# IGARSS 2013

21-26 July 2013

## MELBOURNE

FINAL PROGRAM

# INTERNATIONAL GEOSCIENCE AND REMOTE SENSING SYMPOSIUM

IEEE

IEEE GRSS Geoscience and Remote Sensing Society

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RESEARCH SCHOOL OF ASTRONOMY & ASTROPHYSICS

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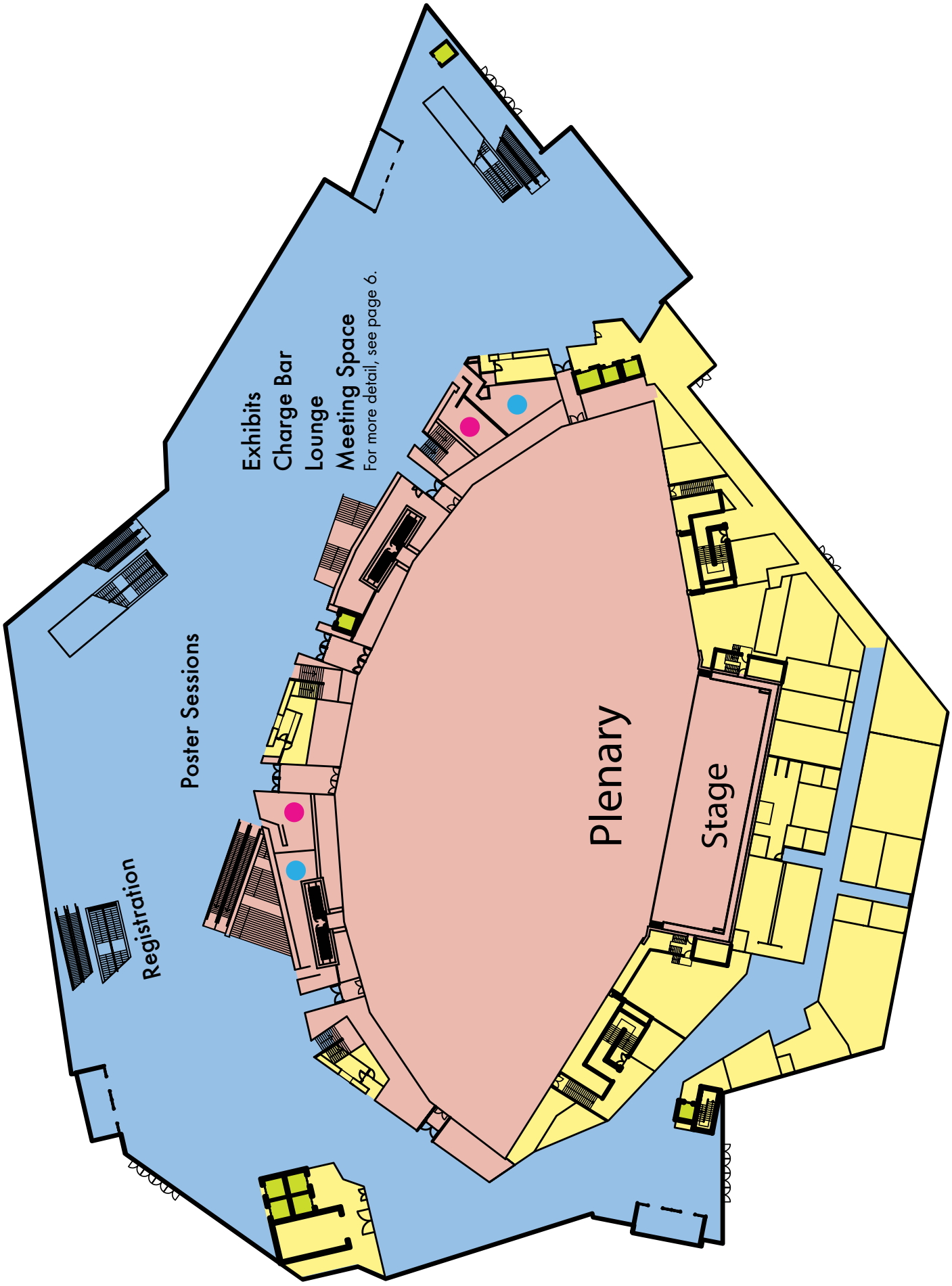
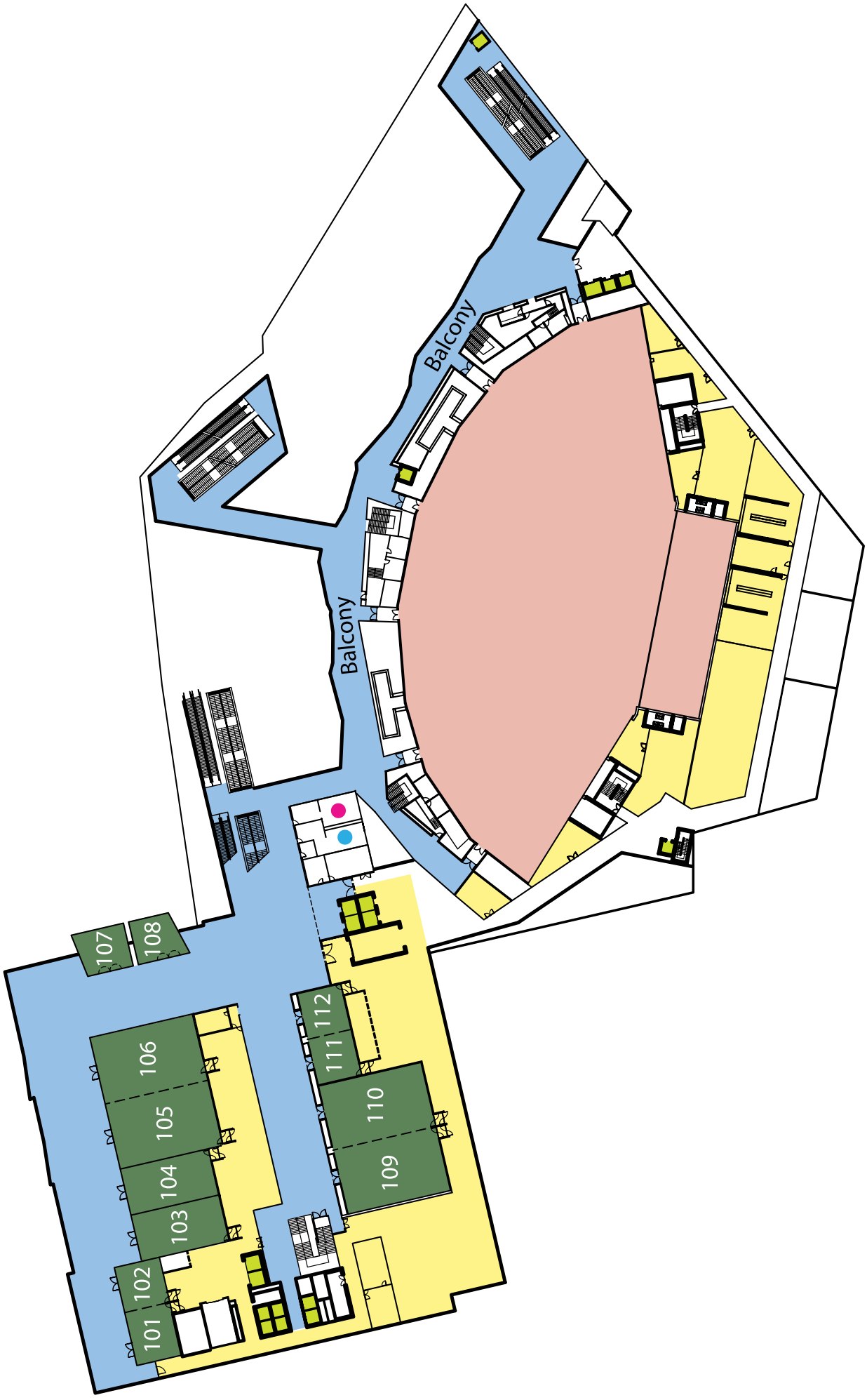
## Melbourne Convention and Exhibition Centre (MCEC) Area Map

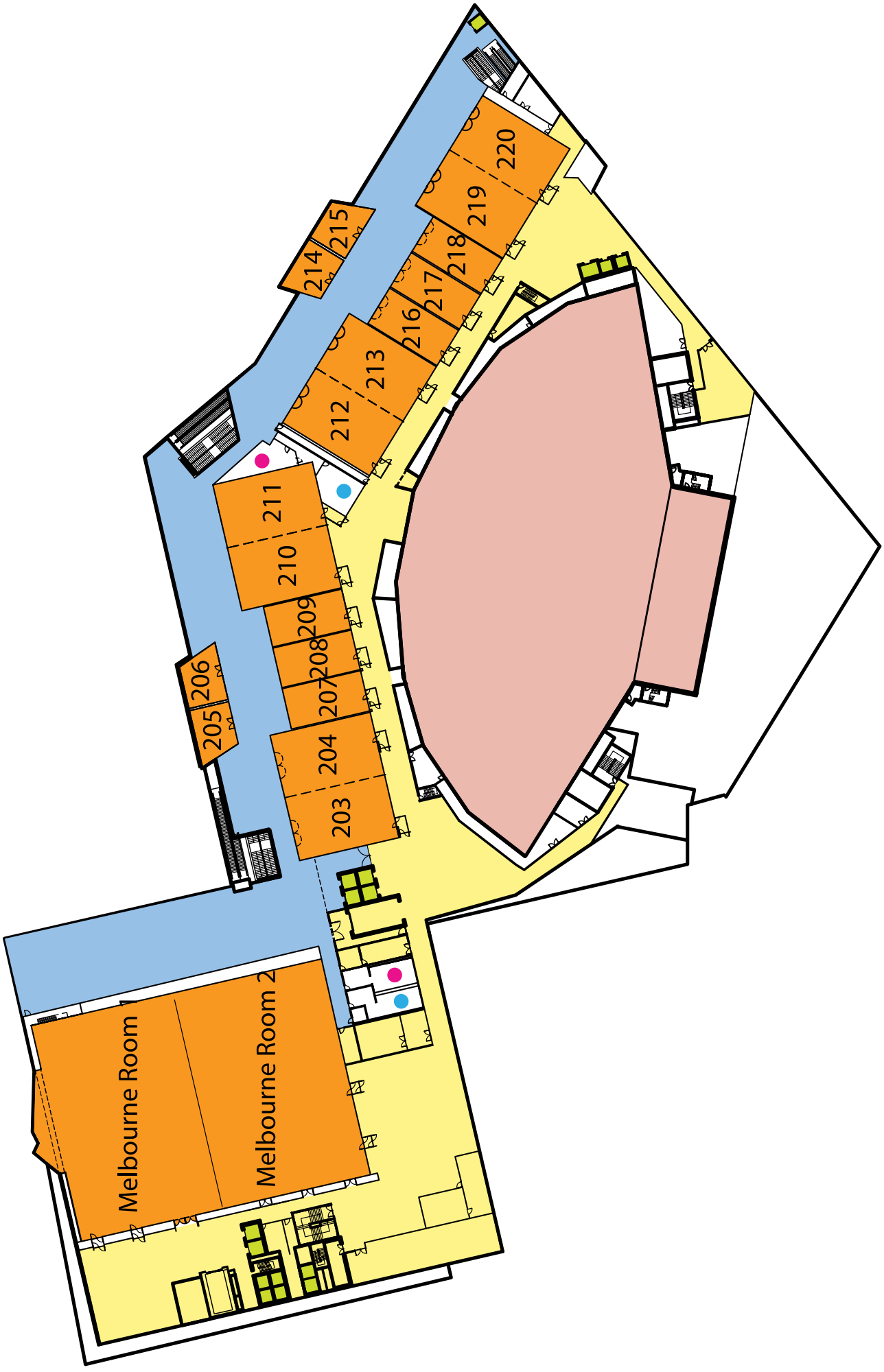
## Venue Map: MCEC Ground Floor — Plenary Session, Exhibits, Poster Sessions



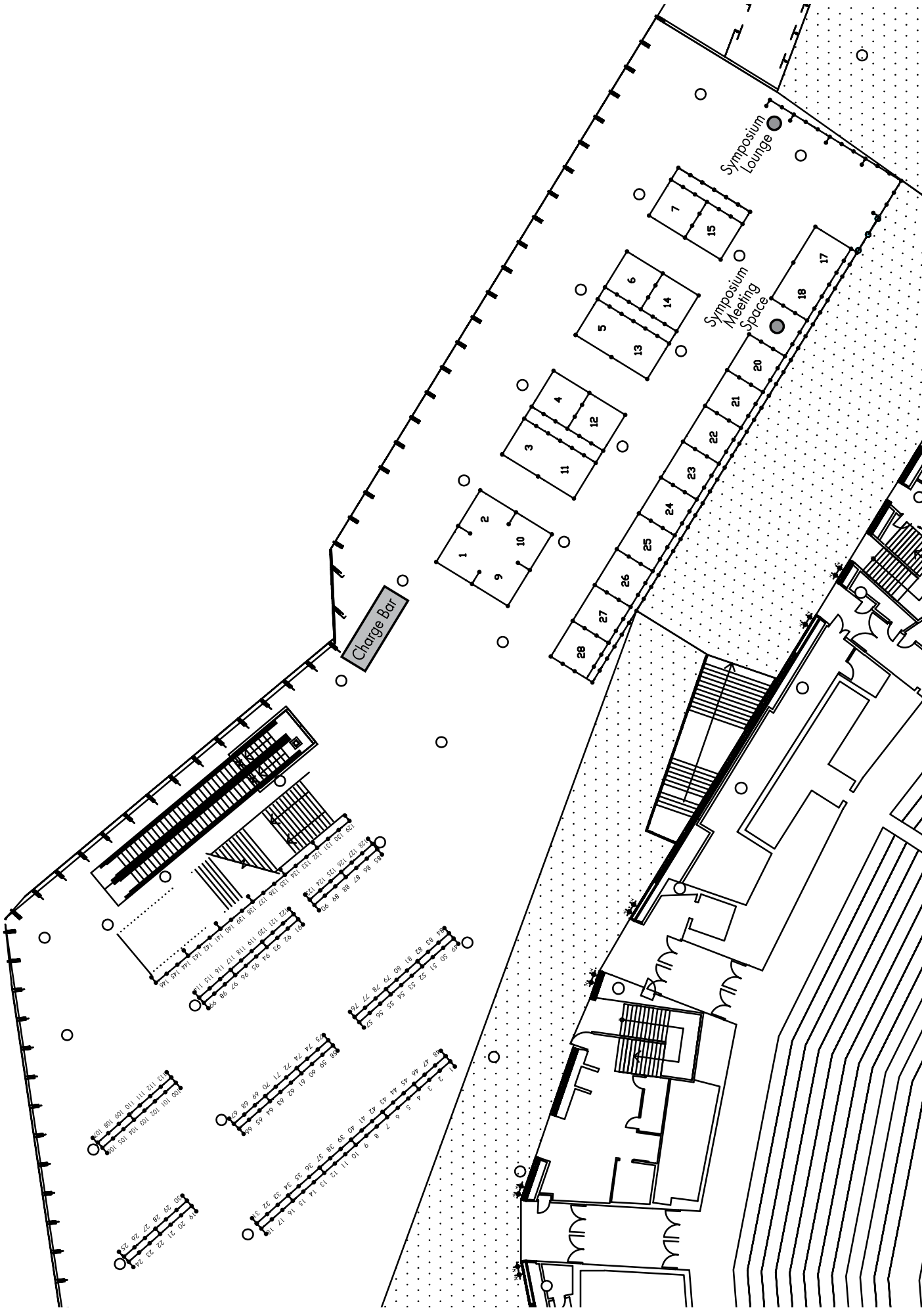
## Venue Map: MCEC Level 1 — Oral Sessions, Tutorials



## Venue Map: MCEC Level 2 — Oral Sessions



**MCEC Ground Floor Foyer — Poster and Exhbits Detailed Map**



## Notes

# Technical Program Overview - Tutorials, Plenary and Oral Sessions

## Sunday, July 21 - Tutorials

| | Room 105 | Room 106 | Room 103 | Room 104 | Room 102 | |
|---|---|---|---|---|---|---|
| 09:00 - 17:00 | FD-1: Advanced Classification Techniques for Remote Sensing | FD-2: Earth Observation Data Mining: Spatio-temporal Patterns Discovery in Heterogenous Data | FD-3: Introduction to Radar Interferometry and its Applications | FD-5: Recent Advances in Hyperspectral Data Analysis | FD-6: Remote Sensing with Reflected Global Navigation Satellite System (GNSS-R) Signals | |

| | Room 101 | | | | | |
|---|---|---|---|---|---|---|
| 09:00 - 12:30 | HD-2: Nonlinear Unmixing of Hyperspectral Data | | | | | |
| 12:30 - 13:30 | Lunch Break | | | | | |
| 13:30 - 17:00 | HD-3: 3D and 4D SAR Tomography: From Basics to Applications | | | | | |
| 18:00 - 19:30 | Welcome Reception – MCEC Exhibition Area | | | | | |

## Monday, July 22 - Plenary and Oral Sessions

| | | | | | | |
|---|---|---|---|---|---|---|
| 09:00 - 12:50 | Opening and Plenary Session – Plenary Hall 3 | | | | | |
| 12:50 - 13:30 | Lunch Break | | | | | |
| | Room 101 | Room 102 | Room 103 | Room 104 | Room 105 | Room 106 |
| 13:30 - 15:10 | MO3.T02<br>Education and Remote Sensing | MO3.T10<br>Extra-terrestrial Geoscience and Remote Sensing | MO3.T03<br>NASA Soil Moisture Active Passive Mission (SMAP) | MO3.T04<br>Tomography and 3D Mapping I | MO3.T11<br>Novel Approaches to Remote Sensing | MO3.T05<br>Differential SAR Interferometry I |
| 15:10 - 15:40 | Break | | | | | |
| 15:40 - 17:20 | | MO4.T12<br>Coastal Hazards and Landslides | MO4.T03<br>Soil Moisture: Retrieval Algorithms I | MO4.T04<br>Multidimensional SAR Imaging Techniques | MO4.T11<br>Allocations in Remote Sensing and RFI Mitigation for Microwave Radiometry | MO4.T05<br>Differential SAR Interferometry II |
| 17:30 - 18:30 | Meeting: Data Archiving and Distribution Technical Committee – Room 208 | | | | | |
| 17:30 - 18:30 | Meeting: Frequency Allocations in Remote Sensing Technical Committee – Room 105 | | | | | |
| 17:20 - 19:00 | Poster Sessions - Ground Floor Foyer | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 09:00 - 12:30 | Opening and Plenary Session – Plenary Hall 3 | | | | | |
| 12:30 - 13:30 | Lunch Break | | | | | |
| | Room 109 | Room 110 | Room 111 | Room 112 | Room 207 | Room 208 |
| 13:30 - 15:10 | MO3.T07<br>Forest Structure I | MO3.T06<br>High Resolution Optical Techniques I | MO3.T08<br>Sea Ice I | MO3.T01<br>Geoscience and Remote Sensing in Australasia and Oceania I | MO3.T12<br>Geohazard Supersites and Natural Laboratories | MO3.T09<br>Ocean Biology |
| 15:10 - 15:40 | Break | | | | | |
| 15:40 - 17:20 | MO4.T07<br>Forest Structure II | MO4.T06<br>High Resolution Optical Techniques II | MO4.T08<br>Ice Sheets and Glaciers I | MO4.T01<br>Big Data and Geoinformation Analytics I | MO4.T10<br>Ground Measurements for Improving Satellite Precipitation Algorithms | MO4.T02<br>Ensuring Credibility of Remote Sensing Data Products |
| 17:30 - 18:30 | Meeting: Data Archiving and Distribution Technical Committee – Room 208 | | | | | |
| 17:30 - 18:30 | Meeting: Frequency Allocations in Remote Sensing Technical Committee – Room 105 | | | | | |
| 17:20 - 19:00 | Poster Sessions - Ground Floor Foyer | | | | | |

## Technical Program Overview - Oral Sessions

### Tuesday, July 23

| | Room 101 | Room 102 | Room 103 | Room 104 | Room 105 | Room 106 |
|---|---|---|---|---|---|---|
| **08:20 - 10:00** | TU1.T10<br>Tropical Rainfall Measurement Mission I | TU1.T12<br>Hazard/Disaster Mapping | TU1.T03<br>Soil Moisture: Retrieval Algorithms II | TU1.T04<br>Advanced Methods for Polarimetric Information Extraction | TU1.T11<br>Local and Regional Applications of Integrated In-situ and Remote Sensing Data III | TU1.T05<br>Differential SAR Interferometry III |
| **10:00 - 10:30** | Break | | | | | |
| **10:30 - 12:10** | Special Session: Developing SAR for Australia's Earth Observation Needs I | TU2.T12<br>Earthquakes and Crustal Movement | TU2.T03<br>Soil Moisture: Downscaling Approaches | TU2.T01<br>GIS Applications I | TU2.T11<br>GCOM-Global Change Observation Mission | TU2.T05<br>High Resolution SAR I |
| **12:10 - 13:30** | Lunch Break | | | | | |
| **12:10 - 13:30** | Young Professionals Lunch – Room 210 | | | | | |
| **13:30 - 15:10** | Special Session: Developing SAR for Australia's Earth Observation Needs II | TU3.T12<br>Tsunamis & Flooding | TU3.T03<br>Soil Moisture: Field Experiments | TU3.T01<br>Local and Regional Applications of Integrated In-situ and Remote Sensing Data I | TU3.T11<br>Remote Sensing Instruments and Technologies for Small Satellites I | TU3.T05<br>High Resolution SAR II |
| **15:10 - 15:40** | Break | | | | | |
| **15:40 - 17:20** | TU4.T09<br>Ocean Temperature and Salinity I | TU4.T12<br>Volcanism | TU4.T03<br>Soil Moisture: Radar Parameters | TU4.T01<br>Local and Regional Applications of Integrated In-situ and Remote Sensing Data II | TU4.T02<br>Pansharpening and Image Processing | TU4.T05<br>Airborne SAR |
| **17:20 - 19:00** | Poster Sessions - Ground Floor Foyer | | | | | |
| **17:30 - 18:30** | Meeting: Data Fusion Technical Committee – Room 207 | | | | | |
| **17:30 - 18:30** | Meeting: Instrumentation and Future Technologies Technical Committee – Room 208 | | | | | |
| **17:30 - 19:00** | Women in Engineering Reception – Room 108 | | | | | |
| **19:00 - 20:30** | Melbourne Aquarium Reception – Melbourne Aquarium , Corner of King and Flinders Street Melbourne (short walk from the MCEC) | | | | | |

| | Room 109 | Room 110 | Room 111 | Room 112 | Room 207 | Room 208 |
|---|---|---|---|---|---|---|
| **08:20 - 10:00** | TU1.T07<br>Forest Biomass I | TU1.T06<br>Hyperspectral Classification I | TU1.T02<br>Student Paper Contest I | TU1.T01<br>Use Cases and the Development of Digital Earth | TU1.T08<br>Active/Passive Microwave Remote Sensing of Terrestrial Snow | TU1.T09<br>Satellite Sensing of Oceans Winds |
| **10:00 - 10:30** | Break | | | | | |
| **10:30 - 12:10** | TU2.T07<br>Forest Biomass II | TU2.T06<br>Hyperspectral Classification II | TU2.T02<br>Student Paper Contest II | TU2.T08<br>Snow Remote Sensing I | TU2.T04<br>Temporal Decorrelation and Repeat-Pass Interferometry Over Forests | TU2.T09<br>Ocean Winds: Hurricane Studies and Climate Applications |
| **12:10 - 13:30** | Lunch Break | | | | | |
| **12:10 - 13:30** | Young Professionals Lunch – Room 210 | | | | | |
| **13:30 - 15:10** | TU3.T07<br>Forests I | TU3.T06<br>Hyperspectral Target/Anomaly Detection | TU3.T10<br>Global Precipitation Measurement II | TU3.T08<br>Snow Remote Sensing II | TU3.T04<br>Data Fusion I | TU3.T09<br>Ocean Currents and Waves Dynamics |
| **15:10 - 15:40** | Break | | | | | |
| **15:40 - 17:20** | TU4.T07<br>Forests II | TU4.T06<br>Hyperspectral Noise Reduction | TU4.T10<br>Global Precipitation Measurement III | TU4.T08<br>Future Missions and Systems | TU4.T04<br>Data Fusion II | TU4.T11<br>Remote Sensing Instruments and Technologies for Small Satellites II |
| **17:20 - 19:00** | Poster Sessions - Ground Floor Foyer | | | | | |
| **17:30 - 18:30** | Meeting: Data Fusion Technical Committee – Room 207 | | | | | |
| **17:30 - 18:30** | Meeting: Instrumentation and Future Technologies Technical Committee – Room 208 | | | | | |
| **17:30 - 19:00** | Women in Engineering Reception – Room 108 | | | | | |
| **19:00 - 20:30** | Melbourne Aquarium Reception – Melbourne Aquarium , Corner of King and Flinders Street Melbourne (short walk from the MCEC) | | | | | |

# Technical Program Overview - Oral Sessions

## Wednesday, July 24

| 08:30 - 17:30 | Room 101 | Room 102 | Room 103 | Room 104 | Room 105 | Room 106 |
|---|---|---|---|---|---|---|
| 12:10 - 13:30 | Technical Site Tour - Bushfire Region – Bus departs from MCEC South Wharf/Hilton Entrance at 08:30. Returns to MCEC at 17:30 | | | | | |
| 08:20 - 10:00 | WE1.T09<br>Aquarius Mission Calibration/Validation and Science Results I | WE1.T12<br>Dynamics of Earth Processes and Climate Change - Biosphere/Cryospheres | WE1.T03<br>Soil Moisture: Satellite Products | WE1.T01<br>Sub-orbital Microwave Radiometers | WE1.T02<br>Change Detection | WE1.T05<br>SAR Target Detection and Recognition |
| 10:00 - 10:30 | Break | | | | | |
| 10:30 - 12:10 | WE2.T09<br>Aquarius Mission Calibration/Validation and Science Results II | WE2.T12<br>Dynamics of Earth Processes and Climate Change - Hydrosphere | WE2.T03<br>Soil Moisture: Data Assimilation | WE2.T01<br>Synthetic Aperture Microwave Radiometry and Radio-Frequency Interference Detection and Mitigation | WE2.T02<br>Multi and Hyperspectral Image Analysis | WE2.T05<br>SAR Processing II |
| 12:10 - 13:30 | Lunch Break | | | | | |
| 12:10 - 13:30 | Editors Lunch – Room 205 | | | | | |
| 13:30 - 15:10 | | WE3.T12<br>Dynamics of Earth Processes and Climate Change - Atmosphere | WE3.T11<br>RADARSAT | WE3.T01<br>Recent Technology Developments in Microwave Radiometry | WE3.T02<br>SAR Image Analysis I | WE3.T05<br>SAR Interferometry II |
| 15:10 - 15:40 | Break | | | | | |
| 15:40 - 17:20 | | WE4.T12<br>Surface Deformation in Volcanic and Seismogenic Areas by means of Advanced Remote Sensing Techniques I | WE4.T11<br>TanDEM-X: Mission Status and Science Activities | WE4.T01<br>Microwave Radiometer Calibration and Validation | WE4.T02<br>SAR Image Analysis II | WE4.T05<br>SAR Interferometry III |
| 17:20 - 19:30 | Poster Sessions – Ground Floor Foyer | | | | | |
| 17:30 - 18:30 | Meeting: International Spaceborne Imaging Spectroscopy Technical Committee – Room 101 | | | | | |
| 18:15 - 23:15 | IGARSS Futsal Soccer Game – North Melbourne Recreation Centre; Bus departs from MCEC South Wharf/Hilton Entrance at 17:30. Return bus departs soccer ground at 23:00 | | | | | |
| 19:00 - 21:00 | Technical Committee & Chapter Chairs Dinner – Room 210 | | | | | |

| | Room 109 | Room 110 | Room 111 | Room 112 | Room 207 | Room 208 |
|---|---|---|---|---|---|---|
| 12:10 - 13:30 | Technical Site Tour - Bushfire Region – Bus departs from MCEC South Wharf/Hilton Entrance at 08:30. Returns to MCEC at 17:30 | | | | | |
| 08:20 - 10:00 | WE1.T07<br>Field Sampling and Remote Sensing | WE1.T06<br>Spectral Unmixing | WE1.T10<br>Precipitation and Clouds II | WE1.T08<br>Remote Sensing of the Littoral Zone with Electro-optical Sensors I | WE1.T04<br>SAR Polarimetry: Theory and Applications I | WE1.T11<br>ALOS Follow-on Optical Mission: High Spatial/ Spectral Resolution Global Observation |
| 10:00 - 10:30 | Break | | | | | |
| 10:30 - 12:10 | WE2.T07<br>Vegetation I | WE2.T06<br>Machine Learning in Hyperspectral Imagery | WE2.T10<br>Precipitation and Clouds III | WE2.T08<br>Remote Sensing of the Littoral Zone with Electro-optical Sensors II | WE2.T04<br>SAR Polarimetry: Theory and Applications II | WE2.T11<br>ALOS-2 |
| 12:10 - 13:30 | Lunch Break | | | | | |
| 12:10 - 13:30 | Editors Lunch – Room 205 | | | | | |
| 13:30 - 15:10 | WE3.T07<br>Vegetation II | WE3.T06<br>Applications of Hyperspectral Sensing | WE3.T10<br>Aerosols and Atmospheric Chemistry II | WE3.T03<br>Recent Advances in Land Surface Data Assimilation | WE3.T04<br>Signal Processing Techniques for POL-SAR and POL-inSAR Applications I | WE3.T09<br>Coastal Oceanography II |
| 15:10 - 15:40 | Break | | | | | |
| 15:40 - 17:20 | WE4.T07<br>Vegetation III | WE4.T03<br>Remote Sensing for Water Resources | WE4.T10<br>Numerical Weather Prediction and Data Assimilation II | WE4.T08<br>New SAR Missions | WE4.T04<br>Signal Processing Techniques for POL-SAR and POL-inSAR Applications II | WE4.T09<br>Radar in Coastal Oceanography |
| 17:20 - 19:30 | Poster Sessions – Ground Floor Foyer | | | | | |
| 17:30 - 18:30 | Meeting: International Spaceborne Imaging Spectroscopy Technical Committee – Room 101 | | | | | |
| 18:15 - 23:15 | IGARSS Futsal Soccer Game – North Melbourne Recreation Centre | | | | | |
| 19:00 - 21:00 | Technical Committee & Chapter Chairs Dinner – MCEC | | | | | |

## Technical Program Overview - Oral Sessions

### Thursday, July 25

| | Room 101 | Room 102 | Room 103 | Room 104 | Room 105 | Room 106 |
|---|---|---|---|---|---|---|
| **08:20 - 10:00** | TH1.T09<br>Topography, Geology and Geomorphology I | TH1.T12<br>Surface Deformation in Volcanic and Seismogenic Areas by means of Advanced Remote Sensing Techniques II | TH1.T08<br>TanDEM-X Applications | TH1.T06<br>Optical and Infrared Modelling II | TH1.T02<br>SAR Image Analysis III | TH1.T05<br>Along Track SAR Inteferometry |
| **10:00 - 10:30** | Break | | | | | |
| **10:30 - 12:10** | TH2.T09<br>Wetlands I | TH2.T12<br>Topography, Geology & Geomorphology | TH2.T08<br>Information Extraction for Scene Interpretation | TH2.T06<br>Optical and Infrared Modelling III | TH2.T02<br>Statistical and Machine Learning Techniques | TH2.T05<br>PolSAR Methods |
| **12:10 - 13:30** | Lunch Break | | | | | |
| **13:30 - 15:10** | TH3.T04<br>Integrated Earth Observing Systems II | TH3.T12<br>Earth Deformation Mapping | TH3.T08<br>Information Extraction from SAR Images | TH3.T06<br>Optical and Infrared Modelling IV | TH3.T02<br>Image Classification I | TH3.T05<br>PolSAR Applications |
| **15:10 - 15:40** | Break | | | | | |
| **15:40 - 17:20** | | TH4.T09<br>Recent Advances in Ocean Altimetry | TH4.T08<br>Information Extraction for Soil and Vegetation | TH4.T06<br>TIR Hyperspectral Remote Sensing for the Geosciences | TH4.T02<br>Image Classification II | TH4.T05<br>Polarimetric Decomposition Techniques |
| **17:20 - 19:00** | Poster Sessions - Ground Floor Foyer | | | | | |
| **19:00 - 23:00** | Symposium Dinner – Plaza Ballroom | | | | | |

| | Room 109 | Room 110 | Room 111 | Room 112 | Room 207 | Room 208 |
|---|---|---|---|---|---|---|
| **08:20 - 10:00** | TH1.T07<br>Agriculture: Active Remote Sensing for Crop Properties | TH1.T01<br>Land Cover Change: Global and Regional Mapping | TH1.T10<br>Atmospheric Sounding - Spaceborne | TH1.T03<br>SMOS New Application and Basic Research Results I | TH1.T04<br>Change Detection and Multi-temporal Image Analysis I | TH1.T11<br>Spaceborne Imaging Spectroscopy Missions - Current and Future Activities I |
| **10:00 - 10:30** | Break | | | | | |
| **10:30 - 12:10** | TH2.T07<br>Agriculture: Remote Sensing of Vegetation Properties II | TH2.T01<br>Land Cover Change: Urban | TH2.T10<br>Atmospheric Sounding - Airborne and In-Situ | TH2.T03<br>SMOS New Application and Basic Research Results II | TH2.T04<br>Change Detection and Multi-temporal Image Analysis II | TH2.T11<br>Spaceborne Imaging Spectroscopy Missions - Activities & Calibration |
| **12:10 - 13:30** | Lunch Break | | | | | |
| **13:30 - 15:10** | TH3.T07<br>Agriculture: Remote Sensing of Vegetation Properties III | TH3.T01<br>Land Cover Change: Optical | TH3.T10<br>Lidars and Forestry | TH3.T03<br>SMOS New Application and Basic Research Results III | TH3.T11<br>Next Generation Radar Instruments and Technologies for Future Missions and Mission Concepts I | TH3.T09<br>New Developments in Monitoring of Ocean Surface Features with Spacebourne SAR |
| **15:10 - 15:40** | Break | | | | | |
| **15:40 - 17:20** | TH4.T07<br>Agriculture: Remote Sensing of Land and Water Management II | TH4.T01<br>Land Cover Change: Radar | TH4.T10<br>Lidars and Environment | TH4.T03<br>SMOS New Application and Basic Research Results IV | TH4.T04<br>Super-pixel Based Image Processing and Classification | TH4.T12<br>Subsurface Sensing I |
| **17:20 - 19:00** | Poster Sessions - Ground Floor Foyer | | | | | |
| **19:00 - 23:00** | Symposium Dinner – Plaza Ballroom | | | | | |

## Technical Program Overview - Oral Sessions

### Friday, July 26

| | Room 101 | Room 102 | Room 103 | Room 104 | Room 105 | Room 106 |
|---|---|---|---|---|---|---|
| **08:20 - 10:00** | | FR1.T12<br>Subsurface Sensing II | FR1.T08<br>Information Extraction for Change Detection | FR1.T03<br>High Resolution Remote Sensing for Environmental Monitoring | FR1.T02<br>Hyperspectal Image and Signal Processing | FR1.T05<br>Polarimetric Statistical Analysis and Modelling |
| **10:00 - 10:30** | Break | | | | | |
| **10:30 - 12:10** | | | FR2.T08<br>3D Information Extraction in Urban Data Sets | FR2.T04<br>Microwave Interaction with Soil, Vegetation & Ocean Surface | FR2.T02<br>Image Processing I | FR2.T05<br>Interferometric and Polarimetric Techniques |
| **12:10 - 13:30** | Lunch Break | | | | | |
| **13:30 - 15:10** | FR3.T03<br>Remote Sensing from Unmanned Aerial Vehicles and Systems | FR3.T01<br>Forest Degradation II | FR3.T08<br>2D Information Extraction in Urban Data Sets | FR3.T04<br>Microwave Interaction with Natural Media | FR3.T02<br>Image Processing II | FR3.T05<br>Bistatic SAR II |
| **15:10 - 15:40** | Break | | | | | |
| **15:40 - 17:20** | FR4.T03<br>Ground-based Sensor Systems | FR4.T12<br>Impact of Remote Sensing Programs II | FR4.T08<br>Information Extraction for Target Detection | FR4.T04<br>Ground Penetration and Target Detection | FR4.T02<br>Image Analysis II | FR4.T05<br>Active Microwave Sensors |

| | Room 109 | Room 110 | Room 111 | Room 112 | Room 207 | Room 208 |
|---|---|---|---|---|---|---|
| **08:20 - 10:00** | FR1.T07<br>Agriculture: Remote Sensing for Crop Classification and Mapping | FR1.T01<br>Land Cover Change: Analysis Techniques I | FR1.T10<br>Space Lidar: Missions, Technologies and Observations | FR1.T06<br>Sensor and Model Synergies I | FR1.T11<br>Spaceborne SAR | FR1.T09<br>The Surface Water and Ocean Topography (SWOT) Mission |
| **10:00 - 10:30** | Break | | | | | |
| **10:30 - 12:10** | FR2.T03<br>Mapping of Soils and Vegetation Using Reflectance and Emittance Spectroscopy | FR2.T01<br>Land Cover Change: Analysis Techniques II | FR2.T07<br>Vegetation Structure from Multi-frequency Measurements | FR2.T06<br>Optical and Hyperspectral Sensors | FR2.T11<br>UAV, Airborne and GB-SAR | FR2.T12<br>Data Management and Systems II |
| **12:10 - 13:30** | Lunch Break | | | | | |
| **13:30 - 15:10** | FR3.T07<br>Urban Remote Sensing II | FR3.T09<br>Pleiades: A Dual Optical Constellation for Submetric Observations: Thematic Space Applications I | FR3.T10<br>Image Information Mining II | FR3.T06<br>Hyperspectral Parameters | FR3.T11<br>Radar Processing and Calibration | FR3.T12<br>Data Management and Systems III |
| **15:10 - 15:40** | Break | | | | | |
| **15:40 - 17:20** | FR4.T07<br>Urban Remote Sensing III | FR4.T01<br>Mapping Contaminated Soils using Imaging Spectroscopy | FR4.T10<br>Image Information Mining III | FR4.T06<br>Calibration and Instruments | FR4.T11<br>Digital Calibration Techniques for Multi-Channel SAR Systems | FR4.T09<br>Pleiades: a Dual Optical Constellation for Submetric Observations: Thematic Space Applications II |

## Technical Program Overview - Poster Sessions

**Monday, July 22**

| | Day Code | Starting Board Number | Session Name |
|---|---|---|---|
| 17:20 - 19:00 | MOP | 1 | SAR Interferometry I |
| | MOP | 9 | Recent Advances in GNSS-R and Synthetic Aperture Microwave Radiometry |
| | MOP | 17 | Microwave Radiometers |
| | MOP | 24 | Hyperspectral Techniques I |
| | MOP | 37 | Optical and Infrared Modelling I |
| | MOP | 45 | Integrated Earth Observing Systems I |
| | MOP | 46 | High Resolution Optical Techniques III |
| | MOP | 52 | Instruments, Calibration and Techniques |
| | MOP | 55 | Lidar Applications |
| | MOP | 59 | Remote Sensing from Airborne Platforms |
| | MOP | 62 | Precipitation and Clouds I |
| | MOP | 68 | Numerical Weather Prediction and Data Assimilation I |
| | MOP | 71 | Atmospheric Sounding |
| | MOP | 73 | Aerosols and Atmospheric Chemistry I |
| | MOP | 76 | Data Management and Systems I |
| | MOP | 79 | Inland Waters I |
| | MOP | 81 | Tomography and 3D Mapping II |
| | MOP | 84 | SAR Processing III |
| | MOP | 86 | SUOMI-NPP |

## ENERGY AND OUR CHANGING PLANET

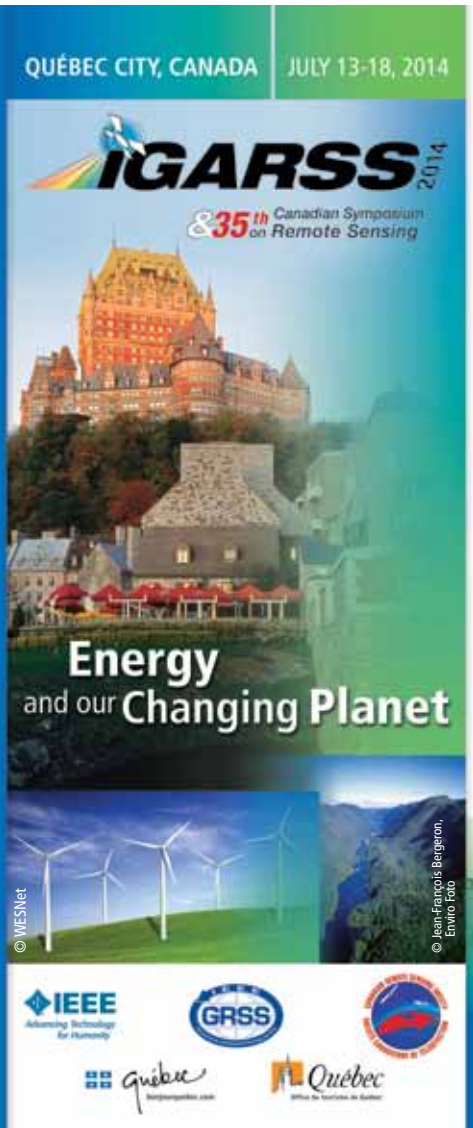
The development of new and renewable sources of energy in the context of a changing planet is a critical and important issue throughout the world. IGARSS 2014 and the 35th Canadian Symposium on Remote Sensing (CSRS) will bring together keynote speakers and will include special sessions dedicated to the "Energy" theme. A student Summer School will also be held the week before the conference.

### The Technical Program will include the following major themes:

- Analysis Techniques and Studies of Cryosphere, Atmosphere, Oceans and Land
- Sensors and Platforms
- Data Management, Dissemination, Education and Policy
- Data Assimilation
- Emerging Space Programs
- Data Fusion and Integration, In Situ Observation and Data Scaling
- Advances in Analysis Techniques

### In addition, the following special themes will be addressed:

- Dynamics of Earth Processes and Climatic Change
- Oil, Gas and Mineral Exploration
- Reservoir Management
- Bioenergy
- Temporal Analysis: Techniques and Applications
- Remote Sensing and Forensic Science
- Remote Sensing in Archeology
- Remote Sensing in Manufacturing Systems (including the forest products industry)
- Robotic Systems in Support of Remote Sensing
- Environmental Remediation and Assessment
- Remote Sensing in Developing Countries




## WELCOME MESSAGE

On behalf of the Local Organizing Committee, it gives us great pleasure to invite you to IGARSS 2014 & 35th CSRS, to be held in the heart of Québec City at the Québec Convention Center from July 13th – July 18th, 2014.

In addition to the technical sessions, IGARSS 2014/35th CSRS will also include tutorials, exhibits, professional and student meetings, a soccer game, an awards banquet and a variety of social events.

Welcome to Québec City in July 2014!

Your hosts:

**General Chair**

**Dr. Monique Bernier**
Institut national de la Recherche Scientifique (INRS)

**Technical Program Co-Chairs**

**Dr. Ellsworth LeDrew**
University of Waterloo

**Dr. Josée Lévesque**
Defence Research and Development Canada

**Dr. Jean-Marc Garneau**
Defence Research and Development Canada (ret)


WWW.IGARSS2014.ORG

## Technical Program Overview - Poster Sessions

**Tuesday, July 23**

| | Day Code | Starting Board Number | Session Name |
|---|---|---|---|
| 17:20 - 19:00 | TUP | 1 | High Resolution SAR III |
| | TUP | 8 | SAR Processing I |
| | TUP | 15 | Differential SAR Interferometry IV |
| | TUP | 18 | Electromagnetic Interactions with Land and Ocean |
| | TUP | 28 | Subsurface Sensing Methods and Systems |
| | TUP | 38 | Hyperspectral Techniques II |
| | TUP | 54 | Information Extraction for Mapping Applications |
| | TUP | 60 | Information Extraction for Land and Maritime Applications |
| | TUP | 66 | Information Extraction in Electromagnetic and Subsurface Problems |
| | TUP | 72 | Ocean Temperature and Salinity II |
| | TUP | 76 | Coastal Oceanography I |
| | TUP | 81 | Coastal Zones I |
| | TUP | 84 | Ocean Color and Water Quality |
| | TUP | 89 | Active and Passive Sensing of Ocean Winds; Wave Fields and Propagation |
| | TUP | 96 | Spaceborne Observations of Hurricanes and Air-Sea Interaction |
| | TUP | 100 | Ocean Altimetry |
| | TUP | 102 | SAR Missions and Calibration |
| | TUP | 106 | Active Microwave Sensors and Calibration |
| | TUP | 112 | Ground-based Radar |
| | TUP | 115 | Big Data and Geoinformation Analytics II |
| | TUP | 125 | Image Information Mining I |
| | TUP | 134 | Dynamics of Earth Processes and Climate Change - Biosphere |
| | TUP | 137 | Dynamics of Earth Processes and Climate Change - Hydrosphere/Geosphere |
| | TUP | 141 | Dynamics of Earth Processes and Climate Change - Biosphere/Atmosphere |

## Technical Program Overview - Poster Sessions

**Wednesday, July 24**

| | Day Code | Starting Board Number | Session Name |
|---|---|---|---|
| 17:20 - 19:00 | WEP | 1 | Polarimetric Decompositions and Classifications |
| | WEP | 5 | Polarimetric Methods and Applications |
| | WEP | 13 | PolSAR Image Analysis |
| | WEP | 15 | Bistatic SAR I |
| | WEP | 19 | Analysis Techniques: Segmentation |
| | WEP | 22 | Image Analysis I |
| | WEP | 35 | Image Processing Techniques |
| | WEP | 48 | Information Extraction in Vegetation Applications |
| | WEP | 58 | Analysis Techniques for Information Extraction |
| | WEP | 60 | Land Cover Change: Regional Applications |
| | WEP | 72 | Soil Moisture Retrieval I |
| | WEP | 86 | Land Cover Change: Analysis Methods |
| | WEP | 92 | Forests and Vegetation |
| | WEP | 104 | Agriculture: Remote Sensing of Vegetation Properties I |
| | WEP | 110 | Agriculture: Remote Sensing of Vegetation Classification and Identification |
| | WEP | 117 | Agriculture: Remote Sensing of Land and Water Management I |

## Technical Program Overview - Poster Sessions

**Thursday, July 25**

| | Day Code | Starting Board Number | Session Name |
|---|---|---|---|
| 17:20 - 19:00 | THP | 1 | SAR: Image Processing Methods |
| | THP | 4 | SAR: Image Processing Applications |
| | THP | 9 | Image Classification III |
| | THP | 12 | Image Processing III |
| | THP | 18 | Snow Remote Sensing III |
| | THP | 22 | Ice Sheets and Glaciers II |
| | THP | 25 | Sea Ice II |
| | THP | 28 | GIS Applications II |
| | THP | 36 | Landslides, Volcanoes and Earthquake |
| | THP | 43 | Water Related Disasters |
| | THP | 46 | Miscellaneous Hazards |
| | THP | 52 | Soil Moisture Retrieval II |
| | THP | 61 | Soil Physical and Chemical Properties |
| | THP | 65 | Wetlands II |
| | THP | 68 | Inland Waters II |
| | THP | 71 | Forests and Vegetation II |
| | THP | 88 | Urban Remote Sensing I |
| | THP | 96 | Forest Degradation I |
| | THP | 99 | Topography, Geology and Geomorphology II |

## IEEE GRSS Membership

Membership in the IEEE GRSS is open to professionals and students with varying degrees of academic accomplishment and work experience. Student memberships in GRSS are extremely economical, and the benefits are the same as regular members. A student member must carry at least 50% of a normal, full time academic program as a registered undergraduate or graduate student in a regular course of study in IEEE designated fields. For professionals interested only in the benefits of GRSS, affiliate membership meets the need. In fact, if you visit the GRSS booth in the exhibition hall, you can sign up for a free 1-year GRSS affiliate membership. Regular memberships in IEEE provide additional benefits including the option to belong to more than one society and receive IEEE benefits such as IEEE Spectrum and insurance or credit cards offered through the organization. Regular members are also eligible for Senior Membership in the IEEE GRSS after ten years of professional experience in the field (including educational experience). Please visit the IEEE GRSS website: http://www.grss-ieee.org to explore details of qualifications and membership opportunities.

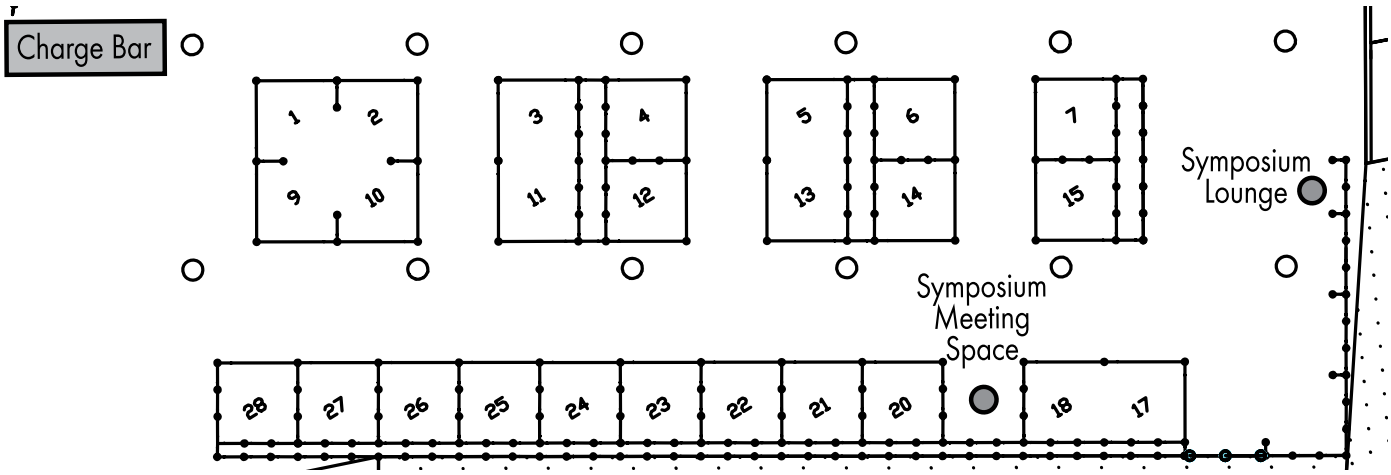
GRSS memberships include on-line access through IEEE Xplore to the Transactions on Geoscience and Remote Sensing (TGRS), Geoscience and Remote Sensing Letters (GRSL) and Journal of Selected Topics in Applied Earth Observations and Remote Sensing (J-STARS). Also online access through IEEE Xplore to all IGARSS Proceedings and selected GRSS sponsored small symposia is available to members for an additional fee of only $4. If you would like to receive printed copies of TGRS, GRSL or J-STARS, you must indicate this on your application form (available on the GRSS website) and pay the additional fee(s) of $56, $30, or $36, respectively. These options are available only for full-year memberships.

The list below is a summary of IEEE and Society Dues.

- For Student, Full, Senior and Fellow GRSS membership grades, you must pay to become an IEEE member and select GRSS as an additional society membership.
- To calculate total dues, you may elect to add the optional printed TGRS, GRSL or J-STARS fee to the appropriate IEEE member fee. (Affiliates select appropriate GRSS Affiliate fee only. No IEEE member fees will be assessed.)
- Applications received between 16 August and 28 February will be processed as full-year memberships. Services begin immediately.
- Applications received between 1 March and 15 August will be processed as half-year memberships expiring 31 December of that calendar year.

| Residence | IEEE GRSS Member Full Year | IEEE GRSS Member Half Year | IEEE GRSS Student Member Full Year | IEEE GRSS Student Member Full Year | GRSS Affiliate Full Year | GRSS Affiliate Half Year |
|---|---|---|---|---|---|---|
| United States | $199 | $100 | $41 | $21 | $81 | $41 |
| Canada | $195 | $98 | $46 | $23 | $81 | $41 |
| Africa, Europe, Middle East | $169 | $85 | $36 | $19 | $81 | $41 |
| Developing Nations e-Membership | $81 | $41 | N/A | N/A | N/A | N/A |
| Latin America | $160 | $80 | $36 | $18 | $81 | $41 |
| Developing Nations e-Membership | $72 | $36 | N/A | N/A | N/A | N/A |
| Asia Pacific | $161 | $81 | $36 | $18 | $81 | $41 |
| Developing Nations e-Membership | $73 | $36 | N/A | N/A | N/A | N/A |

## Exhibition: MCEC Ground Floor Foyer




| | | | | | |
|---|---|---|---|---|---|
| 1,2,9,10 | IEEE Geoscience and Remote Sensing Society | 12 | Cooperative Research Centre for Spatial Information (CRCSI) | 22 | Trimble Navigation, Ltd. |
| 3,11 | Geoscience Australia | 14 | HyVista Corporation Pty Ltd | 23 | AusCover |
| 4 | Fugro Spatial Solutions | 15 | Headwall Photonics, Inc. | 24 | Portable Analytical Solutions |
| 5,13 | The Institute of Remote Sensing and Digital Earth (RADI), Chinese Academy of Sciences | 17,18 | Japan Aerospace Exploration Agency | 25 | Photomapping Services |
| 6 | Spatial Scientific Pty Ltd | 20 | DMC International Imaging Ltd & Surrey Satellite Technology Ltd | 26 | Canadian Space Agency |
| 7 | RapidEye | 21 | Astrium Satellites | 27 | Taylor and Francis |
| | | | | 28 | Esri |

### List of Exhibitors

| | |
|---|---|
| ASTRIUM AN EADS COMPANY | Astrium Satellites<br>Guaranteeing Europe's access to space as the established leader in space transportation, satellite systems and services, Astrium has for over 40 years been dedicated to bring you all the space you need - now and in the future. It is a mission which resonates with many of the most prestigious names in space – Ariane, the International Space Station, Envisat, Mars Express, Skynet 5 ... It is a mission with a consistent commitment, to offer our customers the best possible solutions in the market, with unbeatable levels of, quality, cost-efficiency and schedule adherence. Astrium is a wholly owned subsidiary of EADS, a global leader in aerospace, defence and related services. |
| TERN AusCover | AusCover<br>The AusCover facility provides a national expert network and a data delivery service for provision of Australian biophysical remote sensing data time-series, continental-scale map products, and selected high-resolution data sets over TERN sites. AusCover supports a nationally consistent approach to the delivery and calibration/validation of key current and future core satellite-derived data sets. The primary goal is to assist in the production of ecosystem science data products designed specifically for Australian conditions. This is achieved by connecting relevant remote sensing science groups and their activities, providing infrastructure to make the connection and support data collections, calibration, validation and associated technical documentation. |
| CSA ASC | Canadian Space Agency<br>Established in 1989, the Canadian Space Agency coordinates all civil, space-related policies and programs on behalf of the Government of Canada. The CSA directs its resources and activities through three key Business Lines: Space Utilization, supporting government partners; Space Exploration, positioning Canada as a credible partner in international space exploration missions; and, Space Science and Technology driving capacity building in academia and space industry. By leveraging international cooperation and collaboration, the CSA generates world-class scientific research and industrial development for the benefit of humanity. |
| crc•si | Cooperative Research Centre for Spatial Information (CRCSI)<br>CRCSI conducts user-driven research in emerging areas of spatial information that address issues of national importance. We also perform commissioned research projects for key clients. Our partners include federal and state government agencies, universities and 60 companies, cumulatively providing $160 million (cash and inkind) over 2010-18.Our achievements are recognised nationally and internationally. We have an ambitious program of work addressing market failures and supporting critical spatial infrastructure in Australia and New Zealand. |
| dmc International Imaging<br>SURREY SATELLITE TECHNOLOGY LTD | DMC International Imaging Ltd & Surrey Satellite Technology Ltd<br>DMC International Imaging Ltd (DMCii) is one of the world's fastest growing satellite imagery providers. Based in the UK, we have users in 100 countries around the globe, supplying both programmed and archived optical satellite imagery from the multi-satellite, multi-temporal, multi-resolution (2.5m, 5m, 22m, and 32m) DMC constellation. We supply imagery for a wide variety of applications which require large areas to be monitored on a regular basis, including agriculture and forest monitoring, infrastructure planning, disaster monitoring, land cover classification and environmental mapping. DMC 22m coverages of Australia for 2010, 2011 and 2012 are available through Geoscience Australia with Creative Commons licensing. Full 2013 archive coverage of Australia and mutitemporal satellite programming is available through DMCii, along with imagery for the rest of the world. |
| esri | Esri<br>Esri's GIS technology enables organizations to effectively analyze and manage their geographic and imagery information to make better decisions. Organizations are supported by experienced, knowledgeable staff and an extensive network of business partners and international distributors. |
| FUGRO | Fugro Spatial Solutions<br>Fugro Spatial Solutions brings together a wealth of experience of over 40 years in the spatial industry, specialising in the provision of survey, remote sensing and spatial services to our clients. Fugro Spatial Solutions employs over 100 staff with the head office located in Perth, Western Australia and other offices in Brisbane, Queensland, Melbourne, Victoria and regional Western Australia. Fugro Spatial Solutions is a part of the Fugro NV group, a financially sound international organisation that consists of over 13,500 staff around the world. |

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|---|---|
| Australian Government<br>Geoscience Australia | GEOSCIENCE AUSTRALIA<br>Geoscience Australia's National Earth Observation Group provides spatial information to the Australian Government and community to enable informed decisions on key issues such as the environment and community safety. We apply leading-edge processing and scientific analysis to extract and deliver information, contributing to the prosperity and sustainability of the Australian community. We also operate ground stations, manage long-term archives of Earth observation data and distribute satellite data via the Internet. |
| Headwall PHOTONICS | Headwall Photonics, Inc.<br>Headwall is the world's leading designer and manufacturer of spectral imaging instruments for remote sensing and geo-spatial applications. Headwall's products include high performance hyperspectral imagers and Raman imaging sensors which are specifically designed for harsh remote sensing environments. Headwall offers sensors and instrumentation that are space-qualified (UV, VNIR, SWIR) as well as hyperspectral sensors for airborne deployment. These include very compact hyperspectral sensors designed for small, ultralight UAVs and robotic platforms. Headwall's sensors are available for a broad range of spectral imaging ranges and laser excitation wavelengths, including UV, Visible, VNIR, NIR, SWIR, and MWIR. High-performance instruments are made possible by Headwall's ability to design and manufacturer aberration-corrected diffractive optics, which are core components within each sensor. |
| HyVista CORPORATION | HyVista Corporation Pty Ltd<br>The company specializes in the supply of airborne hyperspectral remote sensing data and information products for a wide range of applications covering earth resource mapping, environmental monitoring, agriculture, urban mapping and many research development projects such as simulating future hyperspectral satellites, defense surveillance, soil degredation and species habitat mapping. |
| IEEE GRSS Geoscience and Remote Sensing Society | IEEE Geoscience and Remote Sensing Society<br>The Geoscience and Remote Sensing Society seeks to advance science and technology in geoscience, remote sensing and related fields using conferences, education, and other resources. The fields of interest of the Society are the theory, concepts, and techniques of science and engineering as they apply to the remote sensing of the earth, oceans, atmosphere, and space, as well as the processing, interpretation and dissemination of this information. |
| JAXA Japan Aerospace Exploration Agency | Japan Aerospace Exploration Agency<br>Earth Observation Research Center, Japan Aerospace Exploration Agency (EORC, JAXA) Global change may even menace people's daily lives by generating frequent storms and flood damage such as the mighty typhoons. Since April 1995 when the center was established, we have been calibrating and validating the observed data and the observation instrument for ALOS, GOSAT, TRMM/PR, AQUA/AMSR-E and foreign mission instruments, developing higher-level algorithms, and demonstrating the usefulness of application services by using earth observation data. |
| PHOTOMAPPING | Photomapping Services<br>Photomapping are the mapping and airborne imagery specialists delivering economical spatial solutions. Focusing on acquisition, manipulation, management and presentation of geospatial data. Comprising four aircraft with state of the art Optech LiDAR, Leica ADS80 digital acquisition and Zeiss film cameras. Australia wide film archive from 1930 Five precise scanners. |
| PAS portable analytical solutions | Portable Analytical Solutions<br>Portable Analytical Solutions (PAS) are the Australian, NZ, PNG & Indonesia distributor of NIR ASD spectrometers for remote sensing in a variety of applications including; Minerals Analysis, Forestry & Crops and Soils research. For all Sales, Service and Customer support, contact PAS on (02) 4381 2844. |
| RapidEye Delivering the World | RapidEye<br>RapidEye is a leading provider of quality high-resolution satellite imagery. With a constellation of five Earth Observation satellites, RapidEye images up to five million square kilometers of earth every day, and adds over one billion square kilometers of imagery to its archive every year. Every square kilometer imaged by RapidEye can be browsed with its online discovery tool, EyeFind (eyefind.rapideye.com). With an unprecedented combination of wide area repetitive coverage and five meter pixel size multi-spectral imagery, RapidEye is a natural choice for many industries and governments. RapidEye is headquartered in Berlin, Germany and has additional offices in the US and Canada. www.rapideye.com |
| spatial SCIENTIFIC | Spatial Scientific Pty Ltd<br>Spatial Scientific Pty. Ltd. is a leading provider of airborne thermal imaging, aerial multispectral data and geospatial services to the Australian mining, agricultural, defence and environmental industries. Current clients include multi-national mining companies, environmental consultants, primary producers, government departments, universities and research institutes, and allied industries across Australia. Spatial Scientific has an established track record with over 15 years' experience. The company employs highly skilled engineers and imaging experts who are dedicated to helping clients improve their productivity and profitability. Spatial Scientific prides itself on delivering tailor-made solutions that fit the client's needs. |
| Taylor & Francis Group an informa business | Taylor and Francis<br>Building on two centuries' experience, Taylor & Francis has grown rapidly over the last two decades to become a leading international academic publisher. Operating from a network of 20 global offices, including New York, Oxford, Melbourne, Beijing, New Delhi, Singapore and Tokyo, Taylor & Francis publishes more than 1,700 journals and 1,800 new books each year.<br>Taylor & Francis Group is an Informa business (www.informa.com), with the prestigious "Routledge" imprint applied to our publishing program across the Arts, Humanities and Social Sciences. Through our publishing program, which includes more than 50 Australian edited journals, we are committed to maximising global reach and impact for the many thousands of academics, researchers and professionals who publish with us globally. Details of our publishing program can be found at http://www.tandf.co.uk/ |
| RADI | The Institute of Remote Sensing and Digital Earth (RADI), Chinese Academy of Sciences<br>The Institute of Remote Sengsing and Digital Earth(RADI)is a comprehensive research institute directly under the Chinese Academy of Sciences. The strategic objectives of RADI are to explore leading technologies in Earth observation, geospatial information science, and the mechanisms for acquiring and distributing remote sensing information; focus on the construction and operation of major Earth observation infrastructure and the air-space-ground integrated Earth observation technology system; enhance its capacity for providing resource-environment spatial information at regional and global levels by establishing a digital Earth scientific platform, therefore building itself into a comprehensive, world-class research institute. |
| Trimble | Trimble Navigation, Ltd.<br>Trimble is a leading provider of advanced positioning solutions, application software, wireless communications, and services to increase productivity through positioning. Trimble GNSS Infrastructure provides integrated and proven solutions to enable customers to collect, manage, and analyze complex information faster and easier, making them more productive, efficient and profitable. |

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IGARSS 2013 is sponsored by the Institute of Electrical and Electronics Engineers (IEEE) and the IEEE Geoscience and Remote Sensing Society.

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| esri | Esri's GIS technology enables organizations to effectively analyze and manage their geographic and imagery information to make better decisions. Organizations are supported by experienced, knowledgeable staff and an extensive network of business partners and international distributors.<br>http://esri.com |
| RADI | The Institute of Remote Sensing and Digital Earth, Chinese Academy of The Institute of Remote Sensing and Digital Earth is a comprehensive research institute directly under the Chinese Academy of Sciences. The strategic objectives of RADI are to explore leading technologies in Earth observation, geospatial information science, and the mechanisms for acquiring and distributing remote sensing information; focus on the construction and operation of major Earth observation infrastructure and the air-space-ground integrated Earth observation technology system; enhance its capacity for providing resource-environment spatial information at regional and global levels by establishing a digital Earth scientific platform, therefore building itself into a comprehensive, world-class research institute.<br>http://english.ceode.cas.cn |

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|---|---|
| Australian Government<br>Bureau of Meteorology | The Bureau of Meteorology is Australia's national weather, climate and water agency. Its expertise and services assist Australians in dealing with the harsh realities of their natural environment, including drought, floods, fires, storms, tsunami and tropical cyclones. Satellite remote sensing underpins many of the Bureau's services and the Bureau is one of the largest users of satellite data in the Australian government.<br>http://www.bom.gov.au/ |
| CSIRO | The Commonwealth Scientific and Industrial Research Organisation (CSIRO) is Australia's national science agency and one of the largest and most diverse research agencies in the world. CSIRO has extensive Earth observation capabilities, and is recognised in Australia's Satellite Utilisation Policy as one of three Australian Government agencies jointly responsible for Australia's civilian Earth observations from space (EOS) activities (along with Geoscience Australia and the Bureau of Meteorology).<br>http://crcsi.com.au |
| PAS portable analytical solutions | Portable Analytical Solutions (PAS) are the Australian, NZ, PNG & Indonesia distributor of NIR ASD spectrometers for remote sensing in a variety of applications including; Minerals Analysis, Forestry & Crops and Soils research. For all Sales, Service and Customer support, contact PAS on (02) 4381 2844.<br>http://www.PortableAS.com |
| DigitalGlobe™ | DigitalGlobe is a leading provider of commercial high-resolution earth observation and advanced geospatial solutions that help decision makers better understand our changing planet in order to save lives, resources and time. Sourced from the world's leading constellation, our imagery solutions deliver unmatched coverage and capacity to meet our customers' most demanding mission requirements. Each day customers in defense and intelligence, public safety, civil agencies, map making and analysis, environmental monitoring, oil and gas exploration, infrastructure management, navigation technology, and providers of location-based services depend on DigitalGlobe data, information, technology and expertise to gain actionable insight. DigitalGlobe is a public company listed on the NYSE as DGI, and is headquartered in Longmont, Colorado. In January 2013, DigitalGlobe and GeoEye combined to become one DigitalGlobe, creating a company capable of providing greater value to customers through an integrated constellation and a broader set of products and services. For more information on the combination and its benefits, visit www.digitalglobe.com/combination. DigitalGlobe is a registered trademark of DigitalGlobe. |
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| ST Electronics<br>(Satcom & Sensor Systems)<br>A company of ST Electronics | ST Electronics (Satcom & Sensor Systems) delivers innovative, broadband wireless communication and sensor solutions that enhance connectivity and safety globally. The company also undertakes the design, development and production of advanced satellites for Earth observation applications, and offers a comprehensive suite of remote sensing solutions to customers worldwide. Please visit www.stee.stengg.com. |
| Australian National University<br>RESEARCH SCHOOL OF ASTRONOMY & ASTROPHYSICS | The Advanced Instrumentation and Technology Centre (AITC) at ANU is a national facility that supports the development of precision instruments for astronomy, space and geospatial applications. It offers an end-to-end capability with expertise in the design, manufacture, integration and test of precision instrumentation and complex systems.<br>http://rsaa.anu.edu.au/research/highlights/bigger-better-aitc-were-keeping-australia-space-ready |
| Australian Government<br>Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education | Within the Department of Innovation, the Space Coordination Office is the central point of contact and coordination for all Australia's national and international civil space activities. The Office coordinates the implementation of Australia's Satellite Utilisation Policy and administers the Space Activities Act 1998.<br>http://www.innovation.gov.au/ |
| RMIT UNIVERSITY Geospatial Science | RMIT School of Mathematical and Geospatial Sciences draws together disciplines involving the collection and analysis of data and the understanding and optimisation of systems through modelling and visualisation. The School aims to generate original knowledge in these fields while addressing local and global problems.<br>http://www.rmit.edu.au/mathsgeo |
| MELBOURNE CONVENTION BUREAU | http://www.melbournecb.com.au/ |
| MELBOURNE | http://www.visitmelbourne.com/ |
| GEOSPATIAL media + communications | Geospatial Media & Communications works to initiate a new era of industrialisation of geospatial technology by raising the profile and expanding the horizons of geospatial industry worldwide. It enables the transfer of the value of geospatial technology for the benefit of the world population and for the sustainable development of the planet. Geospatial Media & Communications, through its publications and conferences, creates awareness about geospatial technology; connects the stakeholders; advocates for the right policy environment; and provides an ideal platform for business development activities.<br>http://www.geospatialmedia.net/ |

# Melbourne welcomes you to the IEEE International Geoscience and Remote Sensing Symposium

Once your conference is done for the day, cosmopolitan Melbourne awaits you. Explore this intriguing city where getting lost in a laneway is a highlight; hidden treasures are around each corner and a multitude of festivals will satisfy every one of your senses.

If you have more time on your hands, a visit to regional Victoria unlocks a memory card full of spectacular coastlines, wildlife reserves, award-winning wineries, premier golf courses, and day spas with natural mineral springs.

**For more information on Melbourne's attractions, see**

**visitmelbourne.com**

MELBOURNE

VICTORIA AUSTRALIA

## Welcome to Melbourne

Welcome to Melbourne and the IEEE International Geoscience and Remote Sensing Symposium.

Melbourne is one of the most cosmopolitan and multicultural cities in the world, with 140 nationalities representing 100 religious faiths and 180 different languages. While you are here, please explore the city's range of delights. There is something for everyone; diverse arts and cultural attractions, delightful parks and gardens, exciting entertainment options and a vibrant food and wine culture.

I encourage you to also take the time to enjoy the attractions of regional Victoria; with sweeping coastlines and pristine beaches to national parks, forests teeming with wildlife, wineries, lakes and mountains offering cycling, climbing and hiking. Many of Victoria's unique and varied landscapes are easily accessible as day trips from Melbourne.

I hope that this important and topical gathering provides a platform for the exchange of ideas about best practice here in Victoria, and further afield, and an opportunity to forge new partnerships and friendships. I wish you all the best for a productive Symposium.

Welcome to Melbourne, enjoy the Symposium and please come and visit us again.

THE HON LOUISE ASHER MP
Minister for Innovation, Services and Small Business
Minister for Tourism and Major Events
Minister for Employment and Trade

## Welcome from the IEEE Geoscience and Remote Sending Society President

On behalf of the IEEE Geoscience and Remote Sensing Society, I am delighted to welcome you to IGARSS 2013, and to express our sincere appreciation to the 2013 local team for organizing an outstanding conference. From the plenary session, which includes internationally recognized keynote speakers and celebrates the accomplishments of our members, to the technical program with contributors from more than 65 countries and the unique social events, IGARSS will once again be an outstanding international event for our community.

We are especially appreciative of the extraordinary efforts of Peter Woodgate and Simon Jones, the General Co-Chairs, and their local staff to make IGARSS successful during challenging international times. I also congratulate and offer special thanks to Clive Fraser and Jeff Walker, who have done an outstanding job serving as co-chairs of the IGARSS technical committee. We are also grateful to Xiuping Jia and Kim Lowell, who organized the 2nd GRSS Remote Sensing "Summer" School. (We learned from our southern hemisphere colleagues that a new name may be in order!). The success of IGARSS also depends on the contributions of many people who operate behind the scenes – thanks on behalf of the GRSS to all of you!

The IGARSS reputation is based both on the high quality of the conference and the local "branding" provided by the organizing team. We always anticipate the social programs and opportunities to explore the area, as well as to attend sessions and interact with colleagues. Our Australian colleagues and the city of Melbourne have demonstrated that IGARSS 2013 will definitely be an event to be remembered in this respect as well.

Best regards,
Melba Crawford
President, IEEE GRSS

## Welcome from the General Co-Chairs

On behalf of the IEEE Geoscience and Remote Sensing Society (GRSS) we would like to warmly welcome you to Melbourne for IGARSS 2013 with a heartfelt "G'day"! The Geoscience and Remote Sensing Society was founded 51 years ago and this will be the 33rd annual IGARSS symposium continuing the wonderful tradition of gathering world-class scientists, engineers and educators in the fields of geoscience and remote sensing.

This year the theme is 'Building a sustainable earth through remote sensing'. An outstanding technical program explores the role of satellite, airborne and ground based sensors for atmosphere, cryosphere, oceans and terrestrial systems research. Specialist sessions will be held on sensors and platforms; data management, dissemination, education and policy; data assimilation; emerging space programs; data fusion and integration; in situ observation and data scaling; and advances in analysis techniques.

We welcome all delegates to the opening reception on the evening of Sunday 21 July at the Melbourne Convention and Exhibition Centre. On the morning of Monday 22 July we hold the Opening Plenary. We are delighted and honoured to have as our distinguished guest speakers: Senator the Honourable Kate Lundy, Australia's lead minister for space; IEEE President Dr Peter Staecker; GRSS President Professor Melba Crawford; the Chief Executive of Geoscience Australia Dr Chris Pigram; the Director General of the Remote Sensing and Digital Earth Institute of the Chinese Academy of Sciences Professor Guo Huadong; Emeritus Professor of Geography Mike Goodchild of the University of California, one of the world's leading GIS researchers and thinkers; and Dr Rob Vertessy, Director of the Australian Bureau of Meteorology.

In a comprehensive program running over 8 days, there will be over 1000 oral papers in 12 parallel sessions, over 400 posters, 20 exhibitors, 7 special tutorials, a two day summer school with 9 guest speakers, a full day technical tour to Victoria's beautiful forests in the Central Highlands to visit the communities devastated by the 2009 'Black Saturday' bushfires lead by one of Victoria's former fire chiefs who fought the fires on the day, a Technical Committee and Chapter luncheon, a Women in Engineering reception, a Young Professionals luncheon, the traditional IGARSS soccer game, a reception at the Melbourne Aquarium, and the Annual IGARSS Symposium dinner at the elegant and historic Plaza Ballroom. You will join delegates from over 60 countries for the opportunity to network, catch up with old friends and make new ones, learn and enjoy yourself over the course of the Symposium.

On behalf of our Organising Committee of 30 dedicated volunteers from all over Australia and the world we are delighted to welcome you to marvellous, cosmopolitan and gracious Melbourne.

Best wishes for a wonderful IGARSS 2013!

**Simon Jones and Peter Woodgate**
General Co-Chairs
IGARSS 2013, Melbourne
July 2013

## Technical Program Overview

The Technical Programme Committee (TPC) takes great pleasure in welcoming you all to IGARSS 2013, and in presenting to you the technical programme that we have helped construct from over 1900 high-quality submissions this year.

Before describing this year's programme it is only fitting that we begin by thanking the thousand-strong army of volunteer reviewers whose contribution of time and effort has ensured that the papers accepted to the conference are original, technically correct, accessible and relevant. Following the review process, the 100-strong TPC met in Los Angeles in March 2013 to construct a technical programme that reports leading-edge developments in sensor technologies, methodologies and applications in geoscience and remote sensing, and that reflects the current concerns regarding climate, resources and hazards in the global community.

Despite Australia's location, and the difficulties associated with the US Sequestration, it has been necessary to expand to 12 parallel sessions, from the 10 planned originally, in order to accommodate what promises to be a vibrant symposium. This year the TPC took into account feedback from delegates from previous years by reducing to 27% the fraction of invited papers, and your continued feedback on this and other issues is welcomed.

With six sessions on forests, forests biomass and forest structure, and new sessions on forest degradation and forest temporal decorrelation, the symposium is clearly a significant forum for the increasingly important role of remote sensing in the monitoring of forests. Climate concerns continue to be reflected in the programme with themes on the remote sensing of atmosphere, soil moisture, precipitation, snow cover and of particular note the use of multi-frequency SAR interferometry for ice monitoring.

The conference continues to evolve and expand, and this year we have introduced topical themes on UAV and ground-based SAR systems, the integration of earth observing systems and extra-terrestrial geoscience and remote sensing. In the ascendancy are small satellites, as are big data and the use of GIS for geoscience and remote sensing, and of course this year we have a special focus on remote sensing activity in Australasia and Oceania. In keeping with that theme, the IGARSS 2013 symposium will play host to a special session on "Developing SAR for Australia's Earth Observation Needs", and all delegates with an interest in synthetic aperture radar remote sensing are encouraged to contribute to this important discussion.

As usual the technical programme includes only those posters and presentations for which a presenting author has registered at the time of going to press. In the event of a no-show, we request that presenters keep to the listed time-table to ensure delegates moving between sessions do not miss papers. Any gaps in the programme will provide opportunities for extended discussions lead by the session chairs, whose contribution to the success of the programme is gratefully acknowledged. We would also thank the staff at Conference Management Services (CMS, Inc.) whose unstinting efforts make the organisation of the technical programme possible.

Finally our grateful thanks and best wishes go out to you: the presenters and delegates, without whom there would be no symposium. This is your conference, and your contributions make it the flagship event for remote sensing geoscientists and researchers the world over. We hope you enjoy a most exciting and productive week in Melbourne at IGARSS 2013.

**Clive S. Fraser, Jeff Walker and Mark L. Williams**
Technical Programme Co-Chairs
IGARSS 2013, Melbourne
July 2013

## Opening Session

**08:45** **Welcome to IGARSS 2013**
Simon Jones and Peter Woodgate, General Co-Chairs

**08:55** **Welcome to Country**

**09:05** **Welcome from the Australian Government**
Senator the Honourable Kate Lundy, Minister Assisting for Industry and Innovation, and responsible for developing Australia's satellite utilisation policy

**09:20** **Welcome from IEEE GRS Society**
Melba Crawford, President

**09:30** **Welcome from IEEE**
Peter W. Staecker, IEEE President, 2013

**09:40** **Major Awards and Recognitions**
Electromagnetics Award
Fellow Awards
IEEE GRSS Education Award
Distinguished Achievement Award
GOLD Early Career Award

**10:30** **Break**

## Plenary Session

**11:00** **Dr. Chris Pigram, Chief Executive Officer, Geoscience Australia**

**11:25** **Professor Guo Huadong, Director-General, Institute of Remote Sensing and Digital Earth (RADI)**

**11:50** **Professor Mike Goodchild, University of California Santa Barbara**

**12:15** **Dr Rob Vertessy, Director, Australian Bureau of Meteorology**

## Symposium Introduction

**12:40** **IGARSS 2013 Technical Program**
Clive Fraser, Jeff Walker, Mark Williams, Technical Program Co-Chairs

**12:45** **Closing remarks**
Simon Jones, Peter Woodgate, General Co-Chairs

**12:50** **Lunch**

## Plenary Speakers

Dr. Chris Pigram is Chief Executive Officer of Geoscience Australia. Geoscience Australia is a world leader in providing first class geoscientific information and knowledge enabling the Australian government to make informed decisions about the use and management of resources, the environment, community wellbeing and sustainable energy. Dr Pigram has over 30 years of experience in a wide range of geological research and mapping and has co-authored over 90 publications. He has served on the Australian National Committee for Earth Sciences and is currently the Australian Government representative on the Australian New Zealand Land Information Council. Dr Pigram's talk will crystallize the latest Australian developments in geoscience and remote sensing.

Professor Guo Huadong is Director-General of the Institute of Remote Sensing and Digital Earth (RADI) created from the recent merger of the Centre for Earth Observation and Digital Earth (CEODE) and the Institute of Remote Sensing Applications (IRSA) both of the Chinese Academy of Sciences (CAS). Professor Guo is an Academician of the Chinese Academy of Sciences, Fellow of the Academy of Sciences for the Developing World (TWAS), President of ICSU/CODATA, and Editor-in-Chief of the International Journal for Digital Earth. He has over 30 years' experience in remote sensing applications, specialising in radar and has published over 300 papers and 15 books. Professor Guo will highlight the latest developments in geoscience and remote sensing in the China and Asia-Pacific region.

Professor Mike Goodchild is Emeritus Professor of Geography at the University of California Santa Barbara. He is a Member of the US National Academy of Sciences and a Foreign Member of the Royal Society of Canada, a Foreign Member of the Royal Society and Corresponding Fellow of the British Academy. Professor Goodchild serves on the Editorial Boards of ten journals and book series and has published 15 books and over 500 articles. He is one of the world's pre-eminent thinkers in geographic information sciences and their role in supporting so many other aspects of scientific development. Professor Goodchild will challenge us with his thoughts on the relationship between remote sensing and the broader GIS communities.

Dr. Rob Vertessy is Director of the Australian Bureau of Meteorology. Dr Vertessy has more than 25 years' experience as a senior water scientist and leading researcher including leading the expansion of the Bureau's role in providing the hydrological information central to the delivery of Australian national water reform. Dr Vertessy has previously been the Chief of the CSIRO Land & Water Division and Director of the Cooperative Research Centre for Catchment Hydrology. The Bureau of Meteorology is Australia's national weather, climate and water agency. Its expertise and services assist Australians in dealing with the harsh realities of their natural environment, including drought, floods, fires, storms, tsunami and tropical cyclones. Through regular forecasts, warnings, monitoring and advice spanning the Australian region and Antarctic territory, the Bureau provides one of the most fundamental and widely used services of the Australian government. Dr Vertessy is currently leading a number of ground-breaking initiatives in the use of remote sensing and value-added spatial and information products systems and will speak about these at the Opening Ceremony.

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Alberto Refice
Andreas Reigber
Steven C. Reising
Daniele Riccio
John A Richards
Dar Roberts
Fabio Rocca
Ernesto Rodriguez
Filomena Romano

Roland Romeiser
Chris R. Rose
Jens Rosebrock
Paul Rosen
Philip W Rosenkranz
Helmut Rott
Jean-Louis Roujean
Christoph Rudiger
Paula Saameno
Behara Seshadri Daya Sagar
Albane Saintenoy
Yuji Sakuno
Mercedes Salvia
Pier Francesco Sammartino
Melody Sandells
Veronica Santalla del Rio
Emanuele Santi
Kamal Sarabandi
Jose Saraiva
Makoto Satake
Dinesh Sathyamoorthy
Ryoichi Sato
Michael Schaepman
Rolf Scheiber
Bernd Scheuchl
Paul Scheunders
Gilda Schirinzi
Marcus Schwaebisch
Gottfried Schwarz
Massimo Sciotti
Klaus Scipal
Guadalupe Sepulcre-Canto
Michael Seymour
Jie Shan
Yuanzheng Shao
Nimmi C. Parikh Sharma
Joseph Shaw
Hui Shen
Jiancheng Shi
Yosio Edemir Shimabukuro
Masanobu Shimada
Michal Shimoni
Fridon Shubitidze
Jean-Robert Simard
Anita Simic
Elizabeth L. Simms
Steven Simske
Upendra Singh
Vern Singhroy
Gail Skofronick-Jackson
Henning Skriver
Mark Sletten
David Small
Paul Snoeij
Jose A. Sobrino
Francesco Soldovieri
Raffaele Solimene
Chiara Solimini
Domenico Solimini
Lin-Ping Song
Shuli Song
Jean-Claude Souyris
Satish Srivastava
Nick Stacy
Karl Staenz
Michael Starek
Demetris Stathakis
James Stiles
Uwe Stilla
Erich Stocker
Ad Stoffelen
Tazio Strozzi
Hongbo Su
Lihong Su
Martin Suess
Guoqing Sun
Qiang Sun
Wenbo Sun
Robert Sundberg
Shinichi Suzuki
John J Szymanski
Kaoru Tachiiri
Takeo Tadono
Tetsuya Tagawa
Wataru Takeuchi
Kevin Tansey
Yuliya Tarabalka
Stefano Tebaldini
Fernando Lisboa Teixeira
Miguel Archanjo Telles
Joseph Tenerelli
Ana Claudia Teodoro
John B Theocharis
Christian Thiel
Christian Thom
Werner Peter Thomas
Kurt Thome
Alan Thompson
Francesca Ticconi
Curt Tilmes
James C. Tilton
Saibun Tjuatja
Mitsuhiro Tomosada
Hüseyin Topan
Francesc Torres
Peter Torrione
Ridha Touzi
Robert Treuhaft
Emmanuel Trouvé
Maria Tsakiri
Leung Tsang
Yi-Hsing Tseng
Florence Tupin
Ahmet Serdar Turk
Yu-Chang Tzeng
Kalum Priyanath Udagepola
Cem Unsalan
Kuniaki Uto
David Valencia
Andrea Vallecchi
Mercedes Vall-llossera
Enric Valor
Jan Van Aardt
Douglas Vandemark
Gabriel Vasile
Sivakumar Venkataraman
Frank Veroustraete
Stefano Vignudelli
Alberto Villa
Ivan Esteban Villalon Turrubiates
Anthony Vodacek
Peter Voelger
Michele Volpi
Alexander Voronovich
Slobodan Vucetic
Monica Wachowicz
Wolgang Wagner
Jeffrey Walker
Juliet Wallace
Ingo Walterscheid
Haipeng Wang
Xi Li Wang
Yanting Wang
Yuanyuan Wang
Yunpeng Wang
Zuyuan Wang
Wardoyo Wardoyo
Bjoern Waske
Urs Wegmüller
Matthias Weiß
David Weissman
James West
Dan Johan Weydahl
Jean-Luc Widlowski
Thomas Wilheit
Mark Williams
Mengistu Wolde
Joong Sun Won
Tim Wright
Fan Wu
Hao Wu
Jindong Wu
Hongjie Xie
Xiaoxiong Xiong
Yong Xue
Hiroyoshi Yamada
Yasushi Yamaguchi
Yoshio Yamaguchi
Fumio Yamazaki
Banghua Yan
Kai Yang
Wenli Yang
Zhengwei Yang
Mehmet E Yavuz
Chinatsu Yonezawa
Hiroki Yoshioka
Nicolas Younan
Marwan Younis
Qian Yu
Jinchun Yuan
Peng Yue
Junping Zhang
Lifu Zhang
Xiaoyang Zhang
Yindi Zhao
Jun Zhou
Yaping Zhou
Zheng-Shu Zhou
Xiao Xiang Zhu
Maciel Zortea
Mehrez Zribi

## Social Program

A ticket is required for entry to all social programs and will be included in your registration pack. If you would like to purchase additional tickets to social functions please see the registration desk. If you are unable to attend a social function, please return your ticket to the registration desk.

### Welcome Reception sponsored by CSIRO

Date: Sunday July 21
Time: 18:00 - 19:30
Location: Exhibition Area
Ground Floor
Melbourne Convention and Exhibition Centre
Dress: Smart casual
Cost: Inclusive for delegates registered to attend on Sunday
Additional tickets: $80

Relax and enjoy the company of colleagues and friends at the welcome reception which will be held in the foyer area of the Melbourne Convention and Exhibition Centre. Join us to familiarise yourself with the venue and then enjoy the outstanding food and wine Melbourne has to offer.

### Young Professionals Luncheon

Date: Tuesday July 23
Time: 12:10 - 13:20
Location: Meeting Room 210
Melbourne Convention & Exhibition Centre
Dress: Smart casual
Cost: $20

The Young Professionals Lunch will provide a forum for discussion between current students and GOLD members (Graduates of the Last Decade). This lunch will provide an opportunity to discuss suggested career paths, skill sets beneficial to secure employment in the geosciences and remote sensing industries, as well as professional development opportunities.

### Women in Engineering Reception

Date: Tuesday July 23
Time: 17:30 - 19:00
Location: Meeting Room 108
Melbourne Convention & Exhibition Centre
Dress: Smart casual
Cost: $20

This reception is the second annual Women in Geosciences and Remote Sensing event at IGARSS. The reception is open by registration to women and men at all stages in their careers. The event will provide networking opportunities and a forum of discussion between participants. The featured guest will be Gypsy Bhalla, an engaging speaker who thinks deeply about the many issues facing professionals.

Gypsy is currently the Chair of the National Spatial Education Leadership Group in Australia. She is the past Chair of the Remote Sensing and Photogrammetry Commission of the Surveying and Spatial Sciences Institute, the peak professional body in Australia. Gypsy is currently Section Leader and Spatial Scientist at Geoscience Australia. Geoscience Australia is the Australian Government's lead agency on both the geosciences and the spatial sciences.

### Melbourne Aquarium Reception

Date: Tuesday July 23
Time: 19:00-20:30
Location: Melbourne Aquarium , Corner of King and Flinders Street Melbourne (short walk from the MCEC)
Dress: Smart casual
Cost: $80

Discover the amazing underworld beauty of the Melbourne Aquarium whilst you enjoy a selection of canapés and drinks. A great chance to be up close and personal with the creatures of the sea. The Aquarium is a short walk from the Melbourne Convention and Exhibition Centre.

### IGARSS Futsal Soccer Game

Date: Wednesday July 24
Time: 18:15-23:00
Location: North Melbourne Recreation Centre
204-206 Arden St, North Melbourne
Please note this is an indoor event
Dress: Participants: Jerseys will be provided but players must provide their own shorts and sports shoes (no studs or cleats are to be worn)
Spectators: Smart casual
Cost: Participant cost $20 (includes transportation, jersey and refreshments)
Spectator cost $10 (includes transportation only)

Come along and participate in the IGARSS Futsal World Cup. A round robin format will play out before the remaining two teams compete in the final for the IGARSS World Cup.

*Coach transfers will be available for all participants and will depart the Melbourne Convention and Exhibition Centre (MCEC) South Wharf / Hilton Entrance at 17:30. A return coach will be available departing from the soccer ground at 23:00 returning to the MCEC.*

### Technical Site Tour - Bushfire Region

Date: Wednesday July 24
Time: 08:30-17:30
Dress: Smart casual
Cost: $55

The 2009 Black Saturday forest fires in the Australian state of Victoria, was a catastrophic event. This tour follows the path of these bush fires and looks at the use of imagery and spatial data during this event.

Led by one of the Chief Fire Officers who was directly involved in the management of the fires the drive takes you up the mountains and through some of the tallest and most majestic eucalypt forests in the world. The tour will take you to the origin of one of the fires and you will hear the description of

the day as it unfolded. Then it will be on to the emergency management control centre to see in detail how fires are managed and the role spatial data plays. This will be followed by lunch at Marysville, one of the towns almost completely destroyed by the fires. There you will be led through the slow process of recovery by this resilient community. The final stop will be at Stevensons Falls - a picturesque forested valley that was literally destroyed by the fires and you will see how nature is recovering.

The integral role played by remote sensing during the fires, in the analysis of the damage after and ongoing during the recovery will be blended into the discussions throughout the day.

*The coach will depart from the Melbourne Convention and Exhibition Centre (MCEC) South Wharf / Hilton Entrance at 08:30 returning back to the MCEC at 17:30.*

#### Technical Committee and Chapter Chairs Dinner

Date: Wednesday July 24
Time: 19:00-21:00
Location: MCEC Meeting Room 210
Dress: Smart casual
Cost: $45

Members of GRSS Technical Committees and GRSS Chapter Chairs are invited, along with IGARSS delegates (and guests) to learn more about the technical committees and activities of our chapters. This event provides a venue for discussion of GRSS Technical Committee and Chapter activities accompanied by a fine meal.

#### Symposium Dinner sponsored by Bureau of Meteorology

Date: Thursday July 25
Time: 19:00-23:00
Location: Plaza Ballroom, 191 Collins St Melbourne
Dress: Black tie
Cost: $80

Join colleagues and friends as you enjoy the Symposium dinner at the Plaza Ballroom. Situated in the heart of Collins Street at Melbourne's famous Regent Theatre, the prestigious Plaza Ballroom is reminiscent of the grand European ballrooms of the 19th Century. Built in 1929, the venue has undergone meticulous restoration returning it to its breathtaking former glory. A unique snapshot of Melbourne in days gone by.

*Coach transfers will depart at 18:30 from the Melbourne Convention and Exhibition Centre (MCEC) South Wharf/ Hilton Entrance to the Plaza Ballroom. A return shuttle service will commence departure at 22:30, from the Plaza Ballroom to neighbouring hotels and the MCEC.*

## Symposium Information

#### Symposium Venue

Melbourne Convention and Exhibition Centre
1 Convention Centre Place
South Wharf VIC 3006
T +61 3 9235 8000
www.mcec.com.au

#### Wifi Internet

Complimentary platinum wireless internet is available for symposium delegates. To log in please enter the following information:

Username: IGARSS IEEE
Password: access2013

#### Mobile App

The IGARSS 2013 Mobile App is a native application for iPad, smartphones (iPhone and Android), a hybrid web-based app for Blackberry, and there's also a web-based version of the application for all other web browser-enabled phones.

Downloading the app is easy. Simply:

- Scan the QR Code (all device types)
- Search for IGARSS 2013 in the app store (Android and iOS)
- Type the following URL into your device's mobile browser: http://m.core-apps.com/igarss2013

#### Speaker Preparation Room

The speaker preparation room is located in Meeting Room 107 on level one of the Melbourne Convention and Exhibition Centre (MCEC). This room will be available for all presenters to upload their presentations with the audio visual technician. This area will be staffed by a technician and will be open during the following times:

Sunday 21 July.....17:30 – 20:30
Monday 22 July.....08:00 – 17:30
Tuesday 23 July.....07:30 – 17:30
Wednesday 24 July.....07:30 – 17:30
Thursday 25 July.....07:30 – 17:30
Friday 26 July.....07:30 – 17:30

All presenters are required to visit the speaker preparation room and provide their presentation on a USB to the audio visual technician at least two hours prior to the commencement of their session. This will ensure that the technician has met with all presenters and that they are fully aware of your presentation requirements. It is our objective that presentations operate as smoothly as possible.

### Registration Desk

The registration desk is located on the ground floor of the Melbourne Convention and Exhibition Centre and can be contacted on +61 3 8400 4476 during opening hours. The desks will be opened at the following times:

Sunday 21 July .....08:00 – 18:00
Monday 22 July.....08:00 – 19:00
Tuesday 23 July.....07:30 – 19:00
Wednesday 24 July .....07:30 – 19:00
Thursday 25 July.....07:30 – 19:00
Friday 26 July .....07:45 – 17:30

### Student Ambassadors and Volunteers sponsored by Digital Globe

The student ambassadors and volunteers will be located throughout the symposium in red polo shirts. If you have any queries about the symposium or Melbourne feel free to ask the people in red with the big "Ask Me!" on their back.

### Symposium Meeting Space sponsored by ST Electronics

A meeting space is available to attendees for short, informal meetings of up to 8 seated persons. The space is located adjacent to the JAXA exhibit booth on the ground floor foyer of the MCEC. A booking sheet is available in the space for scheduling meetings of up to one hour.

### Symposium Lounge sponsored by Digital Globe

The symposium lounge is available to attendees in the exhibit area. Feel free to meet here and relax with your fellow delegates throughout the symposium.

### Name Badges sponsored by CSIRO

All participants will receive a name badge upon registration. Name badges are required at all times for identification purposes and admission to symposium sessions, exhibition, and catering breaks.

Admission to social functions will be by tickets. If you misplace your name badge, please approach the registration desk to obtain a replacement.

Delegates who are unable to attend their social functions can return their ticket to the registration desk so another delegate may attend. Please note that refunds will not be available. This is a service to facilitate maximum attendance at all sessions and to assist delegates who may have missed out on the opportunity to attend. For available tickets, please approach the registration desk frequently for updates.

### Catering sponsored by CSIRO, Bureau of Meteorology, and PortableAS

Morning and afternoon tea breaks will be served amongst the exhibition, located on the ground floor.

### Lunch Packages

If lunch packages have been purchased in advance via the online registration, lunch vouchers have been included in your registration pack. To collect your lunch package each day please take your voucher to one of the IGARSS lunch kiosks on the ground floor.

### Special Dietary Requirements

If you have advised the symposium secretariat of special dietary requirements, please speak to a member of the Melbourne Convention and Exhibition Centre staff during catering breaks, or at any of the evening functions that you may be attending. Catering staff have a full list of delegates with special dietary requirements.

### Mobile Phones

Delegates are requested to use mobile phones with consideration for others. Please be sure to switch off during all sessions.

### Charge Bar sponsored by Space Policy Unit, DIICCSRTE, Australian Government

The symposium charge bar is a free standing mobile phone and tablet charger that can charge up to 18 devices at once, covering 95% of phones on the market. Attendees are free to use this service any time during the conference. The charge bar is located in the exhibit area if you're running low on power.

### Smoking Policy

The Victorian Government imposes a strict no smoking policy in venues, restaurants, bars and shopping centres in Melbourne. The Melbourne Convention and Exhibition Centre is a smoke free facility. No indoor smoking areas are provided.

### Personal Property

Please take good care of your personal belongings. Do not leave them unattended. The organisers and the symposium secretariat will not be responsible for any loss or damage to your personal properties.

### Prayer Room

A designated prayer room is located on the Ground Floor and is open during the normal operating hours of the Centre.

### Disclaimer

The International Geoscience and Remote Sensing Symposium 2013 including the Organising Committee and the Secretariat, and all suppliers to the symposium and their servants, agents, contractors and consultants, will not accept liability for the damages of any nature sustained by participants or their accompanying persons or loss or damage to their personal property as a result of the IGARSS 2013 or related events.

All details contained in this handbook are correct at the time of printing.

## Transport

The superb central location of the Melbourne Convention and Exhibition Centre means it is easily accessed by the city's roadways, freeways, public transport and on foot. The City Link automated tollway connects the venue to the airport in just 20 minutes. The venue is also serviced by six parking areas suitable for public, exhibitor and bus parking with additional parking available within walking distance of the centre.

### Public Transport

#### Tram/Train/Bus Ticketing System – MYKI

myki is the smart card ticketing system that operates on trains, trams and buses throughout Melbourne.

You may purchase a ticket online in advance www.myki.com.au or visitors packs can be purchased at the Business Centre of the Melbourne Convention and Exhibition Centre, the M Cafe located at the Clarendon Street entrance to the Melbourne Exhibition Centre, PTV Hub at Southern Cross Station, the Melbourne Visitor Centre at Federation Square and the SkyBus terminals at Melbourne Airport and Southern Cross Station.

Top ups to existing cards can also be made at the tram stop directly opposite the Clarendon Street entrance to the Melbourne Convention & Exhibition Centre (on the side of the road travelling south) or at the Seven Eleven Store on the corner of Flinders and Spencer Streets.

#### Trams

A tram stop is located on Clarendon Street opposite the Clarendon Street entrance to the Melbourne Convention and Exhibition Centre. There is also a tram stop on Wurundjeri Way (Flinders Street West extension) which is accessible via the Yarra River footbridge and Siddeley Street. The venue and CBD are located within Zone 1. Information regarding tram timetables is available from Yarra Trams.

The **City Circle tram** service operates within Melbourne's central business district. The service operates in a circular route passing major tourist attractions, as well as linking with other tram, train and bus routes in and around Melbourne. Trams run in both directions approximately every twelve minutes between 10am and 6pm Sunday to Wednesday and extended hours, 10am - 9pm Thursday, Friday and Saturday. Clockwise service: Flinders Street > Harbour Esplanade > Docklands Drive > La Trobe Street > Victoria Street > Nicholson Street > Spring Street > Flinders Street.

From the Melbourne Convention and Exhibition Centre your closest stop is on the corner of Flinders Street and Spencer Street. To get to this stop you need to exit the Melbourne Exhibition Centre onto Clarendon Street and head north over the bridge until you get to the major intersection www.yarratrams.com.au

#### Trains

Southern Cross and Flinders Street stations are both a short stroll from the venue. These stations are major hubs for suburban, regional and interstate rail services. For tram and train timetables visit the Metro Melbourne website. http://www.metrotrains.com.au

#### Taxis

Central Booking System Tel: 13 2227

Taxi ranks are right on the doorstep at the following locations:
Melbourne Exhibition Centre
Melbourne Convention Centre
Crown Entertainment Complex
Southern Cross Station

#### Airport Transfers

Skybus Super Shuttle is the official transit link between Melbourne Airport and the central business district. It departs every 15 minutes from Southern Cross station, a five-minute walk from the venue. Purchase tickets and view the timetable at the Skybus website www.skybus.com.au

#### MCEC Car Park Locations

Visit the MCEC website for car park locations, rates and open hours mcec.com.au/where-is-mcec

## General Information

### Banking, Currency and Exchange Rate

Banking hours are generally 09:00 to 16:00 and extended on Fridays to 17:00. Several international banks have offices in the Central Business District. Currency exchanges are located at airports, banks and major hotels. Consult a bank for the latest exchange rate. Decimal currency is used in Australia (AUD) and currency units are dollars and cents. Australian notes are: $100, $50, $20, $10, $5. Coins are: $2, $1, 50, 20, 10, and 5 cents. Australian currency fluctuates on the international monetary exchange. Therefore we recommend checking with your local bank for the exchange rate just prior to your arrival in Australia or visit www.x-rates.com for the current exchange rates.

### Credit Cards

Most hotels, large restaurants and shops will accept international credit cards, the most widely recognised being American Express, Diners Club, MasterCard and Visa. Automatic teller machines are plentiful and situated throughout the city.

### Driving License

International Driving Licenses are recognised throughout Australia. Car rental companies ask for a valid driving license.

### Electricity

Electrical current is 240/250V, AC 50Hz. The Australian flat three-pin power outlet is different from that in many countries, so you will need an adaptor. If your appliances are 110V,

check if there is a 110/240V switch. If not, you will need a voltage converter. Universal outlets for 240V or 110V shavers are usually found in leading hotels.

#### Health

Vaccinations are not required unless you have come from a yellow fever-infected country zone within six days prior to your arrival. You do not need any other health certificate to enter Australia. Australia has a high standard of hygiene and doctors and dentists are highly trained and hospitals are well equipped. In the event of illness, hotel staff can arrange a doctor for you.

#### Tax

Australia applies a tax to the purchase of both goods and services called the Goods and Services Tax (GST). The rate of tax that applies to taxable products and services is 10%. Tax is already included in the advertised prices. Non-Australian delegates may be eligible for a refund of GST via the Tourist Refund Scheme.

#### Tipping

Tipping is not as widespread or regulated in Australia as it is in other parts of the world. Tipping is your prerogative, a reward for service. It is customary to tip hotel porters, and a gratuity of about 10% is usual in restaurants if good service is received. No service charge is added to hotel or restaurant bill.

#### Useful Contacts

Emergency number (Ambulance/ Fire/ Police) ..... 000
Weather ..... 03 9669 4000
Melbourne airport ..... 03 9297 1600
Flight information:
www.melbourneairport.com.au/Flight-Passenger-Info/Overview.html

## Day Tours

A range of day tours are on offer to enable you to experience the sights and sounds of Melbourne and the nearby regional areas.

If you would like to make a booking please contact Vicki Lont from WALDRONSMITH Management on 03 9645 6311 or vicki@wsm.com.au.

All activities are subject to availability and must be paid for at the time of booking via credit card.

#### Great Ocean Road Adventure Tour

| | |
|---|---|
| Date: | Tours available daily |
| Time: | 08:00 – 19:30 |
| Cost: | Adults: $164 |
| | Children: $82 |
| Transport: | Pick up from hotel |

The Great Ocean Road is one of the world's great drives, a dramatic, powerful, dangerous and majestic coastline, also known as the Shipwreck Coast. Your day on the Great Ocean Road extends from Geelong to Bells Beach through Torquay, Lorne and Apollo Bay. After your lunch stop you continue on through the Otway National Park, to the rugged beauty of the Twelve Apostle National Park and the Twelve Apostles themselves is there really twelve? To Loch Ard Gorge and Port Campbell shaped by the wild Southern Ocean this coastline will not fail to impress. Got your camera?

#### Penguin Express Tour

| | |
|---|---|
| Date: | Tours available daily |
| Time: | 15:00 - 21:00 |
| Cost: | Adults: $126 |
| | Children: $63 |
| Transport: | Pick up from hotel |

An evening tour for those with time constraints that takes you directly to the natural phenomenon of the Penguin Parade.

#### Yarra Valley Wineries

| | |
|---|---|
| Date: | Tours operate on Monday/Wednesday/ Friday/Saturday |
| Time: | 10:00 - 17:30 |
| Cost: | Adults: $168 |
| | Children: $84 |
| Transport: | Pick up from hotel |

A delightful afternoon tour through the beautiful Blue Dandenongs and the Yarra Valley. Sample some of the best wine, food and scenery of Victoria and visit Fergusson's Winery, Rochford Wines and Dominique Portet.

#### Morning Melbourne City Tour

| | |
|---|---|
| Date: | Tours available daily |
| Time: | 08:10 -11:10 AM |
| Cost: | Adults: $60 |
| | Children: $30 |
| Transport: | Pick up from hotel |

Welcome to Melbourne - Heart of Australia's classic south. Home to the Australian Open Tennis, Australian rules football, the Melbourne Cup and for a short time Australia's capital. Melbourne is known for its gardens, restaurants, cafes and markets, galleries, the arts and its relaxed elegant charm. Inhabited by peoples from all corners of the globe its cosmopolitan people give generously and share passionately in the riches of this dynamic and elegant city.

## Discover Melbourne

#### Australian Rules Football

While visiting Melbourne, Australia, expect to overhear plenty of fervent sports talk about one of the country's most popular sporting games - Australian Rules Football. Also referred to as 'Aussie Rules' or 'footy', and while it takes on aspects of Rugby and Gaelic football, it's unique to Australia.

To watch an Aussie Rules football game during your stay please visit www.ticketek.com.au or www.ticketmaster.com.au to book.

#### Local Melbourne Tours

When wandering in the city, peer down almost any laneway and catch a glimpse of the 'secret Melbourne' – a place of edgy art, hidden bars and cutting-edge design.

#### Laneways of Melbourne

Heard about the cool laneways in Melbourne and want to discover them with a friendly local? Don't miss some of our best secret galleries, shops or cafes!

www.meltours.com.au/laneways.html

#### Street Art Tours

Melbourne Street Art Tours is the first street art tour in Australia that is run by street artists, providing an overview of the Melbourne underground street art scene.

www.melbournestreettours.com

#### Family Activities

Once you arrive in Melbourne you can experience a range of tours and discover Melbourne and its vast contrasts – perfect for accompanying persons and families.

View tours information and book through the web links below otherwise you can book upon arrival at the entrance of each respective venue.

#### Aquarium

Melbourne Aquarium is centrally located along the picturesque banks of the Yarra River in Melbourne's CBD. The aquarium offers an unforgettable day out for the whole family.

www.melbourneaquarium.com.au

#### Melbourne Cricket Ground (MCG) Tour

Backstage the MCG Tour gives the visitor the opportunity to relive their great sporting memories through a tour of this marvellous stadium, where so many champions have performed.

www.mcg.org.au/Tours

#### Melbourne Museum

Melbourne Museum explores life in Victoria, from our natural environment to our culture and history. A visit to Melbourne Museum offers rich and often surprising insights into life in Victoria.

www.museumvictoria.com.au/melbournemuseum

#### Melbourne Zoo

There is always something to see at Melbourne Zoo, with more than 320 species from around the world on view.

www.zoo.org.au/MelbourneZoo

#### Science Works

Scienceworks makes learning about science and technology a fun, interactive adventure. Hands-on participation is positively encouraged and visitors can take part in live demonstrations, shows, guided tours and special activities.

www.museumvictoria.com.au/scienceworks

## Future IGARSS Symposia

- IGARSS 14: July 13 - July 18, 2014, Quebec City, Canada
- IGARSS 15: July 26 - July 31, 2015, Milan, Italy

## Presentation Instructions

### Oral Presentations

The official language of the Symposium is English. Each oral presentation is allocated 20 minutes, of these the last 5 minutes shall be used for questions, discussion and change over.

Presenters should be in the session room 20 minutes before the session begins to meet with the session chair, who should be near the stage/lectern. P**resentations shall be uploaded to a computer in the speaker preparation room at least two hours prior to the session start.** Presenters are advised when uploading their presentation to check if formulas/animations are shown correctly.

The speaker preparation room is located in Meeting Room 107 on level one of the Melbourne Convention and Exhibition Centre (MCEC). This room will be available for all presenters to upload their presentations with the audio visual technician. This area will be staffed by a technician and will be open during the following times:

Sunday 21 July.....17:30 – 20:30
Monday 22 July.....08:00 – 17:30
Tuesday 23 July.....07:30 – 17:30
Wednesday 24 July.....07:30 – 17:30
Thursday 25 July.....07:30 – 17:30
Friday 26 July.....07:30 – 17:30

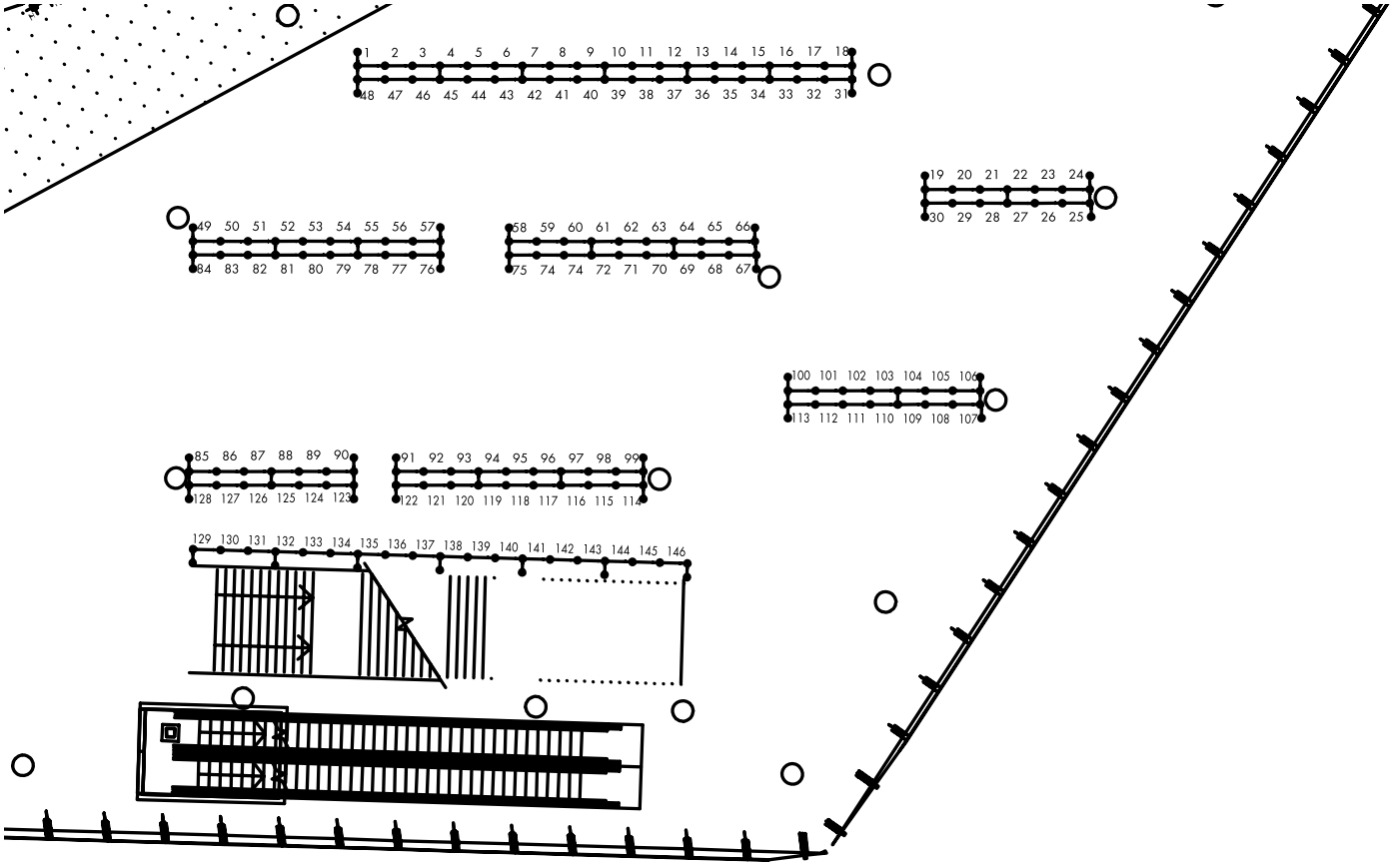
Presentations from personal laptops are not allowed, to ensure smooth programme running and to minimise transition time between presentations. The possibility to present from PCs other than the Intelligent Lectern is not allowed.

### Poster Presentations and Display Hours

For each paper accepted within a poster session, one poster board in portrait format is reserved with a dimension of 1 meter wide by 2 meters tall. The poster area is in the foyer on the ground floor of the MCEC. The board numbering is identified below.

Posters shall be on display during the day dedicated to the specific poster session. Authors are invited to be on stand-by near their posters during the session breaks and must be near their poster during the dedicated poster session at 17:20–19:00.

## Poster Area Detail — MCEC Ground Floor Foyer



## Tutorials

### Full-Day Tutorials

**Sunday, July 21, 09:00 - 17:00**

***FD-1: Advanced Classification Techniques for Remote Sensing***

*Ranga Raju Vatsavai, Surya Durbha*

Location: Room 105

***FD-2: Earth Observation Data Mining: Spatio-temporal Patterns Discovery in Heterogenous Data***

*Mihai Datcu*

Location: Room 106

***FD-3: Introduction to Radar Interferometry and its Applications***

*Scott Hensley, Paul Rosen*

Location: Room 103

***FD-5: Recent Advances in Hyperspectral Data Analysis***

*Qian Du, Antonio Plaza*

Location: Room 104

***FD-6: Remote Sensing with Reflected Global Navigation Satellite System (GNSS-R) Signals***

*James Garrison, Adriano Camps*

Location: Room 102

**Sunday, July 21, 09:00 - 12:30**

***HD-2: Nonlinear Unmixing of Hyperspectral Data***

*Paul Gader and Rob Heylen*

Location: Room 101

**Sunday, July 21, 13:30 - 17:00**

***HD-3: 3D and 4D SAR Tomography: From Basics to Applications***

*Fabrizio Lombardini*

Location: Room 101

## Student Paper Competition

All IEEE student members were invited and encouraged to enter the IGARSS Student Paper Prize Competition. Ten finalists have been selected by a committee to present their papers during a special session at the symposium in Melbourne on Tuesday morning, July 23 in Room 111. Three prizes will be presented: First Prize (Mikio Takagi Student Prize) endowed with US$ 1000.00, Second Prize endowed with US$ 750.00, Third Prize endowed with US$ 500.00, plus certificates for each. Following the special session at IGARSS, a complimentary ticket to the GRSS Annual Awards Banquet has been offered to the 10 finalists. The ten finalists are listed below:

### TU1.T02.1: A RADAR-RADIOMETER SURFACE SOIL MOISTURE RETRIEVAL ALGORITHM FOR SMAP

*Ruzbeh Akbar; University of Southern California*
*Mahta Moghaddam; University of Southern California*

### TU1.T02.2: AUTOMATIC CO-REGISTRATION OF SATELLITE IMAGERY AND LIDAR DATA USING LOCAL MUTUAL INFORMATION

*Ebadat Ghanbari Parmehr; Cooperative Research Centre for Spatial Information*
*Clive Fraser; Cooperative Research Centre for Spatial Information*
*Chunsun Zhang; Cooperative Research Centre for Spatial Information*
*Joseph Leach; University of Melbourne*

### TU1.T02.3: GEODETIC QUALITY ASSESSMENT OF A LOW-COST INSAR TRANSPONDER

*Pooja Mahapatra; TU Delft*
*Sami Samiei-Esfahany; TU Delft*
*Ramon Hanssen; TU Delft*
*Hans van der Marel; TU Delft*

### TU1.T02.4: THE SPECTRAL-SPATIAL CLASSIFICATION OF HYPERSPECTRAL IMAGES BASED ON HIDDEN MARKOV RANDOM FIELD AND ITS EXPECTATION-MAXIMIZATION

*Pedram Ghamisi; University of Iceland*
*Jon Atli Benediktsson; University of Iceland*
*Magnus O. Ulfarsson; University of Iceland*

### TU1.T02.5: SHORT-RANGE FMCW X-BAND RADAR PLATFORM FOR MILLIMETRIC DISPLACEMENTS MEASUREMENT

*Andrei Anghel; University Politehnica of Bucharest / GIPSA-lab*
*Gabriel Vasile; CNRS / GIPSA-lab*
*Remus Cacoveanu; University Politehnica of Bucharest*
*Cornel Ioana; CNRS / GIPSA-lab*
*Silviu Ciochina; University Politehnica of Bucharest*

### TU2.T02.1: MULTISPECTRAL LAND-USE/LAND-COVER MODEL PORTABILITY IN MULTI-TEMPORAL MULTI-ANGLE VERY HIGH RESOLUTION IMAGERY

*Nathan Longbotham; University of Colorado*
*William (Bill) Emery; University of Colorado*
*Fabio Pacifici; DigitalGlobe Inc.*

### TU2.T02.2: ESTIMATING THE GROUND HEIGHT WITH L-BAND IFSAR IN A WIND-BLOWN FOREST ENVIRONMENT

*Michael Benson; University of Michigan*
*Leland Pierce; University of Michigan*
*Kamal Sarabandi; University of Michigan*

### TU2.T02.3: SEMANTIC SUBSPACE LEARNING FOR MENTAL SEARCH IN SATELLITE IMAGES

*Phong D. Vo; Telecom ParisTech*
*Hichem Sahbi; Telecom ParisTech*

### TU2.T02.4: FIRST DEMONSTRATION OF 3-D HOLOGRAPHIC TOMOGRAPHY WITH FULLY POLARIMETRIC MULTI-CIRCULAR SAR AT L-BAND

*Octavio Ponce; German Aerospace Center (DLR)*
*Pau Prats-Iraola; German Aerospace Center (DLR)*
*Rolf Scheiber; German Aerospace Center (DLR)*
*Andreas Reigber; German Aerospace Center (DLR)*
*Alberto Moreira; German Aerospace Center (DLR)*

### TU2.T02.5: SAR SIMULATION FOR LARGE SCENES BY RAY TRACING TECHNIQUE BASED ON GPU

*Tingting Liu; Shanghai Jiao Tong University*
*Kaizhi Wang; Shanghai Jiao Tong University*
*Xingzhao Liu; Shanghai Jiao Tong University*

## GRSS Technical Committees

The Geoscience and Remote Sensing Society has established a number of Technical Committees to actively promote discussion and advances in areas of member technical interests. Activities of the Technical Committees include the organization of special sessions at IGARSS along with hosting a committee meeting open to all IGARSS participants. The following is a list of current technical committees, brief statements of interest, special sessions and meetings at IGARSS 2013.

### Data Archiving and Distribution

The DAD TC mission is to provide recommendations and responses to issues related to the archiving and distribution of remotely sensed geospatial and geotemporal data, and on how new media, transmission means, and networks will impact the archiving, distribution, and format of remotely sensed data.

*DAD TC Session: Ensuring Credibility of Remote Sensing Data Products, Mon., Room 208, 15:40-17:20*

*DAD TC Meeting: Mon., Room 208, 17:30-18:30*

### Data Fusion

The DFTC serves as a global, multidisciplinary, network for geospatial data fusion, connecting people and resources. It aims at educating students and professionals, and at promoting best practices in data fusion applications.

*DFTC Session: Data Fusion, Tues., Room 207, 13:30-17:20*

*DFTC Meeting: Tues., Room 207, 17:30-18:30*

### Frequency Allocations in Remote Sensing

The FARS TC mission is to provide technical assessments, guidance and recommendations regarding matters of frequency sharing and interference between remote sensing and other uses of the radiowave spectrum.

*FARS TC Session: Allocations in Remote Sensing and RFI Mitigation for Microwave Radiometry, Mon., Room 105, 15:40-17:20*

*FARS TC Meeting: Mon., Room 105, 17:30-18:30*

### Instrumentation and Future Technologies

The IFT TC mission is to facilitate, engage and coordinate GRSS members and the communities-at-large to: assess the current state-of-the-art in remote sensing instruments and technology, identify new instrument concepts and relevant technology trends, and recognize enabling technologies for future instruments. The committee actively promotes and provides insight to institutions and industry on remote sensing instrument and technology development. This TC has several working groups on specific focused technologies.

*IFT TC Active Microwave Session: Next Generation Radar Instruments and Technologies for Future Missions and Mission Concepts, Thurs., Room 207, 13:30-15:10*

*IFT TC Active Microwave Session: Digital Calibration Techniques for Multi-Channel SAR Systems, Fri., Room 207, 15:40-17:20*

*IFT TC Microwave Radiometer Session: Sub-orbital Microwave Radiometers, Wed., Room 104, 8:20-10:00*

*IFT TC Lidar Session: Space Lidar: Missions, Technologies and Observations, Fri., Room 111, 8:20-10:00*

*IFT TC Small Satellite Session: Remote Sensing Instruments and Technologies for Small Satellites, Tues., Room 105, 13:30-17:20*

*IFT TC Meeting: Thurs., Room 207, 17:30-18:30*

### International Spaceborne Imaging Spectroscopy

The ISIS Working Group provides a forum for technical and programmatic discussion and consultation among national space agencies, research institutions and other spaceborne IS data providers. Goals of the ISIS are to share information on current and future spaceborne imaging spectroscopy ("hyperspectral") missions, and to seek opportunities for new international partnerships to the benefit of the global user community.

~~*ISIS WG Session: Calibration of and Cross-Calibration with Orbiting Imaging Spectrometers, Wed., Room 101, 15:40-17:20*~~

*ISIS WG Session: Spaceborne Imaging Spectroscopy Missions – Current and Future Activities, Thurs., Room 208, 8:20-12:10*

*ISIS WG Meeting: Wed., Room 101, 17:30-18:30*

NOTE: The Technical Committee meetings are open to all IGARSS participants. All are invited to learn more about their activities.

In addition, IGARSS participants are invited to attend the Technical Committees and Chapter Chairs Dinner at which there will be brief presentations by the Chairs of the Technical Committees. Pre-registration is required.

# Technical Program

## Paper Identifiers

| Example: | TU | 4 | . | T01 | . | 4 |
|---|---|---|---|---|---|---|
| **Meaning:** | **Day** | **Time Block** | **Separator** | **Track** | **Separator** | **Sequence** |

### Day

MO ..... Monday, July 22
TU..... Tuesday, July 23
WE ..... Wednesday, July 24
TH..... Thursday, July 25
FR..... Friday, July 26

### Time Block

1 ..... First Morning Session .....08:20 - 10:00
2 ..... Second Morning Session.....10:30 - 12:10
3 ..... First Afternoon Session.....13:30 - 15:10
4 ..... Second Afternoon Session.....15:40 - 17:20
P ..... Evening Poster Session .....17:20 - 19:00

### Room

All technical program events are held in the Melbourne Convention and Exhibition Centre (MCEC).

### Sequence

Oral..... Order of presentation.
Poster..... Board number (Complete poster board identifier is the Track plus the Sequence.)

Monday, July 22 | 13:30 - 15:10 | Room 101
Session MO3.101 | Oral

### Education and Remote Sensing

Session Chair: Charles Luther, Retired

**MO3.101.1** 13:30 **THE ESA LEARNEO! PROJECT FOR STIMULATING EARTH OBSERVATION EDUCATION**
*Fabio Del Frate, University of Rome Tor Vergata, Italy; Pierre-Philippe Mathieu, European Space Agency, Italy; Valborg Byfield, Chris Banks, National Oceanography Centre, United Kingdom; Malcolm Dobson, Bilko Develoment Limited, United Kingdom; Matteo Picchiani, GEO-K srl, Italy; Vinca Rosmorduc, Collecte Localisation Satellites, France*

**MO3.101.2** 13:50 **THE LINKAGES BETWEEN STEM EDUCATION AND HOMELAND SECURITY SCIENCES AND MANAGEMENT**
*Delandria Jones, Jaclyn P. Kuzniar, Alcorn State University, United States; TeAmbreya Moore, NCCC Southern Region and FEMA, United States; Sam Nwaneri, Alcorn State University, United States*

**MO3.101.3** 14:10 **SOFTWARE ENVIRONMENTS FOR ATMOSPHERIC LIDAR REMOTE SENSING**
*Nimmi C. P. Sharma, Central Connecticut State University, United States; Jo Ann Parikh, Southern Connecticut State University, United States*

**MO3.101.4** 14:30 **SCIENCE AND OPERATIONAL APPLICATIONS RESEARCH FOR RADARSAT-2**
*Stephane Chalifoux, Steve Iris, Daniel De Lisle, Canadian Space Agency, Canada*

Monday, July 22 | 13:30 - 15:10 | Room 102
Session MO3.102 | Oral

### Extra-terrestrial Geoscience and Remote Sensing

Session Chair: Catherine Walker, University of Michigan

**MO3.102.1** 13:30 **IMAGING SIMULATION AND LAYERING PARAMETER INVERSION FROM RADAR SOUNDER ECHOES OF MARS SURFACE/SUBSURFACE**
*Ya-Qiu Jin, Hongxia Ye, Chuan Liu, Fudan University, China*

**MO3.102.2** 13:50 **THE INFLUENCE OF ORGANIC MATTER ON SOIL DIELECTRIC CONSTANT AT MICROWAVE FREQUENCIES (0.5-40GHZ)**
*Jun Liu, Shaojie Zhao, Lingmei Jiang, Linna Chai, Fengmin Wu, Beijing Normal University, China*

**MO3.102.3** 14:10 **CHARACTERIZATION OF BACKSCATTERED RADAR WAVES FROM THE LUNAR SURFACE**
*Arnab Muhuri, Swinky Dhingra, Avik Bhattacharya, Gopalan Venkataraman, Indian Institute of Technology Bombay, India*

**MO3.102.4** 14:30 **SATELLITE OBSERVATIONS OF FRACTURES IN STRUCTURALLY-COMPROMISED ICE: OBSERVATIONS OF RIFT BEHAVIOR AT THE HIGHLY FRACTURED AMERY ICE SHELF, EAST ANTARCTICA AND IMPLICATIONS FOR THE ICY SHELLS OF ENCELADUS AND EUROPA**
*Catherine Walker, Jeremy Bassis, University of Michigan, United States*

**MO3.102.5** 14:50 **AN APPROACH TO DETERMINE POSSIBLE EXISTENCE OF WATER ICE DEPOSITS ON LUNAR CRATERS USING MINISAR DATA**
*Pooja Mishra, Shailesh Kumar, Dharmendra Singh, Indian Institute of Technology Roorkee, India*

Monday, July 22 | 15:40 - 17:20 | Room 102
Session MO4.102 | Oral

### Coastal Hazards and Landslides

Session Chair: Josee Levesque, Defence Research and Development Canada

**MO4.102.1** 15:40 **A NEW SATELLITE-ERA TROPICAL CYCLONE DATA SET FOR THE SOUTHERN HEMISPHERE AND THE WESTERN NORTH PACIFIC OCEAN**
*Yuriy Kuleshov, Roald de Wit, Bureau of Meteorology, Australia; Terry Atalifo, Bipen Prakash, Alipate Waqaicelua, Fiji Meteorological Service, Fiji; Masashi Kunitsugu, Japan Meteorological Agency, Japan; Philippe Caroff, Météo-France, France; Fabrice Chane-Ming, Université de la Réunion, France*

**MO4.102.2** 16:00 **DETECTION OF MACROALGAE BLOOMS BY COMPLEX SAR IMAGERY**
*Hui Shen, Chinese Academy of Sciences, China; William Perrie, Bedford Institute of Oceanography, Canada; Zhongfeng Qiu, Nanjing University of Information Science & Technology, China*

**MO4.102.3** 16:20 **THE USE OF ENVIRONMENTAL VARIABLES TO PREDICT CHOLERA HAZARD**
*Min Xu, Chunxiang Cao, Sheng Zheng, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

**MO4.102.4** 16:40 **MONITORING THE DEFORMATION OF SHUPING LANDSLIDE WITH TERRASAR-X SPOTLIGHT IMAGES**
*Jinghui Fan, China Aero Geophysical Survey & Remote Sensing Center for Land and Resources(AGRS), China; Ye Xia, German Research Centre for Geosciences, China; Hongli Zhao, Man Li, Xiaofang Guo, China Aero Geophysical Survey & Remote Sensing Center for Land and Resources(AGRS), China; Pengfei Tu, China Three Gorges University, China; Guang Liu, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China; Hao Lin, China University of Geosciences, China*

**MO4.102.5** 17:00 **THE EUROPEAN DORIS DOWNSTREAM SERVICE AS A MULTI-SCALE SYSTEM FOR LANDSLIDES AND SUBSIDENCE RISK MANAGEMENT**
*Michele Manunta, Fabiana Calò, Chandrakanta Ojha, IREA-CNR, Italy; Francesca Ardizzone, Fausto Guzzetti, Alessandro Cesare Mondini, Paola Reichenbach, IRPI-CNR, Italy; Silvia Bianchini, Nicola Casagli, Andrea Ciampalini, Chiara Del Ventisette, Sandro Moretti, University of Firenze, Italy; Immaculada Garcia, Gerardo Herrera, Rosa Maria Mateos, IGME, Spain; Balázs Füsi, MFGI, Hungary; Marek Graniczny, Zbigniew Kowalski, Anna Piatkowska, Maria Surala, PGI, Poland; Hugo Retzo, FOEN, Switzerland; Tazio Strozzi, Gamma Remote Sensing, Switzerland; Davide Colombo, T.R.E., Italy; Oscar Mora, Monica Sanchez, Altamira Information, Spain*

Monday, July 22 | 13:30 - 15:10 | Room 103
Session MO3.103 | Oral-Invited

## NASA Soil Moisture Active Passive Mission (SMAP)

Session Co-Chairs: Dara Entekhabi, Massachusetts Institute of Technology; Peggy O'Neill, NASA Goddard Space Flight Center

**MO3.103.1** 13:30 **SMAP VALIDATION EXPERIMENT 2012 (SMAPVEX12): OVERVIEW AND OUTLOOK**
*Tom Jackson, USDA ARS Hydrology and Remote Sensing Laboratory, United States; Heather McNairn, Grant Wiseman, Agriculture and Agri-Food Canada, Canada; Andreas Colliander, Jet Propulsion Laboratory, United States; Aaron Berg, University of Guelph, Canada; Paul Bullock, University of Manitoba, Canada; Ramata Magagi, Sherbrooke University, Canada; Mahta Moghaddam, University of Southern California, United States; Seungbum Kim, Jet Propulsion Laboratory, United States; Michael Cosh, USDA ARS Hydrology and Remote Sensing Laboratory, United States; Eni Njoku, Jet Propulsion Laboratory, United States; Stephane Belair, Environment Canada, Canada*

**MO3.103.2** 13:50 **TOWARDS A MEDIUM RESOLUTION BRIGHTNESS TEMPERATURE PRODUCT FROM ACTIVE AND PASSIVE MICROWAVE OBSERVATIONS**
*Xiaoling Wu, Jeffrey P. Walker, Monash University, Australia; Narendra Das, Jet Propulsion Laboratory, United States; Rocco Panciera, University of Melbourne, Australia; Christoph Rüdiger, Monash University, Australia*

**MO3.103.3** 14:10 **L-BAND ACTIVE / PASSIVE TIME SERIES MEASUREMENTS OVER A GROWING SEASON USING THE COMRAD GROUND-BASED SMAP SIMULATOR**
*Peggy O'Neill, Mehmet Kurum, Alicia Joseph, John Fuchs, Peter Young, NASA Goddard Space Flight Center, United States; Michael Cosh, USDA ARS, United States; Roger Lang, George Washington University, United States*

**MO3.103.4** 14:30 **SMAP RFI MITIGATION ALGORITHM PERFORMANCE CHARACTERIZATION USING AIRBORNE HIGH-RATE DIRECT-SAMPLED SMAPVEX 2012 DATA**
*Sidharth Misra, Jet Propulsion Laboratory, United States; Joel Johnson, Mustafa Aksoy, The Ohio State University, United States; Jinzheng Peng, Damon Bradley, NASA Goddard Space Flight Center, United States; Ian O'Dwyer, Sharmila Padmanabhan, Douglas E. Dawson, Seth Chazanoff, Barron Latham, Todd C. Gaier, Caroline Flores-Helizon, Richard Denning, Jet Propulsion Laboratory, United States*

**MO3.103.5** 14:50 **SOILSCAPE IN SITU NETWORK FOR MULTI-SCALE VALIDATION OF SMAP DATA PRODUCTS**
*Mahta Moghaddam, Agnelo Silva, Ruzbeh Akbar, Daniel Clewley, Mariko Burgin, University of Southern California, United States; Aldrich Castillo, Dara Entekhabi, Massachusetts Institute of Technology, United States*

Monday, July 22 | 13:30 - 15:10 | Room 104
Session MO3.104 | Oral

## Tomography and 3D Mapping I

Session Co-Chairs: Fabrizio Lombardini, University of Pisa; Matteo Pardini, German Aerospace Center (DLR)

**MO3.104.1** 13:30 **HIGH RESOLUTION IN-SITU TOMOGRAPHY ON PINE FORESTS**
*Clément Albinet, Pierre Borderies, Alia Hamadi, Pascale Dubois-Fernandez, Office National d'Etudes et de Recherches Aérospatiales (ONERA), France; Thierry Koleck, Centre National d'Études Spatiales, France; Sébastien Angelliaume, Office National d'Etudes et de Recherches Aérospatiales (ONERA), France; Hubert Cantalloube, ONERA, France*

**MO3.104.2** 13:50 **TOMOGRAPHIC ANALYSIS FOR BOREAL FORESTS USING SINGLE-PASS L-BAND POLINSAR DATA**
*Yue Huang, Qiaoping Zhang, Marcus Schwaebisch, Ming Wei, Bryan Mercer, Intermap Technologies Corp., Canada*

**MO3.104.3** 14:10 **LARGE-SCALE WATER CLASSIFICATION OF COASTAL AREAS USING AIRBORNE TOPOGRAPHIC LIDAR DATA**
*Julien Smeeckaert, SHOM, France; Clément Mallet, Nicolas David, IGN, France; Nesrine Chehata, IRD/UMR LISAH, Tunisia; Antonio Ferraz, INESCC, Instituto de Engenharia de Sistemas e Computadores de Coimbra, Portugal*

**MO3.104.4** 14:30 **A NEW RPCS REFINING METHOD AND APPLICATION IN GEOPOSITIONING OF QUICKBIRD STEREO IMAGERY**
*Junpeng Yu, Weijun Gao, Beijing Institute of Space Mechanics and Electricity, China*

**MO3.104.5** 14:50 **SPACEBORNE SAR TOMOGRAPHY IN URBAN AREAS**
*Othmar Frey, ETH Zürich / Gamma Remote Sensing, Switzerland; Irena Hajnsek, ETH Zürich / German Aerospace Center (DLR), Switzerland; Urs Wegmuller, Gamma Remote Sensing, Switzerland*

Monday, July 22 | 15:40 - 17:20 | Room 103
Session MO4.103 | Oral

## Soil Moisture: Retrieval Algorithms I

Session Co-Chairs: Dongryeol Ryu, University of Melbourne; OPN Calla, ICRS

**MO4.103.1** 15:40 **A ROBUST ALGORITHM FOR SOIL MOISTURE RETRIEVAL FROM THE SOIL MOISTURE ACTIVE PASSIVE MISSION RADAR OBSERVATIONS**
*Parag Narvekar, Dara Entekhabi, Massachusetts Institute of Technology, United States; Seungbum Kim, Eni Njoku, Jet Propulsion Laboratory, United States*

**MO4.103.2** 16:00 **COVARIABILITY OF AQUARIUS L-BAND ACTIVE AND PASSIVE OBSERVATIONS OVER LAND**
*Dara Entekhabi, Massachusetts Institute of Technology, United States; María Piles Guillem, Universitat Politècnica de Catalunya (UPC), Spain; Kaighin McColl, Massachusetts Institute of Technology, United States; Narendra Das, Jet Propulsion Laboratory, United States; Miriam Pablos Hernández, Adriano Camps, Universitat Politècnica de Catalunya (UPC), Spain*

**MO4.103.3** 16:20 **ASSESSING THE ANGULAR DENSITY OF PASSIVE MICROWAVE L-BAND DATA**
*Sandy Peischl, Nan Ye, Jeffrey P. Walker, Monash University, Australia; Dongryeol Ryu, The University of Melbourne, Australia; Yann H. Kerr, Centre d'Etudes Spatiales de la BIOsphère, France*

**MO4.103.4** 16:40 **UNCERTAINTY ANALYSIS OF SOIL MOISTURE AND VEGETATION INDICES USING AQUARIUS RADAR OBSERVATIONS**
*Kaighin McColl, Dara Entekhabi, Massachusetts Institute of Technology, United States; María Piles Guillem, Universitat Politècnica de Catalunya (UPC), Spain*

**MO4.103.5** 17:00 **REFINEMENT OF SMOS MULTI-ANGULAR BRIGHTNESS TEMPERATURE AND ITS ANALYSIS OVER REFERENCE TARGETS**
*Tianjie Zhao, Jiancheng Shi, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China; Rajat Bindlish, Thomas Jackson, USDA ARS Hydrology and Remote Sensing Laboratory, United States; Yann H. Kerr, Centre d'Etudes Spatiales de la BIOsphère, France; Qian Cui, Yunqing Li, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China; Tao Che, Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences, China*

Monday, July 22 | 15:40 - 17:20 | Room 104
Session MO4.104 | Oral-Invited

## Multidimensional SAR Imaging Techniques

Session Co-Chairs: Fabrizio Lombardini, University of Pisa; Andreas Reigber, German Aerospace Center (DLR)

**MO4.104.1** 15:40 **SAR COHERENCE TOMOGRAPHY: A NEW APPROACH FOR COHERENT ANALYSIS OF URBAN AREAS**
*Gianfranco Fornaro, Antonio Pauciullo, Diego Reale, Simona Verde, National Research Council, Italy*

**MO4.104.2** 16:00 **MULTIDIMENSIONAL TOMOGRAPHY WITH NEW GENERATION VHR SAR DATA FOR URBAN MONITORING**
*Federico Viviani, University of Pisa / CNIT-RaSS, Italy; Andrea Pulella, University of Pisa, Italy; Fabrizio Lombardini, University of Pisa / CNIT-RaSS, Italy*

**MO4.104.3** 16:20 **HIGH RESOLUTION THREE-DIMENSIONAL IMAGING OF A SNOWPACK FROM GROUND-BASED SAR DATA ACQUIRED AT X AND KU BAND**
*Stefano Tebaldini, Politecnico di Milano, Italy; Laurent Ferro-Famil, Univerisy of Rennes I, Italy*

**MO4.104.4** 16:40 **FEATURE-BASED FUSION OF TOMOSAR POINT CLOUDS FROM MULTI-VIEW TERRASAR-X DATA STACKS**
*Yuanyuan Wang, Lehrstuhl für Methodik der Fernerkundung, Technische Universität München, Germany; Xiao Xiang Zhu, Lehrstuhl für Methodik der Fernerkundung, Technische Universität München; Remote Sensing Technology Institute (IMF), German Aerospace Center (DLR), Germany*

**MO4.104.5** 17:00 **TOMOGRAPHIC-QUALITY PHASE CALIBRATION VIA PHASE CENTER DOUBLE LOCALIZATION**
*Stefano Tebaldini, Mauro Mariotti d'Alessandro, Francesco Banda, Claudio Prati, Politecnico di Milano, Italy*

Monday, July 22 | 13:30 - 15:10 | Room 105
Session MO3.105 | Oral-Invited

### Novel Approaches to Remote Sensing

Session Co-Chairs: Tom Ainsworth, Naval Research Laboratory; Mark Williams, Horizon Geoscience Consulting

**MO3.105.1** 13:30 **A CAR-BORNE SAR AND INSAR EXPERIMENT**
*Othmar Frey, Gamma Remote Sensing / ETH Zürich, Switzerland; Charles Werner, Urs Wegmuller, Andreas Wiesmann, Gamma Remote Sensing, Switzerland; Daniel Henke, Christophe Magnard, University of Zurich, Switzerland*

**MO3.105.2** 13:50 **A 3 DIMENSIONAL RAY TRACING APPROACH TO MODELLING BUSHFIRE RADIANT HEAT FLUX FOR HOUSES USING LIDAR DERIVED VEGETATION VOXEL DATA AND QUADRATIC POLYGONAL FIRE FRONTS**
*Anders Siggins, Glenn Newnham, Raphaele Blanch, Justin Leonard, Commonwealth Scientific and Industrial Research Organisation, Australia*

**MO3.105.3** 14:10 **MULTI-DIMENSIONAL COHERENT TIME-FREQUENCY ANALYSIS FOR SHIP DETECTION IN POLSAR IMAGERY**
*Canbin Hu, National University of Defense Technology, China; Laurent Ferro-Famil, University of Rennes 1, France; Gangyao Kuang, National University of Defense Technology, China*

**MO3.105.4** 14:30 **FREQUENCY COHERENT VS. TEMPORALLY COHERENT TARGETS**
*Fabio Bovenga, Fabio Michele Rana, Alberto Refice, Research National Council of Italy, Italy; Davide Oscar Nitti, Politecnico di Bari, Italy; Nicola Veneziani, Research National Council of Italy, Italy*

**MO3.105.5** 14:50 **MIR: THE MICROWAVE INTERFEROMETRIC REFLECTOMETER, A NEW AIRBORNE SENSOR FOR GNSS-R ADVANCED RESEARCH**
*Raul Onrubia Ibáñez, Universitat Politècnica de Catalunya (UPC) and IEEC/UPC, Spain; Daniel Pascual Biosca, Universitat Politècnica de Catalunya (UPC), Spain; Adriano Camps, Universitat Politècnica de Catalunya (UPC) and IEEC/UPC, Spain; Alberto Alonso-Arroyo, Hyuk Park, Universitat Politècnica de Catalunya (UPC), Spain*

Monday, July 22 | 13:30 - 15:10 | Room 106
Session MO3.106 | Oral

### Differential SAR Interferometry I

Session Chair: Ramon Brcic, German Aerospace Center (DLR)

**MO3.106.1** 13:30 **EXPERIMENTAL STUDY OF ATMOSPHERIC CORRECTION TO INTERFEROGRAM WITH HIGH-RESOLUTION RADAR IMAGES AND DEM OVER SHUPING LANDSLIDE**
*Man Li, Ye Xia, Daqing Ge, Ling Zhang, Xiaofang Guo, Jinghui Fan, Yan Wang, China Aero Geophysical Survey & Remote Sensing Center for Land and Resources(AGRS), China*

**MO3.106.2** 13:50 **DETECTING CHANGES IN PERSISTENT SCATTERERS**
*Ramon Brcic, Nico Adam, German Aerospace Center (DLR), Germany*

**MO3.106.3** 14:10 **ISAR IMAGING VIA ADAPTIVE SPARSE RECOVERY**
*Wei Rao, Gang Li, Xiqin Wang, Tsinghua University, China*

**MO3.106.4** 14:30 **INSAR X-BAND ATMOSPHERIC WATER VAPOR ANALYSIS AND COMPARISON IN HONG KONG**
*Yuxiao Qin, Daniele Perissin, Ling Lei, The Chinese University of Hong Kong, Hong Kong SAR of China*

**MO3.106.5** 14:50 **CHANGE DETECTION IN MULTI-TEMPORAL TERRASAR-X SAR IMAGES USING A HIERARCHICAL MARKOV MODEL ON REGIONS**
*Jie Liu, Wen Yang, Gui-Song Xia, Mingsheng Liao, Wuhan University, China*

Monday, July 22 | 15:40 - 17:20 | Room 105
Session MO4.105 | Oral-Invited

### Allocations in Remote Sensing and RFI Mitigation for Microwave Radiometry

Session Chair: William Blackwell, MIT Lincoln Laboratory

**MO4.105.1** 15:40 **SMOS RFI IN THE 1,400-1,427 MHZ BAND: RFI DETECTION, UPDATED RFI STATUS WORLDWIDE AND PRELIMINARY QUANTIFICATION OF THE RFI IMPACT**
*Elena Daganzo-Eusebio, European Space Agency / ESTEC, Netherlands; Roger Oliva, European Space Agency, Spain; Philippe Richaume, Yann H. Kerr, Centre d'Études Spatiales de la BIOsphère, France; Sara Nieto, Susanne Mecklenburg, European Space Agency, Spain*

**MO4.105.2** 16:00 **THE AQUARIUS RFI DETECTION ALGORITHM PARAMETER TUNING PROBLEM**
*Christopher S. Ruf, David D. Chen, University of Michigan, United States; Paolo de Matthaeis, NASA Goddard Space Flight Center, United States*

**MO4.105.3** 16:20 **RFI MITIGATION FOR THE SMAP RADIOMETER: PREPARING FOR CAL/VAL AND OPERATIONS**
*Jeffrey Piepmeier, Priscilla Mohammed, Jinzheng Peng, Derek Hudson, Joel Johnson, NASA Goddard Space Flight Center, United States*

**MO4.105.4** 16:40 **CHARACTERIZATION OF RADIO-FREQUENCY INTERFERENCE IN AMSR2 C-BAND CHANNELS**
*Keiji Imaoka, Misako Kachi, Takashi Maeda, Marehito Kasahara, Norimasa Ito, Japan Aerospace Exploration Agency, Japan*

**MO4.105.5** 17:00 **AN OVERVIEW OF TWO REMOTE SENSING PROJECTS FOR ENHANCING ACCESS TO THE RADIO SPECTRUM (EARS)**
*Albin Gasiewski, University of Colorado at Boulder, United States; Joel Johnson, The Ohio State University, United States; Andrew Clegg, National Science Foundation, United States; Dirk Grunwald, University of Colorado at Boulder, United States; Christopher Baker, Lixin Ye, The Ohio State University, United States*

**Frequency Allocation in Remote Sensing TC Meeting to follow at 17:30.**

Monday, July 22 | 15:40 - 17:20 | Room 106
Session MO4.106 | Oral

### Differential SAR Interferometry II

Session Chair: Paul Rosen, NASA Jet Propulsion Laboratory

**MO4.106.1** 15:40 **SLOW CRUSTAL DEFORMATION OF HAIYUAN FAULT IN THE NORTHEAST TIBETAN PLATEAU OBSERVED BY PS-INSAR**
*Chunyan Qu, Xinjian Shan, Xiaobo Xu, Guohong Zhang, Xiaogang Song, Guifang Zhang, Yunhua Liu, State Key Laboratory of Earthquake Dynamics, Institute of Geology, China Earthquake Administration, China*

**MO4.106.2** 16:00 **CORRECTION OF TROPOSPHERIC PHASE DELAY IN TIME SERIES INSAR USING WRF MODEL FOR MONITORING SHINMOEDAKE VOLCANO**
*Jungkyo Jung, Duk-Jin Kim, Seoul National University, Republic of Korea*

**MO4.106.3** 16:20 **ANALYSIS OF THE SBAS-DINSAR DISPLACEMENT TIME-SERIES ACCURACIES RETRIEVED IN VOLCANIC AREAS THROUGH THE FIRST AND SECOND GENERATION SENSOR SAR DATA**
*Mariarosaria Manzo, Paolo Berardino, Manuela Bonano, Francesco Casu, Michele Manunta, Antonio Pepe, Susi Pepe, Eugenio Sansosti, Giuseppe Solaro, Pietro Tizzani, Giovanni Zeni, IREA-CNR, Italy; Francesco Guglielmino, Giuseppe Puglisi, Prospero De Martino, Francesco Obrizzo, Umberto Tammaro, INGV, Italy; Riccardo Lanari, IREA-CNR, Italy*

**MO4.106.4** 16:40 **CHARACTERIZATION AND IDENTIFICATION OF PARTIALLY CORRELATED PERSISTENT SCATTERERS FOR INSAR REMOTE SENSING**
*Jaime Lien, Howard Zebker, Stanford University, United States*

**MO4.106.5** 17:00 **2-DIMENSIONAL DISPLACEMENT RECOVERY: THE CASE STUDY OF YUSHU EARTHQUAKE, CHINA**
*Runpu Chen, Weidong Yu, Robert Wang, Yunkai Deng, Gang Liu, Yunfeng Shao, Institute of Electronics, Chinese Academy of Sciences, China*

Monday, July 22 13:30 - 15:10 Room 109
Session MO3.109 Oral

## Forest Structure I

**MO3.109.1** 13:30 **RETRIEVAL OF FOREST STRUCTURE AND MOISTURE FROM SAR DATA USING AN ESTIMATION ALGORITHM**
*Daniel Clewley, Mahta Moghaddam, The University of Southern California, United States; Richard Lucas, Peter Bunting, Aberystwyth University, United Kingdom*

**MO3.109.2** 13:50 **FOREST STAND HEIGHT INVERSION USING SPACEBORNE REPEAT-PASS L-BAND INSAR COHERENCE OVER THE US STATE OF MAINE**
*Yang Lei, Paul Siqueira, University of Massachusetts Amherst, United States*

**MO3.109.3** 14:10 **ESTIMATION OF STEM VOLUME IN HEMI-BOREAL FORESTS USING AIRBORNE LOW-FREQUENCY SYNTHETIC APERTURE RADAR AND LIDAR DATA**
*Johan E. S. Fransson, Jörgen Wallerman, Swedish University of Agricultural Sciences, Sweden; Anders Gustavsson, Swedish Defence Research Agency, Sweden; Lars M. H. Ulander, Chalmers University of Technology, Sweden*

**MO3.109.4** 14:30 **DIGITAL CANOPY MODEL ESTIMATION FROM TANDEM-X INTERFEROMETRY WITH HIGH-RESOLUTION LIDAR DEM**
*Maciej Soja, Chalmers University of Technology, Sweden; Lars M. H. Ulander, Swedish Defence Research Agency, Sweden*

**MO3.109.5** 14:50 **ALGORITHM OF LEAF AREA INDEX PRODUCT FOR HJ-CCD OVER HEIHE RIVER BASIN**
*Yanran Liao, Wenjie Fan, Xiru Xu, Peking University, China*

Monday, July 22 13:30 - 15:10 Room 110
Session MO3.110 Oral

## High Resolution Optical Techniques I

Session Co-Chairs: Sebastiano Serpico, University of Genoa; Begüm Demir, University of Trento

**MO3.110.1** 13:30 **ENVIRONMENTAL CHANGE DETECTION TIME SERIES USING 8-BAND WORLDVIEW-2 SATELLITE DATA**
*Leah Glass, Geoimage, Australia*

**MO3.110.2** 13:50 **TREE COVER EXTRACTION FROM 50 CM WORLDVIEW2 IMAGERY: A COMPARISON OF IMAGE PROCESSING TECHNIQUES**
*Niva Kiran Verma, David W. Lamb, Nick Reid, Precision Agriculture Research Group, University of New England, Australia; Brian Wilson, University of New England, Australia*

**MO3.110.3** 14:10 **HYBRID GENERATIVE/DISCRIMINATIVE SCENE CLASSIFICATION STRATEGY BASED ON LATENT DIRICHLET ALLOCATION FOR HIGH SPATIAL RESOLUTION REMOTE SENSING IMAGERY**
*Bei Zhao, Wuhan Univeristy, China; Yanfei Zhong, Wuhan University, China; Liangpei Zhang, Wuhan Univeristy, China*

**MO3.110.4** 14:30 **AN AUTOMATIC ATMOSPHERIC COMPENSATION ALGORITHM FOR VERY HIGH SPATIAL RESOLUTION IMAGERY AND ITS COMPARISON TO QUAC AND FLAASH**
*Fabio Pacifici, DigitalGlobe Inc., United States*

**MO3.110.5** 14:50 **URBAN STRUCTURE DETECTION WITH DEFORMABLE PART-BASED MODELS**
*Hicham Randrianarivo, Bertrand Le Saux, ONERA, France; Marin Ferecatu, CNAM, France*

Monday, July 22 15:40 - 17:20 Room 109
Session MO4.109 Oral

## Forest Structure II

**MO4.109.1** 15:40 **MAUP AND LIDAR DERIVED CANOPY STRUCTURE (A CRCSI 2.07 WOODY ATTRIBUTION PAPER)**
*Phillip Wilkes, Simon Jones, Lola Suarez, RMIT University, Australia; Andrew Haywood, Andrew Mellor, Victorian Department of Sustainability and Environment, Australia; Mariela Soto-Berelov, William Woodgate, RMIT University, Australia*

**MO4.109.2** 16:00 **FOREST CLASSIFICATION IMPROVEMENT USING LIDAR INFORMATION**
*Enguerran Grandchamp, UAG LAMIA, Guadeloupe*

**MO4.109.3** 16:20 **ANALYSIS OF TANDEM-X INSAR DATA AIMED AT THE CHARACTERISATION OF VEGETATION VERTICAL STRUCTURE: A CASE STUDY IN INJUNE (QUEENSLAND, AUSTRALIA)**
*Elsa Carla De Grandi, Richard Lucas, University of Wales, Aberystwyth, United Kingdom; Daniel Clewley, The University of Southern California, United States; Peter Bunting, University of Wales, Aberystwyth, United Kingdom; Edward T. A. Mitchard, The University of Edinburgh, United Kingdom*

**MO4.109.4** 16:40 **SINGLE STRATA CANOPY COVER ESTIMATION USING AIRBORNE LASER SCANNING DATA**
*Antonio Ferraz, Clément Mallet, IGN/SR, Laboratoire MATIS, Université Paris Est, Saint-Mandé, France, France; Gil Gonçalves, Instituto de Engenharia de Sistemas e Computadores de Coimbra, Coimbra, Portugal, Portugal; Margarida Tomé, Paula Soares, Universidade Técnica de Lisboa, Instituto Superior de Agronomia, Centro de Estudos Florestais, Lisboa, Portugal, Portugal; Luisa Pereira, Universidade de Aveiro, Escola Superior de Tecnologia e Gestão de Águeda, Águeda, Portugal, Portugal; Stéphane Jacquemoud, Institut de physique du globe de Paris, Géophysique spatiale et planétaire, Paris, France, France*

**MO4.109.5** 17:00 **A TOPOGRAPHIC CORRECTION METHOD FOR FOREST HEIGHT RETRIEVAL FROM POLARIMETRIC INTERFEROMETRIC SAR IMAGES**
*Yong-sheng Zhou, Chuan-Rong Li, Lingling Ma, Ning Wang, Academy of Opto-Electronics, Chinese Academy of Sciences, China; Qi Liu, Tsinghua University, China*

Monday, July 22 15:40 - 17:20 Room 110
Session MO4.110 Oral

## High Resolution Optical Techniques II

Session Chair: Begüm Demir, University of Trento

**MO4.110.1** 15:40 **COMPARISON OF DIFFERENT FEATURE DETECTORS AND DESCRIPTORS FOR CAR CLASSIFICATION IN UAV IMAGES**
*Thomas Moranduzzo, Farid Melgani, University of Trento, Italy*

**MO4.110.2** 16:00 **FEASIBILITY STUDY OF BUILDING SEISMIC DAMAGE ASSESSMENT USING OBLIQUE PHOTOGRAMMETRIC TECHNOLOGY**
*Xuebin Qin, Qiming Qin, Xiucheng Yang, Jun Wang, Chao Chen, Ning Zhang, Peking University, China*

**MO4.110.3** 16:20 **AUTOMATIC BUILDING EXTRACTION FROM VERY HIGH RESOLUTION SATELLITE IMAGERY USING LINE SEGMENT DETECTOR**
*Jun Wang, Qiming Qin, Li Chen, Xin Ye, Xuebin Qin, Jianhua Wang, Chao Chen, Peking University, China*

**MO4.110.4** 16:40 **MODELLING AND CORRECTION OF INTERIOR ORIENTATION ERROR FOR PRECISE GEOREFERENCING OF SATELLITE IMAGERY**
*Chunsun Zhang, RMIT University, Australia; Clive Fraser, The University of Melbourne, Australia; Shijie Liu, Tongji University, China*

**MO4.110.5** 17:00 **MARGINALIZED KERNEL-BASED FEATURE FUSION METHOD FOR VHR OBJECT CLASSIFICATION**
*Chuntian Liu, Wei Wei, Xiao Bai, Beihang University, China; Jun Zhou, Griffith University, Australia*

Monday, July 22 | 13:30 - 15:10 | Room 111
Session MO3.111 | Oral

## Sea Ice I

Session Chair: Scott Hensley, NASA Jet Propulsion Laboratory

**MO3.111.1 CHARACTERISTICS OF CRYOSAT-2 SIGNALS OVER MULTI-YEAR AND SEASONAL SEA ICE**
13:30
*Justin Beckers, John Alec Casey, University of Alberta, Canada; Stefan Hendricks, Robert Ricker, Veit Helm, Alfred Wegener Institute for Polar and Marine Research, Germany; Christian Haas, York University, Canada*

**MO3.111.2 RADAR INTERFEROMETRIC PENETRATION INTO ARCTIC SEA ICE AT P-BAND AND X-BAND WITH GEOSAR**
13:50
*Scott Hensley, Ben Holt, Sermsak Jaruwatanadilok, Jet Propulsion Laboratory, United States; Jim Reis, Mark Sanford, Joe Jones, Fugro EarthData, United States; Mahoney Andrew, University of Alaska Fairbanks, United States; Khalid Soofi, ConocoPhilips, United States*

**MO3.111.3 COMPARISON OF IN SITU AND AIRBORNE MEASUREMENTS OF MULTI-YEAR SEA ICE THICKNESS WITH DUAL-FREQUENCY, POLARIMETRIC SAR OBSERVATIONS**
14:10
*John Alec Casey, Justin Beckers, University of Alberta, Canada; Thomas Busche, German Aerospace Center (DLR), Germany; Christian Haas, York University, Canada*

**MO3.111.4 A STUDY ON IMPROVING SEA ICE MONITORING WITH SAR DATA AT LAKE SAROMA**
14:30
*Hiroyuki Wakabayashi, Yuta Mori, Kazuki Nakamura, Nihon University, Japan; Kohei Osa, Weathernews Inc., Japan; Kohei Cho, Tokai University, Japan; Chan-Su Yang, Korea Institute of Ocean Science & Technology (KIOST), Republic of Korea*

**MO3.111.5 CHARACTERIZATION OF A SATELLITE-BASED PASSIVE MICROWAVE SEA ICE CONCENTRATION CLIMATE DATA RECORD**
14:50
*Ge Peng, North Carolina State University, United States; Walter Meier, National Snow and Ice Data Center, University of Colorado, United States*

Monday, July 22 | 13:30 - 15:10 | Room 112
Session MO3.112 | Oral

## Geoscience and Remote Sensing in Australasia and Oceania I

**MO3.112.1 THE VARIABILITY OF SATELLITE DERIVED SURFACE BRDF SHAPE OVER AUSTRALIA FROM 2001 TO 2011**
13:30
*Fuqin Li, Geoscience Australia, Australia; David L. B. Jupp, Commonwealth Scientific and Industrial Research Organisation, Australia; Medhavy Thankappan, Geoscience Australia, Australia; Matt Paget, the Commonwealth Scientific and Industrial Research Organisation, Australia; Adam Lewis, Geoscience Australia, Australia; Alex Held, the Commonwealth Scientific and Industrial Research Organisation, Australia*

**MO3.112.2 REMOTE SENSING OF ATMOSPHERIC WATER VAPOUR USING GROUND-BASED GPS MEASUREMENTS FOR CLIMATE APPLICATION IN AUSTRALIA**
13:50
*Suelynn Choy, Royal Melbourne Institute of Technology University, Australia; John Dawson, Minghai Jia, Geoscience Australia, Australia; Yuriy Kuleshov, Bureau of Meteorology, Australia*

**MO3.112.3 MAPPING THE SURFACE EXPRESSION AND VEGETATION COMMUNITIES OF AUSTRALIAN GREAT ARTESIAN BASIN SPRINGS USING HYPERSPECTRAL ANALYSES**
14:10
*Davina White, Megan Lewis, The University of Adelaide, Australia*

**MO3.112.4 WOODY VEGETATION LANDSCAPE FEATURE GENERATION FROM MULTISPECTRAL AND LIDAR DATA (A CRCSI 2.07 WOODY ATTRIBUTION PAPER)**
14:30
*Lola Suarez, Simon Jones, RMIT University, Australia; Andrew Haywood, Department of Sustainability and Environment, Australia; Phillip Wilkes, William Woodgate, Mariela Soto-Berelov, RMIT University, Australia; Andrew Mellor, Department of Sustainability and Environment, Australia*

**MO3.112.5 CORNER REFLECTORS FOR THE AUSTRALIAN GEOPHYSICAL OBSERVING SYSTEM AND SUPPORT FOR CALIBRATION OF SATELLITE-BORNE SYNTHETIC APERTURE RADARS**
14:50
*Matthew Garthwaite, Medhavy Thankappan, Geoscience Australia, Australia; Mark Williams, Horizon Geoscience Consulting, Australia; Shane Nancarrow, Andrew Hislop, John Dawson, Geoscience Australia, Australia*

Monday, July 22 | 15:40 - 17:20 | Room 111
Session MO4.111 | Oral

## Ice Sheets and Glaciers I

**MO4.111.1 TOMOGRAPHIC SAR ANALYSIS OF SUBSURFACE ICE STRUCTURE IN GREENLAND: FIRST RESULTS**
15:40
*Francesco Banda, Politecnico di Milano, Italy; Jørgen Dall, Technical University of Denmark, Denmark; Stefano Tebaldini, Fabio Rocca, Politecnico di Milano, Italy*

**MO4.111.2 ATTEMPT OF ALPINE GLACIER FLOW MODELING BASED ON CORRELATION MEASUREMENTS OF HIGH RESOLUTION SAR IMAGES**
16:00
*Yajing Yan, Laurent Ferro-Famil, IETR, CNRS, Université de Rennes 1, France; Michel Gay, Gipsa-lab, CNRS, Université de Grenoble, France; Renaud Fallourd, Emmanuel Trouvé, Flavien Vernier, LISTIC, Polytech Annecy-Chambéry, France*

**MO4.111.3 PRELIMINARY RESULTS OF THE ICE_SHEET_CCI ROUND ROBIN ACTIVITY ON THE ESTIMATION OF SURFACE ELEVATION CHANGES**
16:20
*Francesca Ticconi, University of Leeds, United Kingdom; Joanna Levinsen, DTU Space, Denmark; Kirill Khvorostovsky, NERSC, Norway; Rene Forsberg, DTU Space, Denmark; Andrew Shepherd, University of Leeds, United Kingdom*

**MO4.111.4 RELATIONSHIP BETWEEN ALTITUDE AND LST DERIVED FROM LANDSAT-TM**
16:40
*Mohd Anul Haq, Kamal Jain, Indian Institute of Technology Roorkee, India; K. P. R. Menon, National Remote Sensing Centre, India*

**MO4.111.5 ICE FLOW MAPPING WITH P-BAND SAR**
17:00
*Jørgen Dall, Ulrik Nielsen, Anders Kusk, Technical University of Denmark, Denmark; Roderik van de Wal, University of Utrecht, Netherlands*

Monday, July 22 | 15:40 - 17:20 | Room 112
Session MO4.112 | Oral

## Big Data and Geoinformation Analytics I

**MO4.112.1 CLOUD DETECTION IN SATELLITE IMAGERY USING GRAPHICS PROCESSING UNITS**
15:40
*Ujwala Bhangale Chaudhari, Surya Durbha, Indian Institute of Technology Bombay, India*

**MO4.112.2 SBAS-DINSAR TIME SERIES GENERATION ON CLOUD COMPUTING PLATFORMS**
16:00
*Stefano Elefante, Pasquale Imperatore, Ivana Zinno, Michele Manunta, National Research Council of Italy, Italy; Emmanuel Mathot, Fabrice Brito, Terradue s.r.l, Italy; Jordi Farres, Wolfgang Lengert, European Space Agency, Italy; Riccardo Lanari, Francesco Casu, National Research Council of Italy, Italy*

**MO4.112.3 THE SPACE GEODESY PROJECT AND RADIO FREQUENCY INTERFERENCE CHARACTERIZATION AND MITIGATION**
16:20
*Lawrence Hilliard, NASA Goddard Space Flight Center, United States; Christopher Beaudoin, Brian Corey, Massachusetts Institute of Technology Haystack Observatory, United States; Cedric Tourain, Centre National d'Etudes Spatiales, France; William Petrachenko, National Research Council Canada, Canada; John Dickey, University of Tasmania, Australia*

**MO4.112.4 GPU RASTERIZATION BASED OCTREE FAST GENERATION ALGORITHM FOR TERRAIN MODELING**
16:40
*Huan Liu, Fan Zhang, Wei Hu, Beijing University of Chemical Technology, China*

Monday, July 22 | 13:30 - 15:10 | Room 207
Session MO3.207 | Oral-Invited

## Geohazard Supersites and Natural Laboratories

**MO3.207.1** 13:30 **THE GEO GEOHAZARDS AND NATURAL LABORATORIES INITIATIVE**
*Jörn Hoffmann, German Aerospace Center (DLR), Germany; Michael Poland, United States Geological Survey, United States*

**MO3.207.2** 13:50 **FUTUREVOLC: A EUROPEAN VOLCANOLOGICAL SUPERSITE OBSERVATORY IN ICELAND, A MONITORING SYSTEM AND NETWORK FOR THE FUTURE**
*Colm Jordan, British Geological Survey, United Kingdom; Freysteinn Sigmundsson, University of Iceland, Iceland; Kristin Vogfjord, Icelandic Meteorological Office, Iceland; Magnus Gudmundsson, University of Iceland, Iceland; Ingvar Kristinsson, Icelandic Meteorological Office, Iceland; Sue Loughlin, Evgenia Ilyinskaya, British Geological Survey, United Kingdom; Andy Hooper, Delft University of Technology, Netherlands; Arve Kylling, Norwegian Institute for Air research, Norway; Claire Witham, UK Meteorological Office, United Kingdom; Chris Bean, Aoife Braiden, University College Dublin, Ireland; Maurizio Ripepe, University of Florence, Italy; Fred Prata Prata, Nicarnica Aviation, Norway; Futurvolc Consortium, FUTURVOLC Team, Iceland*

**MO3.207.3** 14:10 **JAPAN NATURAL LABORATORY: SIGNIFICANCE OF INTEGRATING VARIOUS GEOPHYSICAL DATASETS**
*Yosuke Aoki, University of Tokyo, Japan*

**MO3.207.4** 14:30 **SPACE EARTH OBSERVATION AND GEOHAZARD SCIENTIFIC COMMUNITY**
*Salvatore Stramondo, Giuseppe Puglisi, Massimo Cocco, Istituto Nazionale di Geofisica e vulcanologia, Italy*

Monday, July 22 | 13:30 - 15:10 | Room 208
Session MO3.208 | Oral

## Ocean Biology

**MO3.208.1** 13:30 **AN ANALYSIS OF THE POLARIMETRIC SCATTERING PROPERTIES OF OIL SPILLS ON THE OCEAN SURFACE WITH HYBRID POLARIMETRY SAR**
*HaiYan Li, Key Laboratory of Computational Geodynamics, Chinese Academy of Sciences/Earth Science College, University of Chinese Academy of Sciences; Fisheries and Oceans Canada, Bedford Institute of Oceanography, China; William Perrie, Fisheries and Oceans Canada, Bedford Institute of Oceanography, Canada*

**MO3.208.2** 13:50 **A NOVEL PROCESSING CHAIN INGESTING MULTI-BAND SAR DATA FOR FULLY AUTOMATIC OIL SPILL DETECTION**
*Ruggero Giuseppe Avezzano, Fabio Del Frate, Daniele Latini, Alireza Taravat, University of Rome Tor Vergata, Italy*

**MO3.208.3** 14:10 **MODELING REEF HEALTH FROM UPSTREAM SOCIO-ECOLOGICAL COMPONENTS USING GIS AND RS**
*Robin Pouteau, Institut de Recherche pour le Développement, New Caledonia; Antoine Collin, Tokyo Institute of Technology, Japan; Philippe Archambault, Institut des sciences de la mer de Rimouski, Canada; Benoit Stoll, Université de la Polynésie française, French Polynesia*

**MO3.208.4** 14:30 **ESTIMATING THE DIFFUSE ATTENUATION COEFFICIENT FROM MODERATE-SPATIAL RESOLUTION, MULTI-SPECTRAL SATELLITE DATA IN A SEAGRASS ENVIRONMENT**
*Novi Susetyo Adi, Stuart Phinn, Chris Roelfsema, The University of Queensland, Australia*

**MO3.208.5** 14:50 **NUMERICAL SIMULATION OF PLANKTON DYNAMICS IN THE GULF OF KUTCH**
*Bhaskar Das, Utpal Roy, Visva-Bharati, Santiniketan, India*

Monday, July 22 | 15:40 - 17:20 | Room 207
Session MO4.207 | Oral-Invited

## Ground Measurements for Improving Satellite Precipitation Algorithms

Session Chair: Chandrasekar V Chandra, Colorado State University

**MO4.207.1** 15:40 **VALIDATION CONCEPTS WITH GROUND RADARS FOR GLOBAL PRECIPITATION MISSION DURING THE POST LAUNCH ERA**
*V. Chandrasekar, Haonan Chen, Colorado State University, United States; Luca Baldini, Institude of Atmospheric Sciences and Climate-CNR, Italy; Dmitri Moisseev, University of Helsinki, Finland*

**MO4.207.2** 16:00 **ADVANCED WEATHER RADAR IN AUSTRALIA: OPPORTUNITIES FOR GPM**
*Peter May, Alain Protat, Alan Seed, Beth Ebert, Centre for Australian Weather and Climate Research, Australia*

**MO4.207.3** 16:20 **KA-BAND SENSITIVITY ENHANCEMENT OF THE NASA DUAL-FREQUENCY DUAL-POLARIZED DOPPLER RADAR (D3R) SYSTEM**
*Manuel Vega, NASA Goddard Space Flight Center, United States; V. Chandrasekar, Colorado State University, United States; Mathew Schwaller, NASA Goddard Space Flight Center, United States; James Carswell, Remote Sensing Solutions, United States*

**MO4.207.4** 16:40 **AN OVERVIEW OF GPM ALGORITHM DEVELOPMENT AND VALIDATION PLANS**
*Benjamin Johnson, University of Maryland, Baltimore County, United States; Gail Skofronick-Jackson, William Olson, Robert Meneghini, NASA Goddard Space Flight Center, United States*

**MO4.207.5** 17:00 **VALIDATION OF SATELLITE PRECIPITATION PRODUCT AT AN ARID-SEMIARID BASIN WITH COMPLEX TERRAIN PROPERTIES**
*Bin Peng, State Key Laboratory of Remote Sensing Science, Jointly Sponsored by the Institute of Remote Sensing and Digital Earth of CAS and Beijing Normal University and University of CAS, China; Jiancheng Shi, State Key Laboratory of Remote Sensing Science, Jointly Sponsored by the Institute of Remote Sensing and Digital Earth of CAS and Beijing Normal University, China*

Monday, July 22 | 15:40 - 17:20 | Room 208
Session MO4.208 | Oral-Invited

## Ensuring Credibility of Remote Sensing Data Products

Session Chair: Liping Di, George Mason University

**MO4.208.1** 15:40 **ALGORITHM DEVELOPMENT LIBRARY FOR ENVIRONMENTAL SATELLITE MISSIONS**
*Kerry Grant, Shawn Miller, Michael Jamilkowski, Raytheon Company, United States*

**MO4.208.2** 16:00 **EARTH OBSERVATION SERVICES FOR SECURITY AND EMERGENCY RESPONSE**
*Julia Yagüe, Donata Pedrazzani, GMV Aerospace, Spain*

**MO4.208.3** 16:20 **ENABLING TRANSPARENCY: THE KEY TO CREDIBLE REMOTE SENSING PRODUCTS**
*Lesley Wyborn, Geoscience Australia, Australia; Ryan Fraser, Robert Woodcock, Leo Lymburner, CSIRO Minerals Down Under Flagship, Australia*

**MO4.208.4** 16:40 **PROVENANCE AS A GUIDE TO UNDERSTANDING SCIENCE DATA**
*Helen Conover, Rahul Ramachandran, Kathryn Regner, Michael McEniry, Bruce Beaumont, Sara Graves, University of Alabama-Huntsville, United States; Michael Goodman, NASA Marshall Space Flight Center, United States*

**Data Archiving and Distribution TC Meeting to follow at 17:30.**

Tuesday, July 23 | 08:20 - 10:00 | Room 101
Session TU1.101 | Oral-Invited

## Tropical Rainfall Measurement Mission I

Session Co-Chairs: Chandrasekar V Chandra, Colorado State University; Takuji Kubota, Japan Aerospace Exploration Agency (JAXA)

**TU1.101.1** 08:20 **TRMM STATUS AND SCIENCE ACHIEVEMENTS IN 15 YEARS : JAPANESE PERSPECTIVE**
*Yukari N. Takayabu, The University of Tokyo, Japan; Kenji Nakamura, Nagoya University, Japan; Ken'Ichi Okamoto, Tottori University of Environmental Studies, Japan; Toshio Iguchi, National Institute of Information and Communications Technology, Japan; Kazumasa Aonashi, Meteorological Research Institute, Japan; Shoichi Shige, Kyoto University, Japan; Masafumi Hirose, Meijo University, Japan; Misako Kachi, Takuji Kubota, Riko Oki, Japan Aerospace Exploration Agency, Japan*

**TU1.101.2** 08:40 **TRMM: LOOKING AT PRECIPITATION SYSTEMS THROUGH "MULTIPLE EYES"**
*Erich Stocker, NASA Goddard Space Flight Center, United States; Owen Kelley, George Mason University, United States*

**TU1.101.3** 09:00 **EVALUATION OF TRMM/PR VERSION 7 PRODUCT WITH HIGH-TEMPORAL-RESOLUTION GAUGE DATA OVER JAPAN**
*Shinta Seto, Nagasaki University, Japan; Toshio Iguchi, NICT, Japan; Nobuyuki Utsumi, Taikan Oki, The University of Tokyo, Japan*

**TU1.101.4** 09:20 **REDUCTION OF DISCONTINUITY DUE TO THE ORBIT BOOST IN A TRMM PRECPITATION RADAR PRODUCT FOR CLIMATE STUDIES**
*Satoshi Kida, Takuji Kubota, Misako Kachi, Riko Oki, Japan Aerospace Exploration Agency, Japan; Toshio Iguchi, National Institute of Information and Communications Technology, Japan; Yukari N. Takayabu, The University of Tokyo, Japan*

**TU1.101.5** 09:40 **DEVELOPMENT OF SYNTHETIC GPM/DPR DATA FROM TRMM/PR AND EVALUATION OF GPM/DPR LEVEL-2 "AT-LAUNCH" ALGORITHMS USING THEM**
*Takuji Kubota, Japan Aerospace Exploration Agency, Japan; Naofumi Yoshida, Shinji Urita, Remote Sensing Technology Center of Japan, Japan; Toshio Iguchi, National Institute of Information and Communications Technology, Japan; Shinta Seto, Nagasaki University, Japan; Jun Awaka, Tokai University, Japan; Hiroshi Hanado, National Institute of Information and Communications Technology, Japan; Satoshi Kida, Riko Oki, Japan Aerospace Exploration Agency, Japan*

Tuesday, July 23 | 10:30 - 12:10 | Room 101
Special Session

## Developing SAR for Australia's Earth Observation Needs I

Session Co-Chairs: Tony Milne, Mark Williams, Cooperative Research Centre for Spatial Information

Presentations will address many of the aspects related to progressing the use of SAR for the benefit of Australia's earth observation program. Each presentation will be 15 minutes in duration. At the end of Session II there will be an open forum discussion with a panel of invited specialists.

**A CASE FOR SAR IN AUSTRALIAN EARTH OBSERVATION AND APPLICATIONS**
*Tony Milne, Cooperative Research Centre for Spatial Information, Australia*

**THE GARADA SAR SATELLITE SYSTEM FOR SOIL MOISTURE MONITORING**
*Andrew Dempster, Director, Australian Centre for Space Engineering Research, Australia*

**DSTO SAR: OVERVIEW AND OPPORTUNITIES**
*Nick Stacy, Defence Science & Technology Organisation (DSTO), Australia*

**SAR AND THE EARTH OBSERVATION VALUE CHAIN**
*Mark Watt, CTG Consulting, Australia*

**THE BUSINESS CASE RULES: USER PULL NOT TECHNOLOGY PUSH, PLEASE**
*Brett Biddington, Biddington Research Pty.Ltd., Australia*

**AUSTRALIAN NATIONAL EARTH OBSERVATION INFRASTRUCTURE PLAN**
*Adam Lewis, Geoscience Australia, Australia*

Tuesday, July 23 | 13:30 - 15:10 | Room 101
Special Session

## Developing SAR for Australia's Earth Observation Needs II

Session Co-Chairs: Tony Milne, Mark Williams, Cooperative Research Centre for Spatial Information

Presentations will address many of the aspects related to progressing the use of SAR for the benefit of Australia's earth observation program. Each presentation will be 15 minutes in duration. At the end of Session II there will be an open forum discussion with a panel of invited specialists.

**A NEW NATIONAL FACILITY FOR THE DESIGN, MANUFACTURE AND TEST OF PRECISION INSTRUMENTATION**
*Naomi Mathers, Australian National University, Australia*

**AUSTRALIA AND SAR: INCREMENTAL INVESTMENT**
*John Richards, Australian National University, Australia*

**SAR ACROSS THE WATER, SAR ACROSS THE SKY**
*Paul Rosen, Project Scientist, Jet Propulsion Laboratory, California Institute of Technology, United States*

**NovaSAR: AN APPLICATIONS ORIENTED SPACE RADAR PROJECT**
*Benjamin Stern, Surrey Satellite Technology, Ltd, United Kingdom*

**OPERATING WITHIN THE WorldSAR CONSTELLATION**
*William von Kader, Astrium (Satellites) GmbH, Germany*

**OPEN FORUM: Invited Panel**
*John Richards, Australian National University, Australia*
*Peter Woodgate, Cooperative Research Centre for Spatial Information, Australia*
*Joe Andrews, Australian Space Coordination Office, Australia*

Tuesday, July 23 | 15:40 - 17:20 | Room 101
Session TU4.101 | Oral

## Ocean Temperature and Salinity I

**TU4.101.1** 15:40 **SEA SURFACE TEMPERATURE FROM HY-1B COCTS**
*Lei Guan, Cong Men, Ocean University of China, China*

**TU4.101.2** 16:00 **EVALUATION OF SEA SURFACE SALINITY OBSERVED BY AQUARIUS AND SMOS**
*Naoto Ebuchi, Hiroto Abe, Hokkaido University, Japan*

**TU4.101.3** 16:20 **SHIPBOARD HYPERSPECTRAL RADIOMETRY TO GENERATE A MULTI-SATELLITE CLIMATE DATA RECORD OF SEA-SURFACE TEMPERATURE**
*Peter Minnett, University of Miami, United States; Gary Corlett, University of Leicester, United Kingdom*

**TU4.101.4** 16:40 **SEA SURFACE SALINITY ROUGHNESS CORRECTION AT L-BAND FOR AQUARIUS INSTRUMENT**
*W Linwood Jones, Yazan Hejazin, Salem El-Nimri, University of Central Florida, United States*

**TU4.101.5** 17:00 **S-NPP/VIIRS EDRS – OCEAN PRODUCTS**
*Alexander Ignatov, Menghua Wang, National Oceanic and Atmospheric Administration / NESDIS, United States; Peter Minnett, University of Miami - RSMAS, United States; Robert Arnone, University of Southern Mississippi, United States; Robert Evans, University of Miami - RSMAS, United States; Doug May, NAVOCEANO, United States; Pierre LeBorgne, Météo-France, United States; John Stroup, National Oceanic and Atmospheric Administration / NESDIS, United States; Jean-Francois Cayula, NAVOCEANO, United States; Xingming Liang, Prasanjit Dash, Boris Petrenko, Yury Kihai, Marouan Bouali, Feng Xu, Lide Jiang, Wei Shi, SeungHyun Son, Xiaoming Liu, Liqin Tan, Paul DiGiacomo, John Sapper, National Oceanic and Atmospheric Administration / NESDIS, United States; Giulietta Fargion, University of San Diego, United States; Sherwin Ladner, Paul Martinolich, Naval Research Laboratory, United States*

Tuesday, July 23 | 08:20 - 10:00 | Room 102
Session TU1.102 | Oral

### Hazard/Disaster Mapping

Session Chair: Zhong Lu, U.S. Geological Survey

**TU1.102.1** 08:20 **A NOVEL MICRO-DEFORMATION MONITORING SYSTEM FOR LARGSCALE STRUCTURE**
*Tao Wang, Haiyong Wu, Chongqing University, China; Andrew G Dempster, University of New South Wales, Australia; Chen Su, Hong Zhang, Haisheng Zheng, Chongqing University, China*

**TU1.102.2** 08:40 **WEBGIS-BASED SYSTEM OF "MONITORING AND PREVENTING GEOLOGICAL DISASTER RELY ON THE MASSES"**
*Yuan Qi, Miao Fang, Zhong Zheng, Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences, China*

**TU1.102.3** 09:00 **MULTI-SENSOR SATELLITE IMAGE ANALYSIS FOR FLOOD ASSESSMENT USING IMAGE ALIGNMENT AND CLUSTERING**
*J. Senthilnath, Indian Institute of Science, India; Ram Prasad, Ritwik Rajendra, Shreyas P.B, National Institute of Technology Karnataka, India; S.N. Omkar, V. Mani, Indian Institute of Science, India*

**TU1.102.4** 09:20 **NATIONWIDE MONITORING OF GEOHAZARDS IN GREAT BRITAIN WITH INSAR: FEASIBILITY MAPPING BASED ON ERS-1/2 AND ENVISAT IMAGERY**
*Francesca Cigna, Luke Bateson, Colm Jordan, Claire Dashwood, British Geological Survey, United Kingdom*

**TU1.102.5** 09:40 **DELINEATION OF HYDROCARBON CONTAMINATED SOILS USING OPTICAL AND RADAR IMAGES IN A COASTAL REGION**
*Abdallan Espinosa-Hernandez, Jesus Galvan-Pineda, ESIA Ticoman, National Polytechnic Institute, Mexico; Alejandro Monsivais-Huertero, Jose Carlos Jimenez-Escalona, ESIME Ticoman, National Polytechnic Institute, Mexico; Jose Maria Ramos-Rodriguez, ESIA Ticoman, National Polytechnic Institute, Mexico*

Tuesday, July 23 | 10:30 - 12:10 | Room 102
Session TU2.102 | Oral

### Earthquakes and Crustal Movement

Session Chair: Fumio Yamazaki, Chiba University

**TU2.102.1** 10:30 **ESTIMATION OF THREE-DIMENSIONAL CRUSTAL MOVEMENTS FROM MUTLI-TEMPORAL TERRASAR-X INTENSITY IMAGES**
*Wen Liu, Tokyo Institute of Technology, Japan; Fumio Yamazaki, Chiba University, Japan; Takashi Nonaka, Tadashi Sasagawa, PASCO Corporation, Japan*

**TU2.102.2** 10:50 **RATING THE QUALITY OF POST-DISASTER DAMAGE MAPS: MAPPING BUILDING DAMAGE AFTER THE 2010 HAITI EARTHQUAKE**
*Giles Foody, University of Nottingham, United Kingdom*

**TU2.102.3** 11:10 **STUDY ON THE VULNERABILITY ASSESSMENT OF CATASTROPHE EARTHQUAKE BASED ON RS AND GIS AND ITS PRIMARY APPLICATION**
*Xiaoqing Wang, Aixia Dou, Institute of Earthquake Science, China; Guoqing Sun, Department of Geography, United States; Xiang Ding, Xiang Yuan, Institute of Earthquake Science, China*

**TU2.102.4** 11:30 **SAR IMAGES BEFORE AND AFTER EARTHQUAKE CHANGE DETECTION BASED ON OBJECT ORIENTED METHOD AND DAMAGE EVALUATION**
*Jingfa Zhang, Lixia Gong, Institute of Crustal Dynamics, China Earthquake Administration, China*

**TU2.102.5** 11:50 **AUTOMATED BUILDING DAMAGE CLASSIFICATION FOR THE CASE OF THE 2010 HAITI EARTHQUAKE**
*David Dubois, Richard Lepage, Ecole de technologie superieure, Canada*

Tuesday, July 23 | 13:30 - 15:10 | Room 102
Session TU3.102 | Oral

### Tsunamis & Flooding

Session Chair: Cyrielle Guérin, CEA

**TU3.102.1** 13:30 **SATELLITES AND NATURAL DISASTERS**
*Jack Scott, Space Systems, Thales Australia, Australia*

**TU3.102.2** 13:50 **AUTOMATIC EXTRACTION OF BUILDINGS DAMAGED BY TSUNAMI FOLLOWING 2011 EAST JAPAN EARTHQUAKE USING AERIAL IMAGES**
*Junichi Susaki, Kyoto University, Japan*

**TU3.102.3** 14:10 **DSM GENERATION FROM STEREOSCOPIC IMAGERY FOR DAMAGE MAPPING, APPLICATION ON THE TOHOKU TSUNAMI**
*Cyrielle Guérin, CEA, France; Renaud Binet, CNES, France; Marc Pierrot-Deseilligny, ENSG, France*

**TU3.102.4** 14:30 **SAR AND INSAR FOR FLOOD MONITORING: EXAMPLES WITH COSMO/SKYMED DATA**
*Alberto Refice, CNR-ISSIA, Italy; Domenico Capolongo, Annarita Lepera, University of Bari, Italy; Guido Pasquariello, CNR-ISSIA, Italy; Luca Pietranera, Fabio Volpe, e-GEOS - an ASI/Telespazio Company, Italy; Annarita d'Addabbo, Fabio Bovenga, CNR-ISSIA, Italy*

**TU3.102.5** 14:50 **EXTRACTION OF FLOODED AREAS DUE TO THE 2011 CENTRAL THAILAND FLOOD USING ASTER AND TERRASAR-X DATA**
*Fumio Yamazaki, Jun Shimakage, Wen Liu, Chiba University, Japan; Takashi Nonaka, Tadashi Sasagawa, Pasco Co., Japan*

Tuesday, July 23 | 15:40 - 17:20 | Room 102
Session TU4.102 | Oral

### Volcanism

**TU4.102.1** 15:40 **ANALYSIS OF PYROCLASTIC FLOW MECHANISM IN MERAPI VOLCANO BASED ON PYROCLASTIC MODELING AND REMOTE SENSING INTERPRETATION**
*Herlan Darmawan, Junun Sartohadi, Kirbani Brotopuspito, Universitas Gadjah Mada, Indonesia; Christina Wijayanti, Earth Observatory of Singapore, Singapore*

**TU4.102.2** 16:00 **INSIGHTS INTO ALEUTIAN VOLCANISM FROM INSAR OBSERVATIONS**
*Zhong Lu, Dan Dzurisin, US Geological Survey, United States*

**TU4.102.3** 16:20 **REMOTE SENSING OF VOLCANIC ASH: SYNERGISTIC USE OF ASH MODELS AND MICROWAVE OBSERVATIONS OF THE ERUPTING PLUMES.**
*Mario Montopoli, Michael Herzog, University of Cambridge, United Kingdom; Gianfranco Vulpiani, Department Of Civil Protection, Roma, Italy, Italy; Domenico Cimini, IMAA-CNR, Italy; Frank Marzano, DIET, Sapienza University of Rome, Italy; Hans Graf, University of Cambridge, United Kingdom*

**TU4.102.4** 16:40 **TIME SERIES ANALYSIS FOR MERAPI VOLCANO ERUPTIONS IN INDONESIA**
*Chang-Wook Lee, Minji Cho, National Institution of Meteorological Research (NIMR), Republic of Korea; Zhong Lu, Cascades Volcano Observatory, United States*

**TU4.102.5** 17:00 **THERMAL INFRARED SURVEYS FOR MAPPING SURFACE TEMPERATURE AND SULFUR DIOXIDE PLUMES AT SAKURAJIMA VOLCANO (MINAMIDAKE A-CRATER, SHOWA CRATER) USING THE AIRBORNE HYPERSPECTRAL SCANNER**
*Tetsuya Jitsufuchi, National Research Institute for Earth Science and Disaster Prevention, Japan*

Tuesday, July 23 | 08:20 - 10:00 | Room 103
Session TU1.103 | Oral

### Soil Moisture: Retrieval Algorithms II

Session Co-Chairs: Rocco Panciera, University of Melbourne; Rajat Bindlish, U.S. Department of Agriculture

**TU1.103.1** 08:20 **MODELS OF L-BAND RADAR BACKSCATTERING COEFFICIENTS OVER THE GLOBAL TERRAIN FOR SOIL MOISTURE RETRIEVAL**
*Seung-Bum Kim, Jet Propulsion Laboratory, United States; Mahta Moghaddam, University of Southern California, United States; Leung Tsang, University of Washington, United States; Mariko Burgin, University of Southern California, United States; Xiaolan Xu, Jet Propulsion Laboratory, United States*

**TU1.103.2** 08:40 **VALIDATION OF PHYSICAL MODELS FOR ACTIVE REMOTE SENSING OF VEGETATED SURFACES AT L-BAND FOR SMAP MISSION**
*Tienhao Liao, University of Washington, United States; Xiaolan Xu, Jet Propulsion Laboratory, United States; Leung Tsang, Huanting Huang, University of Washington, United States; Seung-Bum Kim, Eni Njoku, Jet Propulsion Laboratory, United States*

**TU1.103.3** 09:00 **SOIL MOISTURE MAPS FROM TIME SERIES OF PALSAR-1 SCANSAR DATA OVER AUSTRALIA**
*Giuseppe Satalino, Francesco Mattia, Anna Balenzano, Istituto di Studi sui Sistemi Intelligenti per l'Automazione (CNR-ISSIA), Italy; Rocco Panciera, Cooperative Research Center for Spatial Information (CRC-SI), Australia; Jeffrey P. Walker, Monash University, Australia*

**TU1.103.4** 09:20 **ENSEMBLE OF REGRESSORS FOR SOIL MOISTURE RETRIEVAL IN AGRICULTURAL FIELDS**
*Claudia Notarnicola, EURAC-Institute for Applied Remote Sensing, Italy*

**TU1.103.5** 09:40 **INTERCOMPARISON OF SURFACE ROUGHNESS PARAMETERIZATIONS FOR SOIL MOISTURE RETRIEVAL**
*Ying Gao, Jeffrey P. Walker, Monash University, Australia; Dongryeol Ryu, University of Melbourne, Australia; Alessandra Monerris-Belda, Monash University, Australia*

Tuesday, July 23 | 10:30 - 12:10 | Room 103
Session TU2.103 | Oral

### Soil Moisture: Downscaling Approaches

Session Co-Chairs: Dara Entekhabi, Massachusetts Institute of Technology; Ramata Magagi, University of Sherbrooke

**TU2.103.1** 10:30 **SPATIAL DOWNSCALING OF COARSE PASSIVE RADIOMETER SOIL MOISTURE USING RADAR, VEGETATION INDEX AND SURFACE TEMPERATURE**
*Venkat Lakshmi, Bin Fang, Ujjwal Narayan, University of South Carolina, United States*

**TU2.103.2** 10:50 **A DOWNSCALING ALGORITHM FOR COMBINING RADAR AND RADIOMETER OBSERVATIONS FOR SMAP SOIL MOISTURE RETRIEVAL**
*Peng Guo, Jiancheng Shi, Tianjie Zhao, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

**TU2.103.3** 11:10 **DOWNSCALING OF SMOS DERIVED SOIL MOISTURE AND VALIDATION WITH GROUND TRUTH DATA**
*Opn Calla, Abhishek Kalla, Gaurav Rathore, Kishan Lal Gadri, Rahul Sharma, Sunil Kumar Agrahari, International Centre for Radio Science, India*

**TU2.103.4** 11:30 **DISAGGREGATION OF SMOS DERIVED SOIL MOISTURE BY USING MULTIPLICATIVE RANDOM CASCADE METHOD**
*Mehdi Hosseini, Ramata Magagi, Kalifa Goïta, Najib Djamai, Université de Sherbrooke, Centre d'applications et de recherches en télédétection (CARTEL), Canada*

**TU2.103.5** 11:50 **USING ITL CONCEPTS TO DOWNSCALE SMOS SOIL MOISTURE FOR AGRICULTURAL APPLICATIONS**
*Jasmeet Judge, Tara Bongiovanni, Subit Chakrabarty, Jose Principe, University of Florida, United States*

Tuesday, July 23 | 13:30 - 15:10 | Room 103
Session TU3.103 | Oral

### Soil Moisture: Field Experiments

Session Co-Chairs: Venkat Lakshmi, University of South Carolina; Valery Mironov, Kirensky Institute of Physics

**TU3.103.1** 13:30 **HIGH RESOLUTION SOIL MOISTURE ESTIMATES OVER THE MURRUMBIDGEE CATCHMENT USING AIRBORNE AACES DATA**
*Alessandra Monerris-Belda, Christoph Rüdiger, Monash University, Australia; Jean-Pierre Wigneron, INRA/EPHYSE, France; Jeffrey P. Walker, Ying Gao, Monash University, Australia*

**TU3.103.2** 13:50 **TIME-SERIES ANALYSIS OF L-BAND RADAR DATA OVER FORESTED SITES IN SMAPVEX 2012**
*Mariko Burgin, University of Michigan, United States; Ruzbeh Akbar, Mahta Moghaddam, University of Southern California, United States*

**TU3.103.3** 14:10 **RETRIEVAL OF SOIL MOISTURE USING ELECTROMAGNETIC MODELS AND A BAYESIAN APPROACH IN VIEW OF THE SAOCOM MISSION: STUDY ON SARAT IMAGES IN AN AGRICULTURAL SITE IN ARGENTINA**
*Romina Solorza, Instituto Gulich, CONAE, Argentina; Claudia Notarnicola, EURAC, Italy; Haydee Karszenbaum, IAFE, Instituto de Astronomía y Física del Espacio. CONICET/UBA, Argentina*

**TU3.103.4** 14:30 **UTILIZING COMPLEMENTARITY OF ACTIVE/PASSIVE MICROWAVE OBSERVATIONS AT L-BAND FOR SOIL MOISTURE STUDIES IN SANDY SOILS**
*Pang-Wei Liu, Jasmeet Judge, University of Florida, United States; Roger DeRoo, Anthony England, University of Michigan, Ann Arbor, United States; Adam Luke, The Ohio State University, United States*

**TU3.103.5** 14:50 **A NEW METHOD TO DETERMINE THE FREEZE-THAW EROSION**
*Linna Chai, Lixin Zhang, Beijing Normal University, China; Zhenguo Hao, National Calibration Center for Electro-optical Distance Meter, China; Lingmei Jiang, Shaojie Zhao, Xiaokang Kou, Beijing Normal University, China*

Tuesday, July 23 | 15:40 - 17:20 | Room 103
Session TU4.103 | Oral

### Soil Moisture: Radar Parameters

Session Co-Chairs: Claudia Notarnicola, Institute for Applied Remote Sensing; Jiancheng Shi, Institute of Remote Sensing Applications, Chinese Academy of Sciences

**TU4.103.1** 15:40 **SENSITIVITY OF TERRASAR X-BAND DATA TO SURFACE PARAMETERS IN BARE AGRICULTURAL AREAS**
*Rocco Panciera, Fiona MacGill, Mihai A. Tanase, Kim Lowell, The University of Melbourne, Australia; Jeffrey P. Walker, Monash University, Australia*

**TU4.103.2** 16:00 **ANALYSIS AND RETRIEVAL OF SOIL PARAMETERS WITH SPECULAR SCATTERING DATA AT DIFFERENT INCIDENCE ANGLE**
*Rishi Prakash, Graphic Era University, Dehradun, India; Dharmendra Singh, Indian Institute of Technology Roorkee, India; Keshav P Singh, Indian Institute of Technology, India*

**TU4.103.3** 16:20 **SOIL MOISTURE RETRIEVAL IN MODERATELY VEGETATED AREAS VIA A POLARIMETRIC TWO-SCALE MODEL**
*Antonio Iodice, Università degli Studi di Napoli, Federico II, Italy; Antonio Natale, IREA-CNR, Italy; Daniele Riccio, Università degli Studi di Napoli, Federico II, Italy*

**TU4.103.4** 16:40 **MULTI-SOURCE AND MULTI-SCALE SOIL MOISTURE DYNAMIC MODELLING IN MOUNTAIN MEADOWS**
*Luca Pasolli, EURAC-Institute for Applied Remote Sensing, Italy; Giacomo Bertoldi, EURAC-Institute for Alpine Environment, Italy; Stefano Della Chiesa, Georg Niedrist, Ulrike Tappeiner, EURAC-Institute for Alpine Environment-University of Innsbruck, Italy; Marc Zebisch, Claudia Notarnicola, EURAC-Institute for Applied Remote Sensing, Italy*

**TU4.103.5** 17:00 **NEW ADVANCES IN ELECTROMAGNETIC SCATTERING AND INVERSE SCATTERING FROM SUBSURFACE PROFILES**
*Chao Wu, Liting Rao, Shuai Cui, Youcheng Wang, Xiaojuan Zhang, Guangyou Fang, The Institute of Electronics, Chinese Academy of Sciences, China*

Tuesday, July 23 | 08:20 - 10:00 | Room 104
Session TU1.104 | Oral-Invited

### Advanced Methods for Polarimetric Information Extraction

Session Co-Chairs: Simon Yueh, NASA Jet Propulsion Laboratory; Yoshio Yamaguchi, Niigata University

**TU1.104.1** 08:20 **GENERAL FOUR-COMPONENT SCATTERING POWER DECOMPOSITION**
*Gulab Singh Singh, Yoshio Yamaguchi, Sang-Eun Park, Niigata University, Japan*

**TU1.104.2** 08:40 **EFFECTIVE MONITORING FOR MARINE DEBRIS AFTER THE GREAT EAST JAPAN EARTHQUAKE BY USING POLARIMETRIC SAR DATA**
*Motofumi Arii, Masakazu Koiwa, Yoshifumi Aoki, Mitsubishi space software co., ltd., Japan*

**TU1.104.3** 09:00 **DETERMINATION OF TUNAMI-AFFECTED AREAS BY POLARIMETRIC SAR**
*Motoyuki Sato, Si-Wei Chen, Tohoku University, Japan*

**TU1.104.4** 09:20 **INITIAL ANALYSIS OF THE POLARIZATION PROPERTIES OF ONE YEAR OF AQUARIUS DATA**
*Jakob van Zyl, Yunjin Kim, Simon Yueh, Jet Propulsion Laboratory, United States*

**TU1.104.5** 09:40 **EVALUATION OF CLASSIFIERS FOR POLARIMETRIC SAR CLASSIFICATION**
*Stefan Uhlmann, Serkan Kiranyaz, Tampere University of Technology, Finland*

Tuesday, July 23 | 10:30 - 12:10 | Room 104
Session TU2.104 | Oral

### GIS Applications I

Session Chair: Meixia Deng, George Mason University

**TU2.104.1** 10:30 **COMPREHENSIVE SUITABILITY EVALUATION OF ALFALFA CULTIVATION USING GIS AND RS: A CASE STUDY IN DUOLUN, CHINA**
*Fei Deng, Xiaobing Li, Hong Wang, Guoqing Li, Meng Zhang, Beijing Normal University, China*

**TU2.104.2** 10:50 **LOCATION ANALYSIS OF ISLANDS TO WATERWAYS BASED ON ISLANDS SPATIAL INTERACTION MODEL**
*Wei Shi, State Key Laboratory of Resources and Environmental Information Systems, Institute of Geographic Sciences and Nature Resources Research, CAS; University of Chinese Academy of Science, China; Fenzhen Su, State Key Laboratory of Resources and Environmental information System, Institute of Geographic Sciences and Natural Resources Research, CAS, China; Ruirui Wang, Beijing Forestry University, China*

**TU2.104.3** 11:10 **RESEARCH OF SPATIAL TOPOLOGICAL RELATION MODEL BASED ON GEOSOT**
*Dong Chen, Chengqi Cheng, Shuhua Song, Fang Dong, Peking University, China; Runqiang Chen, Beijing Institute of Applied Meteorology, China*

**TU2.104.4** 11:30 **TRIANGULAR-PRISM-BASED ALGORITHM ON URBAN FLOOD INUNDATION SIMULATION BY EMPLOYING DICHOTOMY NUMERICAL SOLUTION**
*Zhifeng Li, Lixin Wu, Beijing Normal University, China; Zhenxin Zhang, China University of Mining and Technology, China; Zhihua Xu, Zhi Wang, Beijing Normal University, China*

**TU2.104.5** 11:50 **A QUICK SCREENING METHOD: MODELING TREE SPECIES SPATIAL PATTERNS USING DEM AND WORLDVIEW-II IMAGE**
*Hou-Chang Chen, Nan-Chang Lo, Chung-Hsing University, Taiwan; Wei-I Chang, Forest Bureau, Council of Agriculture, Taiwan; Kai-Yi Huang, Chung-Hsing University, Taiwan*

Tuesday, July 23 | 13:30 - 15:10 | Room 104
Session TU3.104 | Oral-Invited

### Local and Regional Applications of Integrated In-situ and Remote Sensing Data I

Session Chair: Kathy Fontaine, National Aeronautics and Space Administration

**TU3.104.1** 13:30 **OBSERVATION INTEGRATION ACROSS DISCIPLINES IN THE GEOSS ARCHITECTURE IMPLEMENTATION PILOT (AIP)**
*George Percivall, Bart de Lathouwer, Open Geospatial Consortium, United States*

**TU3.104.2** 13:50 **APPLYING SENSOR WEB STRATEGIES TO BIG DATA EARTH OBSERVATIONS**
*Terence van Zyl, Graeme McFerren, Council for Scientific and Industrial Research, South Africa*

**TU3.104.3** 14:10 **FLOOD, FIRE AND DROUGHT: APPROACHES TO TRACKING CONTINENTAL SCALE ENVIRONMENTAL CHANGE WITH TIME-SERIES REMOTE SENSING**
*Stuart Minchin, Adam Lewis, Geoscience Australia, Australia*

**TU3.104.4** 14:30 **GEO BIODIVERSITY OBSERVATION NETWORK**
*Simon Ferrier, CSIRO Ecosystem Sciences, Australia; Gary Geller, NASA Jet Propulsion Laboratory, United States*

**TU3.104.5** 14:50 **MONITORING OF DEGRADING GRASSLAND BASED ON HJ-1A-HSI IMAGE**
*Chen Gaoxing, Fan Wenjie, Xu Xiru, Peking University, China; Deng Mengzhi, Henan Agriculture University, China*

Tuesday, July 23 | 15:40 - 17:20 | Room 104
Session TU4.104 | Oral-Invited

### Local and Regional Applications of Integrated In-situ and Remote Sensing Data II

Session Chair: Miriam Baltuck, CSIRO

**TU4.104.1** 15:40 **THE GLOBAL FOREST OBSERVATIONS INITIATIVE**
*Miriam Baltuck, Commonwealth Scientific and Industrial Research Organisation, Australia; Andrew McGee, Department of Climate Change and Energy Efficiency, Australia; Stephen Briggs, European Space Agency, United Kingdom; Mette Loyche-Wilkie, Food and Agriculture Organization of the United Nations, Italy; Doug Muchoney, United States Geological Survey, United States; Per Erik Skrøvseth, Norwegian Space Centre, Norway*

**TU4.104.2** 16:00 **GEO-GLAM: THE GEO GLOBAL AGRICULTURAL MONITORING INITIATIVE**
*Inbal Becker-Reshef, Christopher Justice, University of Maryland, United States; Joao Soares, Group on Earth Observations, Switzerland*

**TU4.104.3** 16:20 **THE EO-BASED AGRICULTURAL CROP CONDITION MONITOR IN GEOSS AIP**
*Liping Di, Genong Yu, George Mason University, United States*

**TU4.104.4** 16:40 **MONITORING VEGETATION DYNAMICS FROM AUTOMATED IN-SITU TERRESTRIAL LIDAR**
*Darius Culvenor, Glenn Newnham, CSIRO Land and Water, Australia; Andrew Mellor, Andrew Haywood, Department of Environment and Primary Industries, Australia*

**TU4.104.5** 17:00 **GROUND EXPERIMENTS TO DECOMPOSITION OF MIXED PIXELS FOR ESTIMATION OF GRASSLAND VEGETATION COVER FRACTION**
*Fei Li, Bingfang Wu, Qiang Xing, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

Tuesday, July 23 | 08:20 - 10:00 | Room 105
Session TU1.105 | Oral-Invited

## Local and Regional Applications of Integrated In-situ and Remote Sensing Data III

**TU1.105.1** 08:20 **TOWARDS A SENSOR WEB ARCHITECTURE FOR DISASTER MANAGEMENT: INSIGHTS FROM THE NAMIBIA FLOOD PILOT**
*Stuart Frye, Stinger Ghaffarian Technologies, Inc., United States; Karen Moe, Dan Mandl, Matt Handy, NASA, United States; George Percivall, The Open Geospatial Consortium, United States; John Evans, Global Science & Technology, Inc., United States*

**TU1.105.2** 08:40 **INTEGRATING REMOTE SENSING AND SUPER-LOW FREQUENCY ELECTROMAGNETIC TECHNOLOGY IN EXPLORATION OF BURIED FAULTS**
*Li Chen, Qiming Qin, Yanbing Bai, Nan Wang, Jun Wang, Chao Chen, Institute of Remote Sensing and Geographic Information System, Peking University, China*

**TU1.105.3** 09:00 **SENSOR WEB APPROACH TO FLOOD MONITORING AND RISK ASSESSMENT**
*Nataliia Kussul, Sergii Skakun, Andrii Shelestov, Space Research Institute NASU-SSAU, Ukraine; Olga Kussul, National Technical University of Ukraine "Kyiv Polytechnic Institute", Ukraine*

**TU1.105.4** 09:20 **THE QUANTITATIVE PREDICTION OF COALBED METHANE GAS CONTENT BASED ON SUPER-LOW FREQUENCY ELECTROMAGNETIC TECHNOLOGY**
*Yanbing Bai, Qiming Qin, Li Chen, Nan Wang, Jianhua Wang, Chao Chen, Peking University, China*

**TU1.105.5** 09:40 **A NOVEL HIERARCHICAL METHOD FOR CHANGE DETECTION IN MULTITEMPORAL HYPERSPECTRAL IMAGES**
*Sicong Liu, Lorenzo Bruzzone, Francesca Bovolo, University of Trento, Italy; Peijun Du, Nanjing University, China*

Tuesday, July 23 | 10:30 - 12:10 | Room 105
Session TU2.105 | Oral-Invited

## GCOM-Global Change Observation Mission

Session Co-Chairs: Paul Chang, National Oceanic and Atmospheric Administration (NOAA); Haruhisa Shimoda, Japan Aerospace Exploration Agency (JAXA)

**TU2.105.1** 10:30 **OVERVIEW OF GCOM**
*Haruhisa Shimoda, Japan Aerospace Exploration Agency, Japan*

**TU2.105.2** 10:50 **GCOM-W1 STATUS AND AMSR2 CALIBRATION RESULTS**
*Keiji Imaoka, Takashi Maeda, Arata Okuyama, Marehito Kasahara, Norimasa Ito, Susumu Saitoh, Toshiaki Takeshima, Japan Aerospace Exploration Agency, Japan*

**TU2.105.3** 11:10 **AMSR2 VALIDATION RESULTS**
*Misako Kachi, Kazuhiro Naoki, Masahiro Hori, Keiji Imaoka, Japan Aerospace Exploration Agency, Japan*

**TU2.105.4** 11:30 **NOAA GCOM-W1/AMSR2 PRODUCT PROCESSING AND VALIDATION SYSTEM**
*Paul Chang, Zorana Jelenak, National Oceanic and Atmospheric Administration, United States*

**TU2.105.5** 11:50 **OVERVIEW OF GCOM-C1/SGLI AND VALIDATION**
*Yhosiaki Honda, Koji Kajiwara, Chiba University, Japan*

Tuesday, July 23 | 13:30 - 15:10 | Room 105
Session TU3.105 | Oral-Invited

## Remote Sensing Instruments and Technologies for Small Satellites I

Session Co-Chairs: William Blackwell, MIT Lincoln Laboratory; Boon Lim, NASA Jet Propulsion Laboratory

**TU3.105.1** 13:30 **JAXA'S TECHNOLOGY DEMONSTRATION MISSION SDS-4**
*Moto Takai, Takashi Ohtani, Yosuke Nakamura, Yasuyuki Takahashi, Koichi Inoue, Japan Aerospace Exploration Agency, Japan*

**TU3.105.2** 13:50 **CAT-2: A P(Y) AND C/A GNSS-R EXPERIMENTAL NANO-SATELLITE MISSION**
*Hugo Carreno-Luengo, Adriano Camps, Isaac Perez-Ramos, Giuseppe Forte, Raul Onrubia, Raul Diez, Universitat Politècnica de Catalunya (UPC), Spain*

**TU3.105.3** 14:10 **PREPARATIONS FOR THE MICROMAS CUBESAT MISSION**
*William Blackwell, G. Allen, C. Galbraith, R. Leslie, I. Osaretin, B. Reid, M. Scarito, M. Shields, E. Thompson, D. Toher, D. Townzen, Massachusetts Institute of Technology Lincoln Laboratory, United States; Kerri Cahoy, David Miller, Massachusetts Institute of Technology, United States*

**TU3.105.4** 14:30 **DEVELOPMENT OF THE RADIOMETER ATMOSPHERIC CUBESAT EXPERIMENT PAYLOAD**
*Boon Lim, Michael Shearn, Douglas E. Dawson, Jet Propulsion Laboratory, United States; Chaitali Parashare, California Institute of Technology, United States; Andrew Romero-Wolf, Damon Russell, Joel Steinkraus, Jet Propulsion Laboratory, United States*

**TU3.105.5** 14:50 **USING CUBESATS AS PLATFORMS FOR REMOTE SENSING WITH SATELLITE NAVIGATION SIGNALS**
*Li Qiao, Eamonn Glennon, Andrew G Dempster, University of New South Wales, Australia; Sebastian Chaoui, University of Technology, Sydney, Australia*

Tuesday, July 23 | 15:40 - 17:20 | Room 105
Session TU4.105 | Oral

## Pansharpening and Image Processing

Session Chair: Jon Atli Benediktsson, University of Iceland

**TU4.105.1** 15:40 **PANSHARPENING VIA SPARSITY OPTIMIZATION USING OVERCOMPLETE TRANSFORMS**
*Frosti Palsson, Johannes R. Sveinsson, Magnus O. Ulfarsson, Jon Atli Benediktsson, University of Iceland, Iceland*

**TU4.105.2** 16:00 **SPARSE REPRESENTATION BASED PAN-SHARPENING**
*Wen Yin, Yuanxiang Li, Wenxian Yu, Shanghai Jiao Tong University, China*

**TU4.105.3** 16:20 **COLOR CONSTANCY ENHANCEMENT FOR MULTI-SPECTRAL REMOTE SENSING IMAGES**
*Mi Wang, Xinghui Zheng, Chunhui Feng, State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University, China*

**TU4.105.4** 16:40 **COLLABORATIVE SPARSE RECONSTRUCTION FOR PAN-SHARPENING**
*Xiao Xiang Zhu, Claas Grohnfeldt, Richard Bamler, German Aerospace Center (DLR), Germany*

**TU4.105.5** 17:00 **ADAPTIVE BASIS PURSUIT COMPRESSIVE SENSING RECONSTRUCTION WITH HISTOGRAM MATCHING**
*Luca Lorenzi, University of Trento, Italy; Grégoire Mercier, Telecom Bretagne, France; Farid Melgani, University of Trento, Italy*

Tuesday, July 23 | 08:20 - 10:00 | Room 106
Session TU1.106 | Oral

## Differential SAR Interferometry III

Session Co-Chairs: Paul Rosen, NASA Jet Propulsion Laboratory; Stefano Tebaldini, Politecnico di Milano

**TU1.106.1** 08:20 **ENHANCED PSP SAR INTERFEROMETRY FOR ANALYSIS OF WEAK SCATTERERS AND HIGH DEFINITION MONITORING OF DEFORMATIONS OVER STRUCTURES AND NATURAL TERRAINS**
*Mario Costantini, Federico Minati, Francesco Trillo, Francesco Vecchioli, e-GEOS - an ASI/ Telespazio Company, Italy*

**TU1.106.2** 08:40 **A FULL EXPLOITATION OF THE ENHANCED SBAS-DINSAR APPROACH IN VOLCANIC AND SEISMOGENIC AREAS**
*Riccardo Lanari, Mariarosaria Manzo, Antonio Pepe, IREA-CNR, Italy; Yang Yang, IREA-CNR / National University of Defense Technology - China, Italy; Pietro Tizzani, Giovanni Zeni, IREA-CNR, Italy*

**TU1.106.3** 09:00 **NEW ALGORITHM FOR INSAR STACK PHASE TRIANGULATION USING INTEGER LEAST SQUARES ESTIMATION**
*Sami Samiei-Esfahany, Ramon F. Hanssen, Delft University of Technology, Netherlands*

**TU1.106.4** 09:20 **OPERATIONAL STACKING OF TERRASAR-X SCANSAR AND TOPS DATA**
*Nestor Yague-Martinez, Technische Universität München (TUM), Germany; Ulrich Balss, Helko Breit, Fernando Rodriguez Gonzalez, Thomas Fritz, Marie Lachaise, Nico Adam, German Aerospace Center (DLR), Germany*

**TU1.106.5** 09:40 **SPARSITY ANALYSIS OF SAR SIGNAL AND THREE-DIMENSIONAL IMAGING OF SPARSE ARRAY SAR**
*Daojing Li, Qingjuan Zhang, Liechen Li, Institute of Electronics, Chinese Academy of Sciences, China; Ying Xi, National Space Science Center, Chinese Academy of Sciences, China*

Tuesday, July 23 | 10:30 - 12:10 | Room 106
Session TU2.106 | Oral

## High Resolution SAR I

Session Chair: Akira Hirose, University of Tokyo

**TU2.106.1** 10:30 **CHARACTERIZATION AND EXTRACTION OF BUILDING LAYOVERS IN URBAN AREAS USING HIGH RESOLUTION SAR IMAGERY**
*Bin Liu, Shanghai Jiao Tong University, China; Florence Tupin, Telecom ParisTech, France; Xingzhao Liu, Wenxian Yu, Shanghai Jiao Tong University, China*

**TU2.106.2** 10:50 **SIMULATION-BASED CHARACTERIZATION OF SAR IMAGE SIGNATURE PATTERNS RELATED TO BUILDING FACADES**
*Stefan Auer, Technische Universität München (TUM), Germany; Junyi Tao, Richard Bamler, German Aerospace Center (DLR), Germany*

**TU2.106.3** 11:10 **A NEW APPROACH FOR SPOTLIGHT GEOSYNCHRONOUS SAR DATA FOCUSING**
*Zhao Bingji, Qi Xiangyang, Song Hongjun, Wang Robert, Zhang Zhiguang, Jiang Hai, Institute of Electronics, Chinese Academy of Sciences, China*

**TU2.106.4** 11:30 **SIGNATURE ANALYSIS OF DESTROYED BUILDINGS IN SIMULATED HIGH RESOLUTION SAR DATA**
*Silvia Kuny, Karsten Schulz, Horst Hammer, Fraunhofer IOSB, Germany*

**TU2.106.5** 11:50 **NEW DETECTOR BASED ON PATCH SEGMENTATION FOR HIGH RESOLUTION SAR IMAGE**
*Bo Zhang, Chao Wang, Fan Wu, Hong Zhang, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

Tuesday, July 23 | 13:30 - 15:10 | Room 106
Session TU3.106 | Oral

## High Resolution SAR II

Session Chair: Akira Hirose, University of Tokyo

**TU3.106.1** 13:30 **HIGH RESOLUTION SAR FOR MONITORING OF RESERVOIRS SEDIMENTATION AND SOIL EROSION IN SEMI ARID REGIONS**
*Donato Amitrano, Gerardo Di Martino, Antonio Iodice, Daniele Riccio, Giuseppe Ruello, University of Napoli, Italy; Maria Nicolina Papa, Fabio Ciervo, University of Salerno, Italy; Youssouf Koussoube, University of Ouagadougou, Burkina Faso*

**TU3.106.2** 13:50 **A FAST RAW DATA SIMULATOR FOR STRIPMAP SAR BASED ON CUDA VIA GPU**
*Hui Sheng, Kaizhi Wang, Xingzhao Liu, Jianjun Li, Shanghai Jiao Tong University, China*

**TU3.106.3** 14:10 **SYNTHETIC APERTURE IMAGING USING A RANDOMLY STEERED SPOTLIGHT**
*Dehong Liu, Petros T. Boufounos, Mitsubishi Electric Research Laboratory, United States*

**TU3.106.4** 14:30 **RADAR TARGET TYPE CLASSIFICATION AND VALIDATION**
*Prabu Dheenathayalan, Ramon Hanssen, Delft University of Technology, Netherlands*

**TU3.106.5** 14:50 **A REFINED THREE-STEP FOCUSING ALGORITHM BASED ON SPATIAL VARIATION CHARACTERISTIC OF SPACEBORNE SLIDING SPOTLIGHT SAR**
*Wei-Jie Wang, Chun-Sheng Li, Peng-Bo Wang, Jian Zhou, Wei Yang, Jie Chen, Beihang University, China*

Tuesday, July 23 | 15:40 - 17:20 | Room 106
Session TU4.106 | Oral

## Airborne SAR

Session Co-Chairs: Andreas Reigber, German Aerospace Center (DLR); Hubert Cantalloube, Office National d'Etudes et Recherches Aerospatial

**TU4.106.1** 15:40 **ACQUISITION, PROCESSING & AUTOFOCUS ISSUES OF HIGH RESOLUTION LONG RANGE AIRBORNE SYNTHETIC APERTURE RADAR**
*Hubert Cantalloube, Office National d'Etudes et Recherches Aerospatiales, France*

**TU4.106.2** 16:00 **A REFINED OMEGA-K ALGORITHM FOR FOCUSING HIGHLY SQUINT AIRBORNE STRIPMAP SAR DATA**
*Hong-Cheng Zeng, Jie Chen, Wei Yang, Beihang University, China; Zhong-Ma Cui, China Aerospace Science & Industry, China; Hao-Jie Zhang, Beihang University, China*

**TU4.106.3** 16:20 **PRECISE AZIMUTH-TO-FREQUENCY MAPPING FOR EFFECTIVE AND EFFICIENT COMPENSATION OF MOTION ERRORS IN AIRBORNE SAR**
*Stefano Perna, IREA-CNR; Università Parthenope, Italy; Paolo Berardino, IREA-CNR, Italy; Carmen Esposito, IREA-CNR; Università degli Studi del Sannio, Italy; Gianfranco Fornaro, Riccardo Lanari, Antonio Pauciullo, IREA-CNR, Italy; Christian Wimmer, Orbisat Remote Sensing, Brazil; Virginia Zamparelli, IREA-CNR; Università degli Studi del Sannio, Italy*

**TU4.106.4** 16:40 **VARIABLE-APERTURE-BP-BASED NEAR SPACE SLOW SPEED SAR IMAGING**
*Jianyu Yang, Wenchao Li, Yulin Huang, Haiguang Yang, Ye Yuan, Leiquan Song, University of Electronic Science and Technology of China, China*

**TU4.106.5** 17:00 **SPARSE IMAGING BASED ON SAR COMPLEX IMAGE DOMAIN**
*Wentao Lv, Junfeng Wang, Lizhong Qiu, Wenxian Yu, Shanghai Jiao Tong University, China*

Tuesday, July 23 | 08:20 - 10:00 | Room 109
Session TU1.109 | Oral

### Forest Biomass I

Session Co-Chairs: Scott Hensley, NASA Jet Propulsion Laboratory; Fuqin Li, Geoscience Australia

**TU1.109.1** 08:20 **AN ANALYSIS OF UNCERTAINTY IN THE BACKSCATTER BIOMASS RELATIONSHIP**
*Razi Ahmed, Scott Hensley, Jet Propulsion Laboratory, United States; Paul Siqueira, University of Massachusetts, United States*

**TU1.109.2** 08:40 **ESTIMATION OF FOREST BIOMASS FROM L-BAND POLARIMETRIC DECOMPOSITION COMPONENTS**
*Mihai A. Tanase, Rocco Panciera, Kim Lowell, The University of Melbourne, Australia; Jorg M. Hacker, Flinders University, Australia; Jeffrey P. Walker, Monash University, Australia*

**TU1.109.3** 09:00 **ESTABLISHING THE SENSITIVITY OF ALOS PALSAR TO ABOVE GROUND WOODY BIOMASS: A CASE STUDY IN THE PINE SAVANNAS OF BELIZE, CENTRAL AMERICA**
*Dimitrios Michelakis, Neil Stuart, Iain H. Woodhouse, The University of Edinburgh, United Kingdom; German Lopez, The University of Belize, Belize; Vinicio Linares, SCOPEinsight, Netherlands*

**TU1.109.4** 09:20 **RELATING AMAZON FOREST BIOMASS TO POLINSAR EXTRACTED FEATURES**
*Carlos Alberto Pires de Castro-Filho, Geographic Service of the Brazilian Army, Brazil; Corina Da Costa Freitas, National Institute for Space Research - INPE, Brazil; Sidnei João Siqueira Sant'Anna, Instituto Nacional de Pesquisas Espaciais, Brazil; Adriano José Nogueira Lima, Niro Higuchi, National Institute for Amazon Research, Brazil*

**TU1.109.5** 09:40 **CREATING MULTI-SENSOR TIME SERIES USING DATA FROM LANDSAT-5 TM AND LANDSAT-7 ETM+ TO CHARACTERISE VEGETATION DYNAMICS**
*Leo Lymburner, Alexis McIntyre, Fuqin Li, Alex Ip, Medhavy Thankappan, Joshua Sixsmith, Geoscience Australia, Australia*

Tuesday, July 23 | 10:30 - 12:10 | Room 109
Session TU2.109 | Oral

### Forest Biomass II

Session Co-Chairs: David Goodenough, University of Victoria; Takeshi Motooka, Japan Aerospace Exploration Agency (JAXA)

**TU2.109.1** 10:30 **ABOVEGROUND CARBON ESTIMATION OF FORESTS**
*David Goodenough, Piper Gordon, University of Victoria, Canada; Hao Chen, Pacific Forestry Centre, Canada; K. Olaf Niemann, Xiao Ma, University of Victoria, Canada*

**TU2.109.2** 10:50 **MAPPING FOREST BIOMASS USING ALOS DIGITAL SURFACE MODEL AND PAN-SHARPEN IMAGE**
*Takeshi Motooka, Japan Aerospace Exploration Agency, Japan; Toshiya Yoshida, Hideaki Shibata, Hokkaido University, Japan; Takeo Tadono, Masanobu Shimada, Japan Aerospace Exploration Agency, Japan*

**TU2.109.3** 11:10 **ESTIMATION OF ABOVE-GROUND CARBON STOCKS IN EUCALYPTUS PLANTATIONS USING LIDAR**
*Carlos Silva, Carine Klauberg, Samuel Carvalho, Luiz Rodriguez, University of Sao Paulo, Brazil*

**TU2.109.4** 11:30 **FUSING RADAR AND OPTICAL REMOTE SENSING FOR BIOMASS PREDICTION IN MOUNTAINOUS TROPICAL FORESTS**
*Melissa Fedrigo, The University of Melbourne, Australia; Patrick Meir, Australian National University, Australia; Douglas Sheil, School of Environmental Science and Management, Australia; Miriam van Heist, Institute of Tropical Forest Conservation, Australia; Iain H. Woodhouse, Edward T. A. Mitchard, The University of Edinburgh, United Kingdom*

**TU2.109.5** 11:50 **REGIONAL FOREST ABOVE-GROUND BIOMASS RETRIEVAL BY OPTIMIZED K-NN ALGORITHM IN NORTHEAST CHINA**
*Xin Tian, Erxue Chen, Zengyuan Li, Chinese Academy of Forestry, China; Z.Bob Su, University of Twente, Netherlands; Lina Bai, Chinese Academy of Forestry, China; Christiaan van der Tol, University of Twente, Netherlands*

Tuesday, July 23 | 13:30 - 15:10 | Room 109
Session TU3.109 | Oral

### Forests I

Session Chair: Francesco Montomoli, CNR-IFAC

**TU3.109.1** 13:30 **TEMPORAL DECORRELATION OF POLARIMETRIC P-BAND ELECTROMAGNETIC SCATTERING OF TROPICAL FORESTS**
*Alia Hamadi, Clément Albinet, CESBIO, Universite De Toulouse, France; Pierre Borderies, Onera toulouse france, France; Thierry Koleck, CNES Toulouse France, France; Ludovic Villard, Thuy Letoan, CESBIO, Universite De Toulouse, France; Fabio Rocca, Stefano Tebaldini, Dinh Ho Tong Minh, Politecnico di milano, Italy*

**TU3.109.2** 13:50 **ELECTROMAGNETIC SIMULATION AND VALIDATION OF BACKSCATTERING FROM BOREAL FOREST IN THE C-KU FREQUENCY RANGE**
*Francesco Montomoli, Marco Brogioni, Giacomo Fontanelli, IFAC-CNR, Italy; Alberto Toccafondi, University of Siena, Italy; Juha Lemmetyinen, Jouni Pulliainen, Finnish Metereological Institute, Finland; Irena Hajnsek, German Aerospace Center (DLR), Germany; Giovanni Macelloni, IFAC-CNR, Italy*

**TU3.109.3** 14:10 **AIRBORNE FOREST MONITORING DURING THE SMAPEX-3 CAMPAIGN**
*Cristina Vittucci, Leila Guerriero, Paolo Ferrazzoli, Rachid Rahmoune, University of Rome Tor Vergata, Italy; Mihai A. Tanase, Rocco Panciera, The University of Melbourne, Australia; Alessandra Monerris-Belda, Christoph Rüdiger, Jeffrey P. Walker, Monash University, Australia*

**TU3.109.4** 14:30 **MAPPING LONG-TERM WOODY ENCROACHMENT AND DEFORESTATION/DEGRADATION IN AFRICA USING MODIS NDVI**
*Edward T. A. Mitchard, The University of Edinburgh, United Kingdom; Clara Flintrop, University of Edinburgh, United Kingdom; France Gerard, Centre for Ecology & Hydrology, United Kingdom; Patrick Meir, University of Edinburgh, United Kingdom; Sassan Saatchi, Jet Propulsion Laboratory, United States*

**TU3.109.5** 14:50 **TEMPERATE FOREST ABOVEGROUND BIOMASS ESTIMATION BY MEANS OF MULTI-SENSOR FUSION: THE DAXINGANLING CAMPAIGN**
*Yong Pang, Zengyuan Li, Kairui Zhao, Erxue Chen, Chinese Academy of Forestry, China; Guoqing Sun, University of Maryland, United States*

Tuesday, July 23 | 15:40 - 17:20 | Room 109
Session TU4.109 | Oral

### Forests II

Session Co-Chairs: Andrew Dempster, University of New South Wales; Taichi Takayama, Mitsubishi Research Institute, Inc.

**TU4.109.1** 15:40 **EXTRACTION OF BURNED FOREST AREA IN THE GREATER HINGGAN MOUNTAIN OF CHINA BASED ON LANDSAT TM DATA**
*Wei Chen, Tetsuro Sakai, Kazuyuki Moriya, Lina Koyama, Graduate School of Informatics, Kyoto University, Japan; Chunxiang Cao, the Institute of Remote Sensing and Digital Earth of Chinese Academy of Sciences and Beijing Normal University, China*

**TU4.109.2** 16:00 **ESTIMATING FOREST CANOPY DENSITY USING LANDSAT TM DATA BASED ON SUB-COMPARTMENT OBJECTS**
*Cunjian Yang, He Huang, Shaou Han, Jing Ni, Sichuan Normal University, China*

**TU4.109.3** 16:20 **FOREST CHANGE DETECTION BASED ON GNSS SIGNAL STRENGTH MEASUREMENTS**
*Kegen Yu, Chris Rizos, Andrew G Dempster, University of New South Wales, Australia*

**TU4.109.4** 16:40 **APPLICATION OF HYPERSPECTRAL DATA FOR ASSESSING PEATLAND FOREST CONDITION WITH SPECTRAL AND TEXTURE CLASSIFICATION**
*Taichi Takayama, Takashi Ohki, Hozuma Sekine, Mitsubishi Research Institute, Inc., Japan; Seido Ohnishi, Japan Space Systems, Japan; Satomi Shiodera, Hokkaido University, Japan; Muhammad Evri, Agency for the Assessment and Application of Technology (BPPT), Indonesia; Mitsuru Osaki, Hokkaido University, Japan*

**TU4.109.5** 17:00 **REVERSE CASTING TAIWAN RED CYPRESS DISTRIBUTION IN CENTRAL TAIWAN FROM TOPOGRAPHIC SHELTERING EFFECTS OF TAIWAN FIR IN HOHUAN MOUNTAINS**
*Yi-Hsien Lin, Nan-Chang Lo, Chung-Hsing University, Taiwan; Wei-I Chang, Forest Bureau, Council of Agriculture, Taiwan; Kai-Yi Huang, Department of Forestry, Chung-Hsing University, Taiwan*

Tuesday, July 23 | 08:20 - 10:00 | Room 110
Session TU1.110 | Oral

### Hyperspectral Classification I

Session Co-Chairs: Alina Zare, University of Missouri; Jenny Du, Mississippi State University

**TU1.110.1** 08:20 **A NOVEL ENDMEMBER EXTRACTION METHOD USING MODIFIED MAXIMUM SPECTRAL SCREENING**
*Hongjun Su, Hohai University, China; Peijun Du, Nanjing University, China; Qian Du, Mississippi State University, United States*

**TU1.110.2** 08:40 **SUPERVISED HYPERSPECTRAL IMAGE CLASSIFICATION USING SPARSE LOGISTIC REGRESSION AND SPATIAL-TV REGULARIZATION**
*Le Sun, Zebin Wu, Jianjun Liu, Zhihui Wei, Nanjing University of Science and Technology, China*

**TU1.110.3** 09:00 **HYPERSPECTRAL IMAGE CLASSIFICATION BASED ON ITERATIVE SUPPORT VECTOR MACHINE BY INTEGRATING SPATIAL-SPECTRAL INFORMATION**
*Belkacem Baassou, He Mingyi, Muhammad Imran Farid, Mei Shaohui, Northwestern Polytechnical University, China*

**TU1.110.4** 09:20 **LAPLACIAN SUPPORT VECTOR MACHINE FOR HYPERSPECTRAL IMAGE CLASSIFICATION BY USING MANIFOLD LEARNING ALGORITHMS**
*Xiaopan Wang, Li Ma, Fujiang Liu, China University of Geosciences, China*

**TU1.110.5** 09:40 **A NEW APPROACH FOR ACCURATE CLASSIFICATION OF HYPERSPECTRAL IMAGES USING VIRTUAL SAMPLE GENERATION BY CONCURRENT SELF-ORGANIZING MAPS**
*Victor-Emil Neagoe, Adrian-Dumitru Ciotec, Polytechnic University of Bucharest, Romania*

Tuesday, July 23 | 10:30 - 12:10 | Room 110
Session TU2.110 | Oral

### Hyperspectral Classification II

Session Co-Chairs: Antonio Plaza, University of Extramadura; Lorenzo Bruzzone, University of Trento

**TU2.110.1** 10:30 **CLASSIFICATION-ORIENTED HYPERSPECTRAL AND POLSAR IMAGES SYNERGIC PROCESSING**
*Tong Li, Junping Zhang, Honglei Zhao, Cuiping Shi, Harbin Institute of Technology, China*

**TU2.110.2** 10:50 **DYNAMIC CLASSIFIER SYSTEM FOR HYPERSPECTRAL IMAGE CLASSIFICATION**
*Bharath Bhushan, Rama Rao Nidamanuri, Indian Institute of Space Science and Technology, India*

**TU2.110.3** 11:10 **HYPERSPECTRAL IMAGE CLASSIFICATION BASED ON DIRICHLET PROCESS MIXTURE MODELS**
*Hao Wu, Saurabh Prasad, Minshan Cui, Nam Nguyen, Zhu Han, University of Houston, United States*

**TU2.110.4** 11:30 **LEARNING A JOINT MANIFOLD WITH GLOBAL-LOCAL PRESERVATION FOR MULTITEMPORAL HYPERSPECTRAL IMAGE CLASSIFICATION**
*Hsiuhan Lexie Yang, Melba M. Crawford, Purdue University, United States*

**TU2.110.5** 11:50 **MULTISCALE SPECTRAL-SPATIAL CLASSIFICATION FOR HYPERSPECTRAL IMAGERY**
*Zhiling Long, Qian Du, Nicolas H. Younan, Mississippi State University, United States*

Tuesday, July 23 | 13:30 - 15:10 | Room 110
Session TU3.110 | Oral

### Hyperspectral Target/Anomaly Detection

Session Co-Chairs: Michal Shimoni, Signal and Image Centre of Royal Military Academy, Belgium; Peijun Du, Nanjing University

**TU3.110.1** 13:30 **UNSUPERVISED NEAREST REGULARIZED SUBSPACE FOR ANOMALY DETECTION IN HYPERSPECTRAL IMAGERY**
*Wei Li, Beijing University of Chemical Technology, China; Qian Du, Mississippi State University, United States*

**TU3.110.2** 13:50 **HYPERSPECTRAL TARGET DETECTION WITH SPARSENESS CONSTRAINT**
*Ben Ma, Qian Du, Mississippi State University, United States*

**TU3.110.3** 14:10 **SUBPIXEL TARGET DETECTION IN HYPERSPECTRAL IMAGERY USING PIECE-WISE CONVEX SPATIAL-SPECTRAL UNMIXING, POSSIBILISTIC AND FUZZY CLUSTERING, AND CO-REGISTERED LIDAR**
*Taylor Glenn, Dmitri Dranishnikov, Paul Gader, University of Florida, United States; Alina Zare, University of Missouri, United States*

**TU3.110.4** 14:30 **PERFORMANCE ANALYSIS OF ROBUST DETECTORS FOR HYPERSPECTRAL IMAGING**
*Joana Frontera-Pons, Supélec, France; Jean-Philippe Ovarlez, ONERA, France; Frédéric Pascal, Supélec, France; Jocelyn Chanussot, GIPSA-LAB, France*

**TU3.110.5** 14:50 **ENDMEMBER EXTRACTION BASED ON MODIFIED ITERATIVE ERROR ANALYSIS**
*Liguo Wang, Fangjie Wei, Danfeng Liu, Ying Wang, Qunming Wang, College of Information and Communications Engineering, Harbin Engineering University, China*

Tuesday, July 23 | 15:40 - 17:20 | Room 110
Session TU4.110 | Oral

### Hyperspectral Noise Reduction

Session Chair: Yongqiang Zhao, Northwestern Polytechnical University

**TU4.110.1** 15:40 **NOISE REDUCTION FOR HYPERSPECTRAL IMAGES BASED ON STRUCTURAL SPARSE AND LOW-RANK MATRIX DECOMPOSITION**
*Qian Li, Zhenbo Lu, Qingbo Lu, Houqiang Li, Weiping Li, University of Science and Technology of China, China*

**TU4.110.2** 16:00 **MT-OMP FOR HYPERSPECTRAL IMAGERY DENOISING WITH MODEL PARAMETER ESTIMATION**
*Minchao Ye, Yuntao Qian, Qi Wang, Zhejiang University, China*

**TU4.110.3** 16:20 **NOISE REDUCTION OF HYPERSPECTRAL IMAGERY BASED ON NONLOCAL TENSOR FACTORIZATION**
*Danping Liao, Zhejiang University, China; Minchao Ye, College of computer science, Zhejiang University, China; Sen Jia, College of Computer Science and Software Engineering, Shenzhen University, China; Yuntao Qian, Zhejiang University, China*

**TU4.110.4** 16:40 **INTEGRATING ANOMALY DETECTION TO SPATIAL PREPROCESSING FOR ENDMEMBER EXTRACTION OF HYPERSPECTRAL IMAGES**
*Alp Ertürk, Davut Çesmeci, Deniz Gerçek, Mehmet Kemal Güllü, Sarp Ertürk, Kocaeli University Laboratory of Image and Signal Processing (KULIS), Turkey*

**TU4.110.5** 17:00 **HYPERSPECTRAL IMAGE DENOISING VIA SPARSITY AND LOW RANK**
*Yongqiang Zhao, Jinxiang Yang, Northwestern Polytechnical University, China*

Tuesday, July 23 | 08:20 - 10:00 | Room 111
Session TU1.111 | Oral

### Student Paper Contest I

Session Co-Chairs: Martti Hallikainen, Aalto University; Dara Entekhabi, Massachusetts Institute of Technology

**TU1.111.1** 08:20 **A RADAR-RADIOMETER SURFACE SOIL MOISTURE RETRIEVAL ALGORITHM FOR SMAP**
*Ruzbeh Akbar, Mahta Moghaddam, University of Southern California, United States*

**TU1.111.2** 08:40 **AUTOMATIC CO-REGISTRATION OF SATELLITE IMAGERY AND LIDAR DATA USING LOCAL MUTUAL INFORMATION**
*Ebadat Ghanbari Parmehr, Clive Fraser, Chunsun Zhang, Cooperative Research Centre for Spatial Information, Australia; Joseph Leach, University of Melbourne, Australia*

**TU1.111.3** 09:00 **GEODETIC QUALITY ASSESSMENT OF A LOW-COST INSAR TRANSPONDER**
*Pooja Mahapatra, Sami Samiei-Esfahany, Ramon Hanssen, Hans van der Marel, TU Delft, Netherlands*

**TU1.111.4** 09:20 **THE SPECTRAL-SPATIAL CLASSIFICATION OF HYPERSPECTRAL IMAGES BASED ON HIDDEN MARKOV RANDOM FIELD AND ITS EXPECTATION-MAXIMIZATION**
*Pedram Ghamisi, Jon Atli Benediktsson, Magnus O. Ulfarsson, University of Iceland, Iceland*

**TU1.111.5** 09:40 **SHORT-RANGE FMCW X-BAND RADAR PLATFORM FOR MILLIMETRIC DISPLACEMENTS MEASUREMENT**
*Andrei Anghel, University Politehnica of Bucharest / GIPSA-lab, Romania; Gabriel Vasile, CNRS / GIPSA-lab, France; Remus Cacoveanu, University Politehnica of Bucharest, Romania; Cornel Ioana, CNRS / GIPSA-lab, France; Silviu Ciochina, University Politehnica of Bucharest, Romania*

Tuesday, July 23 | 10:30 - 12:10 | Room 111
Session TU2.111 | Oral

### Student Paper Contest II

Session Co-Chairs: Martti Hallikainen, Aalto University; David LeVine, NASA Goddard Space Flight Center

**TU2.111.1** 10:30 **MULTISPECTRAL LAND-USE/LAND-COVER MODEL PORTABILITY IN MULTI-TEMPORAL MULTI-ANGLE VERY HIGH RESOLUTION IMAGERY**
*Nathan Longbotham, William (Bill) Emery, University of Colorado, United States; Fabio Pacifici, DigitalGlobe Inc., United States*

**TU2.111.2** 10:50 **ESTIMATING THE GROUND HEIGHT WITH L-BAND IFSAR IN A WIND-BLOWN FOREST ENVIRONMENT**
*Michael Benson, Leland Pierce, Kamal Sarabandi, University of Michigan, United States*

**TU2.111.3** 11:10 **SEMANTIC SUBSPACE LEARNING FOR MENTAL SEARCH IN SATELLITE IMAGES**
*Phong D. Vo, Hichem Sahbi, Telecom ParisTech, France*

**TU2.111.4** 11:30 **FIRST DEMONSTRATION OF 3-D HOLOGRAPHIC TOMOGRAPHY WITH FULLY POLARIMETRIC MULTI-CIRCULAR SAR AT L-BAND**
*Octavio Ponce, Pau Prats-Iraola, Rolf Scheiber, Andreas Reigber, Alberto Moreira, German Aerospace Center (DLR), Germany*

**TU2.111.5** 11:50 **SAR SIMULATION FOR LARGE SCENES BY RAY TRACING TECHNIQUE BASED ON GPU**
*Tingting Liu, Kaizhi Wang, Xingzhao Liu, Shanghai Jiao Tong University, China*

Tuesday, July 23 | 13:30 - 15:10 | Room 111
Session TU3.111 | Oral-Invited

### Global Precipitation Measurement II

Session Chair: Toshio Iguchi, National Institute of Information and Communications Technology (NICT)

**TU3.111.1** 13:30 **GPM MISSION OVERVIEW AND U.S. SCIENCE STATUS**
*Arthur Hou, Gail Skofronick-Jackson, NASA Goddard Space Flight Center, United States*

**TU3.111.2** 13:50 **RAIN RETREAVAL ALGORITHM FOR THE DUAL-FREQUENCY PRECIPITATION RADAR ON THE GPM CORE SATELLITE**
*Toshio Iguchi, National Institute of Information and Communications Technology, Japan; Shinta Seto, Nagasaki University, Japan; Jun Awaka, Tokai University, Japan; Robert Meneghini, NASA, United States; Takuji Kubota, Japan Aerospace Exploration Agency, Japan; V. Chandrasekar, Colorado State University, United States; Naofumi Yoshida, Remote Sensing Technology Center of Japan, Japan; Hiroshi Hanado, National Institute of Information and Communications Technology, Japan*

**TU3.111.3** 14:10 **HYDROMETEOR PHASE IDENTIFICATION USING AIRBORNE DUAL-WAVELENGTH DOPPLER RADAR**
*Liang Liao, Morgan State University, United States; Robert Meneghini, NASA, United States*

**TU3.111.4** 14:30 **HYDROMETEOR PROFILE CHARACTERIZATION AND DROP SIZE DISTRIBUTION RETRIEVAL ALGORITHMS FOR GLOBAL PRECIPITATION MEASUREMENT MISSION**
*Minda Le, V. Chandrasekar, Colorado State University, United States*

**TU3.111.5** 14:50 **FALLING SNOW DETECTION THRESHOLDS AND RATE RETRIEVALS FOR THE GLOBAL PRECIPITATION MEASUREMENT (GPM) MISSION**
*Gail Skofronick-Jackson, NASA Goddard Space Flight Center, United States; Stephen Joe Munchak, University of Maryland, ESSIC, United States; Benjamin Johnson, University of Maryland, JCET, United States*

Tuesday, July 23 | 15:40 - 17:20 | Room 111
Session TU4.111 | Oral-Invited

### Global Precipitation Measurement III

Session Co-Chairs: Gail Skofronick-Jackson, NASA Goddard Space Flight Center; Kinji Furukawa, Japan Aerospace Exploration Agency (JAXA)

**TU4.111.1** 15:40 **THE GLOBAL PRECIPITATION MEASUREMENT (GPM) PROJECT; CORE OBSERVATORY LAUNCH FEVER**
*Ardeshir Art Azarbarzin, Candace Carlisle, NASA, United States*

**TU4.111.2** 16:00 **GPM MICROWAVE IMAGER KEY TECHNOLOGIES, PERFORMANCE AND CALIBRATION RESULTS**
*David Newell, Don Figgins, David Draper, Barry Berdanier, Michael Kubitschek, Adam Sexton, Ball Aerospace and Technologies Corporation, United States; Sergey Krimchansky, NASA Goddard Space Flight Center, United States*

**TU4.111.3** 16:20 **SATELLITE SYSTEM TEST STATUS OF THE DUAL-FREQUENCY PRECIPITATION RADAR ON THE GLOBAL PRECIPITATION MEASUREMENT CORE SPACECRAFT**
*Kinji Furukawa, Masahiro Kojima, Takeshi Miura, Yasutoshi Hyakusoku, Hiroki Kai, Takayuki Ishikiri, Japan Aerospace Exploration Agency, Japan; Toshio Iguchi, Hiroshi Hanado, Katsuhiro Nakagawa, National Institute of Information and Communications Technology, Japan; Minoru Okumura, NEC TOSHIBA Space systems, Japan*

**TU4.111.4** 16:40 **EFFECT OF MICROWAVE RADIOMETER INTER-CALIBRATION ON RAINFALL ACCUMULATION FOR THE GLOBAL PRECIPITATION MEASUREMENT MISSION**
*Rachael Kroodsma, Darren McKague, Christopher S. Ruf, University of Michigan, United States*

**TU4.111.5** 17:00 **RADIOMETRIC INTERCALIBRATION OF THE MICROWAVE HUMIDITY SOUNDER ON NOAA-18, METOP-A , AND NOAA-19 USING SAPHIR ON MEGHA-TROPIQUES**
*W Linwood Jones, University of Central Florida, United States; Saswati Datta, Data and Image Processing Consultants, United States; Andrea Santos-Garcia, Central Florida Remote Sensing Lab, United States; James Wang, Science Systems and Applications, Inc, United States; Vivienne Payne, Jet Propulsion Laboratory, United States; Nicholas Viltard, Laboratorie Atmospheres Milieux, Observations Spatiales, France; Thomas Wilheit, Texas A&M University, United States*

Tuesday, July 23 | 08:20 - 10:00 | Room 112
Session TU1.112 | Oral

### Use Cases and the Development of Digital Earth

Session Chair: Michael Goodchild, University of California, Santa Barbara

**TU1.112.2** 08:40 **RESEARCH ON GLOBE DISTANCE SURVEY BASED ON GLOBE SUBDIVISION**
*Huiling Wang, Guoliang Pu, Chengqi Cheng, Peking University, China; Shifeng Wang, Naval Medical Research Institute, China*

**TU1.112.3** 09:00 **VISUAL ANALYTICS TOOLBOX FOR DATA-INTENSIVE ANALYSIS**
*Kwo-Sen Kuo, NASA Goddard Space Flight Center/Caelum Research Corp., United States; Manil Maskey, Rahul Ramachandran, University of Alabama-Huntsville, United States*

**TU1.112.4** 09:20 **PARETO OPTIMIZATION FOR MULTIOBJECTIVE MATCHING OF GEOSPATIAL ONTOLOGIES**
*Ujwala Bharambe, Surya Durbha, Kuldeep Kurte, Indian Institute of Technology Bombay, India; Nicolas H. Younan, Roger King, Mississippi State University, United States*

**TU1.112.5** 09:40 **PROGRESS AND MISSED OPPORTUNITIES IN SPATIAL ANALYSIS FOR DIGITAL EARTH**
*Nicholas Chrisman, RMIT University, Australia*

Tuesday, July 23 | 10:30 - 12:10 | Room 112
Session TU2.112 | Oral

### Snow Remote Sensing I

Session Chair: Leung Tsang, University of Washington

**TU2.112.1** 10:30 **ESTIMATING SNOW WATER EQUIVALENT FOR A SNOW-COVERED PRAIRIE GRASS FIELD BY GPS INTERFEROMETRIC REFLECTOMETRY**
*Mark Jacobson, Montana State University Billings, United States*

**TU2.112.2** 10:50 **INTER-COMPARISONS OF SNOW COVERED TERRIAN MICROWAVE SCATTERING MODELS**
*Chuan Xiong, Jiancheng Shi, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

**TU2.112.3** 11:10 **UNCONSTRAINED NONLINEAR OPTIMIZATION OF A DISTRIBUTED SWE MODEL USING MODIS AND IN SITU MEASUREMENTS OVER THE FRENCH ALPS**
*Gabriel Vasile, CNRS, France; Adrian Tudoroiu, Grenoble Institute of Technology, France; Frédéric Gottardi, Joël Gailhard, Alexandre Girard, Guy d'Urso, Électricité de France (EDF), France*

**TU2.112.4** 11:30 **EVOLUTION OF THE GLOBSNOW SNOW WATER EQUIVALENT RETRIEVAL METHODOLOGY FOR CLIMATE RESEARCH PURPOSES**
*Kari Luojus, Jouni Pulliainen, Matias Takala, Juha Lemmetyinen, Tuomo Smolander, Jaakko Ikonen, Juval Cohen, Finnish Meteorological Institute, Finland; Chris Derksen, Environment Canada, Canada; Simon Pinnock, European Space Agency, Italy*

**TU2.112.5** 11:50 **WET SNOW BACKSCATTERING SENSITIVITY ON DENSITY CHANGE FOR SWE ESTIMATION**
*Nikola Besic, Gabriel Vasile, Jocelyn Chanussot, GIPSA-lab, France; Srdjan Stankovic, University of Montenegro, Yugoslavia; Didier Boldo, Guy d'Urso, Électricité de France (EDF), France*

Tuesday, July 23 | 13:30 - 15:10 | Room 112
Session TU3.112 | Oral

### Snow Remote Sensing II

Session Co-Chairs: Martti Hallikainen, Aalto University; Edward Kim, NASA Goddard Space Flight Center

**TU3.112.1** 13:30 **SEASONAL MEASUREMENTS OF SNOW PHYSICAL AND RADIOMETRIC PROPERTIES DURING RAIN-ON-SNOW EVENTS (ROS) OVER EASTERN CANADA**
*Alexandre Langlois, Alain Royer, Benoit Montpetit, Universite de Sherbrooke, Canada*

**TU3.112.2** 13:50 **MONITORING SNOW COVER CHANGES AND THEIR RELATIONSHIPS WITH TEMPERATURE OVER THE TIBETAN PLATEAU USING MODIS DATA**
*Zhiguang Tang, Jian Wang, Hongyi Li, Lili Yan, Ji Liang, Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences, China*

**TU3.112.3** 14:10 **EVALUATION AND COMPARISON OF FY-2E VISSR, MODIS AND IMS SNOW COVER OVER THE TIBETAN PLATEAU**
*Juntao Yang, Lingmei Jiang, Beijing Normal University, China; Jiancheng Shi, Chinese Academy of Sciences, China; Fengmin Wu, Shu Wang, Xiaokang Kou, Beijing Normal University, China*

**TU3.112.4** 14:30 **IMPROVING SNOW EXTENT AND WETNESS DETECTION IN GLOBSNOW SNOW WATER EQUIVALENT PRODUCT**
*Matias Takala, Jouni Pulliainen, Kari Luojus, Juha Lemmetyinen, Finnish Meteorological Institute, Finland*

**TU3.112.5** 14:50 **AN APPLICATION OF ANN FOR MOUNTAINOUS SNOW COVER FRACTION MAPPING WITH MODIS AND ANCILLARY TOPOGRAPHIC DATA**
*Jinliang Hou, Chunlin Huang, Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences, China*

Tuesday, July 23 | 15:40 - 17:20 | Room 112
Session TU4.112 | Oral

### Future Missions and Systems

Session Co-Chairs: Medhavy Thankappan, Geoscience Australia; Takeo Tadono, Japan Aerospace Exploration Agency (JAXA)

**TU4.112.1** 15:40 **SMOS-NEXT: A NEW INSTRUMENT FOR HIGH RESOLUTION SOIL MOISTURE AND OCEAN SALINITY MONITORING**
*François Cabot, Yan Soldo, Bernard Rouge, Centre d'Études Spatiales de la BIOsphère, France; Eric Anterrieu, IRAP, France; Guy Lesthievent, CNES, France; Yann H. Kerr, Centre d'Études Spatiales de la BIOsphère, France*

**TU4.112.2** 16:00 **REGIONAL SURFACE WATER ACCOUNTING AND THE FUTURE SWOT SATELLITE MISSION**
*Ben Gouweleeuw, Commonwealth Scientific and Industrial Research Organisation, Australia; Charon Birkett, University of Maryland, United States*

**TU4.112.3** 16:20 **GLOBAL HIGH RESOLUTION SOIL MOISTURE PRODUCT FROM THE SOIL MOISTURE ACTIVE PASSIVE (SMAP) MISSION**
*Narendra Das, Jet Propulsion Laboratory, United States; Dara Entekhabi, Massachusetts Institute of Technology, United States; Eni Njoku, Jet Propulsion Laboratory, United States*

**TU4.112.4** 16:40 **JOINT POLAR SATELLITE SYSTEM (JPSS) COMMON GROUND SYSTEM (CGS) MULTIMISSION SUPPORT**
*Michael Jamilkowski, Shawn Miller, Kerry Grant, Raytheon Company, United States*

**TU4.112.5** 17:00 **ON THE DEMONSTRATED EXPERIMENT USING LEX AND L1 SIGNAL FROM JAPANESE QUASI-ZENITH SATELLITE MICHIBIKI IN HOKURIKU DISTRICT**
*Soichiro Shiraishi, Masaaki Shikada, Kanazawa Institute of Technology, Japan*

Tuesday, July 23 | 08:20 - 10:00 | Room 207
Session TU1.207 | Oral-Invited

### Active/Passive Microwave Remote Sensing of Terrestrial Snow

Session Co-Chairs: Xiaolan Xu, NASA Jet Propulsion Laboratory; Jiancheng Shi, Institute of Remote Sensing Applications, Chinese Academy of Sciences

**TU1.207.1** 08:20 **APPLICATION OF A THERMODYNAMIC SNOW MODEL TO PREDICT ACTIVE AND PASSIVE MICROWAVE SIGNATURES OF TERRESTRIAL SNOW**
*Jouni Pulliainen, Anna Kontu, Juha Lemmetyinen, Finnish Meteorological Institute, Switzerland; Martin Schneebeli, Martin Proksch, SLF, Switzerland; Andreas Wiesmann, Gamma Remote Sensing, Switzerland; Christian Mätzler, University of Bern, Switzerland; Helmut Rott, Thomas Nagler, ENVEO IT, Austria; Richard Essery, University of Edinburgh, United Kingdom; Dirk Schüttemeyer, Michael Kern, European Space Agency, Netherlands; Matias Takala, Kari Luojus, Finnish Meteorological Institute, Finland*

**TU1.207.2** 08:40 **COMBINED USE OF EXPERIMENTAL DATA AND A MULTI-LAYER MODEL FOR INVESTIGATING THE SENSITIVITY OF MICROWAVE INDEXES TO SNOW PARAMETERS**
*Emanuele Santi, Marco Brogioni, Simonetta Paloscia, Simone Pettinato, Enrico Palchetti, IFAC-CNR, Italy; Chuan Xiong, Chinese Academy of Sciences, China; Andrea Crepaz, ARPAV, Italy*

**TU1.207.3** 09:00 **MULTILAYER BICONTINUOUS DMRT MODEL WITH ROUGH SURFACE BOUNDARY CONDITIONS FOR RADAR SCATTERING FROM TERRESTRIAL SNOW**
*Xiaolan Xu, Jet Propulsion Laboratory, United States; Shurun Tan, Leung Tsang, University of Washington, United States; Simon Yueh, Jet Propulsion Laboratory, United States; Juha Lemmetyinen, Finnish Meteorological Institute, Finland*

**TU1.207.4** 09:20 **THE EFFECTS OF MULTILAYERING STRUCTURE OF SNOW ON BACKSCATTERING FROM SNOW COVERED SOILS**
*Marco Brogioni, IFAC-CNR, Italy; Chuan Xiong, Chinese Academy of Sciences, China; Andrea Crepaz, ARPAV, Italy; Simonetta Paloscia, Paolo Pampaloni, Emanuele Santi, IFAC-CNR, Italy; Jianchen Shi, Chinese Academy of Sciences, China*

**TU1.207.5** 09:40 **MICROWAVE RADIOMETER STUDIES OF SNOW ON LAKE ICE**
*Martti Hallikainen, Matti Vaaja, Annakaisa von Lerber, Kalle Nordling, Aalto University, Finland; Juha Lemmetyinen, Finnish Meteorological Institute, Finland; Juha Kainulainen, Jaakko Seppänen, Aalto University, Finland*

Tuesday, July 23 | 10:30 - 12:10 | Room 207
Session TU2.207 | Oral-Invited

### Temporal Decorrelation and Repeat-Pass Interferometry Over Forests

Session Chair: Marco Lavalle, NASA Jet Propulsion Laboratory

**TU2.207.1** 10:30 **ADAPTING POLSARPROSIM TO SIMULATE TEMPORAL DECORRELATION IN A HETEROGENEOUS MIXED FOREST**
*Razi Ahmed, Scott Hensley, Maxim Neumann, Marco Lavalle, Jet Propulsion Laboratory, United States; Paul Siqueira, University of Massachusetts, United States*

**TU2.207.2** 10:50 **EXTRACTING TREE HEIGHT FROM REPEAT-PASS POLINSAR DATA: EXPERIMENTS WITH JPL AND ESA AIRBORNE SYSTEMS**
*Marco Lavalle, Razi Ahmed, Maxim Neumann, Scott Hensley, Jet Propulsion Laboratory / California Institute of Technology, United States*

**TU2.207.3** 11:10 **SENSITIVITY ANALYSIS OF THE DEFORESTATION AREA USING TIMESERIES AMPLITUDE AND INTERFEROMETRIC COHERENCE**
*Masanobu Shimada, Takeshi Motooka, Manabu Watanabe, Japan Aerospace Exploration Agency, Japan*

**TU2.207.4** 11:30 **FOREST TEMPORAL DECORRELATION: 3D ANALYSES AND PROCESSING IN THE DIFF-TOMO FRAMEWORK**
*Fabrizio Lombardini, Federico Viviani, University of Pisa / CNIT-RaSS, Italy; Francesco Cai, Francesco Dini, University of Pisa, Italy*

**TU2.207.5** 11:50 **TEMPORAL DECORRELATION IN TROPICAL FOREST: RESULTS FROM TROPISCAT AND IMPLICATIONS FOR BIOMASS TOMOGRAPHY**
*Dinh Ho Tong Minh, Centre d'Études Spatiales de la BIOsphère, France; Stefano Tebaldini, Fabio Rocca, Politecnico di Milano, Italy; Thuy Le Toan, Centre d'Études Spatiales de la BIOsphère, France; Pierre Borderies, ONERA, France; Thierry Koleck, Centre d'Études Spatiales de la BIOsphère, France; Clément Albinet, Office National d'Etudes et de Recherches Aérospatiales (ONERA), France; Ludovic Villard, Alia Hamadi, Centre d'Études Spatiales de la BIOsphère, France*

Tuesday, July 23 | 13:30 - 15:10 | Room 207
Session TU3.207 | Oral-Invited

### Data Fusion I

**TU3.207.1** 13:30 **COMBINING STRONG FEATURES FOR REGISTRATION OF HYPERSPECTRAL AND LIDAR DATA FROM FIELD-BASED PLATFORMS**
*Sildomar Monteiro, Juan Nieto, Richard Murphy, Rishi Ramakrishnan, Zachary Taylor, University of Sydney, Australia*

**TU3.207.2** 13:50 **KERNEL STRUCTURAL SIMILARITY ON HYPERSPECTRAL IMAGES**
*Vicent Talens, Valero Laparra, Jesús Malo, Gustavo Camps-Valls, Universitat de València, Spain*

**TU3.207.3** 14:10 **MULTIPLE KERNEL ACTIVE LEARNING FOR ROBUST GEO-SPATIAL IMAGE ANALYSIS**
*Hsiuhan Lexie Yang, Purdue University, United States; Yuhang Zhang, Saurabh Prasad, University of Houston, United States; Melba M. Crawford, Purdue University, United States*

**TU3.207.4** 14:30 **FUSION OF SPECTRAL AND SPATIAL FEATURES FOR HUMAN SETTLEMENT EXTRACTION**
*Gianni Cristian Iannelli, Paolo Gamba, Fabio Dell'Acqua, University of Pavia, Italy; Gianni Lisini, IUSS, Italy; Gilson A.O.P. Costa, Raul Queiroz Feitoza, PUC Rio, Brazil*

**TU3.207.5** 14:50 **PANSHARPENING OF REMOTE SENSING IMAGES WITH A MATTING MODEL**
*Xudong Kang, University of Iceland, Iceland; Shutao Li, Hunan University, China; Jon Atli Benediktsson, University of Iceland, Iceland*

Tuesday, July 23 | 15:40 - 17:20 | Room 207
Session TU4.207 | Oral-Invited

### Data Fusion II

**TU4.207.1** 15:40 **MONITORING HUMAN ACTIVITY WITH HIGH RESOLUTION SAR AND OPTICAL IMAGERY – A SYNERGISTIC APPROACH**
*Oliver Lang, Diana Weihing, Astrium GEO-Information Services, Germany; Derrold Holcomb, Intergraph Corporation, United States; Dane Williams, Brian Schmid, Formation Environmental, LLC, United States; Marek Tinz, Astrium GEO-Information Services, Germany*

**TU4.207.2** 16:00 **MULTIRESOLUTION SAR DATA FUSION FOR UNSUPERVISED CHANGE DETECTION**
*Gabriele Moser, Sebastiano Serpico, Gianni Vernazza, University of Genoa, Italy*

**TU4.207.3** 16:20 **OBJECT-BASED CHANGE DETECTION FOR INDIVIDUAL BUILDINGS IN SAR IMAGES CAPTURED WITH DIFFERENT INCIDENCE ANGLES**
*Junyi Tao, German Aerospace Center (DLR), Germany; Stefan Auer, Technische Universität München (TUM), Germany; Peter Reinartz, Richard Bamler, German Aerospace Center (DLR), Germany*

**TU4.207.4** 16:40 **A NOVEL SUBBAND FUSION METHOD FOR SAR ECHO COMBINED WITH COMPRESSED SENSING**
*Peng-Bo Wang, Yue-Shan Liu, Chun-Sheng Li, Beihang University, China; Zhong-Ma Cui, Beijing Institute of Remote Sensing Equipment, China; Jie Chen, Shuang Li, Beihang University, China*

**TU4.207.5** 17:00 **MULTISENSOR ALIGNMENT OF IMAGE MANIFOLDS**
*Devis Tuia, Maxime Trolliet, Ecole Polytechnique Fédérale de Lausanne, Switzerland; Michele Volpi, University of Lausanne, Switzerland*

**Data Fusion TC Meeting to follow at 17:30.**

Tuesday, July 23 | 08:20 - 10:00 | Room 208
Session TU1.208 | Oral

## Satellite Sensing of Oceans Winds

Session Chair: Mark Bourassa, Florida State University

**TU1.208.1** 08:20 **VALIDATION OF NOAA SCATTEROMETER OCEAN SURFACE WIND VECTOR RETRIEVALS FROM THE OCEANSAT-2 MISSION**
*Seubson Soisuvarn, Zorana Jelenak, National Oceanic and Atmospheric Administration / UCAR, United States; Suleiman Alsweiss, Paul Chang, National Oceanic and Atmospheric Administration, United States*

**TU1.208.2** 08:40 **VALIDATION OF SEA SURFACE WIND VECTER RETRIEVAL FROM CHINA'S HY-2A SCATTEROMETER**
*Xiaofeng Yang, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China; Xiaofeng Li, National Oceanic and Atmospheric Administration / NESDIS, United States; Yang Yu, Ziwei Li, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China*

**TU1.208.3** 09:00 **INTERCOMPARISON OF FOUR OCEAN VECTOR WIND PRODUCTS FROM OCEANSAT-2 SCATTEROMETER**
*Naoto Ebuchi, Hokkaido University, Japan*

**TU1.208.4** 09:20 **COINCIDENT, HIGH RESOLUTION MEASUREMENTS OF OCEAN SURFACE RAIN IN SUPPORT OF IMPROVED ASCAT-RETRIEVED WINDS**
*David Weissman, Teresa Johnson, Justin Wolf, Hofstra University, United States; Marcos Portabella, Wenming Lin, Institut de Ciències del Mar CSIC, Spain; Ad Stoffelen, Anton Verhoef, Royal Netherlands Meteorological Institute, Netherlands*

**TU1.208.5** 09:40 **QUANTITATIVE ANALYSIS OF BORA EVENTS IN THE ADRIATIC SEA BY MEANS OF SAR-BASED TECHNIQUES AND THE ETA MODEL**
*Maria Adamo, Giacomo De Carolis, National Research Council of Italy, Italy; Sandra Morelli, University of Modena and Reggio Emilia, Italy; Guido Pasquariello, Fabio Michele Rana, National Research Council of Italy, Italy*

Tuesday, July 23 | 10:30 - 12:10 | Room 208
Session TU2.208 | Oral

## Ocean Winds: Hurricane Studies and Climate Applications

**TU2.208.1** 10:30 **OPERATIONAL IMPLEMENTATION OF A REAL-TIME SAR WIND SPEED SYSTEM AT NOAA AND APPLICATION TO REPROCESSING FOR WIND CLIMATOLOGY**
*Frank Monaldo, The Johns Hopkins University, United States; William Pichel, Xiaofeng Li, Christopher Jackson, National Oceanic and Atmospheric Administration, United States*

**TU2.208.2** 10:50 **DECADAL TRENDS OF HURRICANE-FORCE EXTRATROPICAL CYCLONES AND THE RESULTING IMPACT ON OCEANIC AND ATMOSPHERIC FORCING**
*Zorana Jelenak, National Oceanic and Atmospheric Administration / NESDIS / STAR-UCAR, United States; Joseph Sienkiewicz, National Oceanic and Atmospheric Administration / NCEP / OPC, United States; Paul Chang, National Oceanic and Atmospheric Administration / NESDIS / STAR, United States*

**TU2.208.3** 11:10 **TROPICAL CYCLONE WIND FIELDS RETRIEVED FROM SAR AT CO- AND CROSS POLARIZATION**
*Jochen Horstmann, Center for Maritime Research and Experimant, Italy; Silvia Falchetti, Center for Maritime Research and Experimentation, Italy; Christopher Wackerman, General Dynamics Advanced Information Systems, United States; Michael Caruso, Hans C. Graber, Center for Southeastern Tropical Advanced Remote Sensing, United States*

**TU2.208.4** 11:30 **TEST OF AN ADVANCED ALGORITHM TO RETRIEVE COMPLEX WIND FIELDS OVER THE BLACK SEA FROM ENVISAT SAR IMAGES**
*Werner Alpers, University of Hamburg, Germany; Alexis Mouche, CLS, France; Jochen Horstmann, Nato Undersea Research Center, Italy; Andrei Ivanov, P.P.Shirshov Institute of Oceanology ,Russian Academy of Science, Russian Federation; Vladyslav Barabanov, Marine Hydrophysical Institute, Ukraine*

**TU2.208.5** 11:50 **PLATFORM AND ACROSS SWATH COMPARISON OF VORITICY SPECTRA FROM QUIKSCAT, ASCAT, AND OSCAT SCATTEROMETERS**
*Heather Holbach, Mark Bourassa, Florida State University, United States*

Tuesday, July 23 | 13:30 - 15:10 | Room 208
Session TU3.208 | Oral

## Ocean Currents and Waves Dynamics

Session Chair: David Weissman, Hofstra University

**TU3.208.1** 13:30 **SPATIO-TEMPORAL EVOLUTION OF WAVE GROUPS DERIVED FROM X-BAND SEA CLUTTER IMAGE TIME SERIES AT GRAZING INCIDENCE**
*Jose Carlos Nieto Borge, University of Alcala, Spain; Konstanze Reichert, OceanWaveS Pacific Ltd., New Zealand; Katrin Hessner, OceanWaveS GmbH, Germany*

**TU3.208.2** 13:50 **HIGH ANGULAR RESOLUTION OCEAN SURFACE CURRENT RADAR BASED ON THE KHATRI-RAO PRODUCT ARRAY PROCESSING**
*Hiroyoshi Yamada, Naoki Ozawa, Yoshio Yamaguchi, Niigata University, Japan; Keizo Hirano, Hiroyuki Ito, Nagano Japan Radio Co. Ltd., Japan*

**TU3.208.3** 14:10 **COMPARISON BETWEEN CURRENT FIELDS DETECTED WITH INFRARED RADIOMETRY AND MODELED CURRENTS AROUND SWEDEN**
*Gisela K. Carvajal, Leif E. B. Eriksson, Lars M. H. Ulander, Anders Berg, Chalmers University of Technology, Sweden*

**TU3.208.4** 14:30 **FEASIBILITY STUDY ON ESTIMATING SEA SURFACE CURRENTS FROM SINGLE (ENVISAT ASAR) AND DUAL (TANDEM-X) SAR SYSTEM**
*Ki-mook Kang, Duk-Jin Kim, Seoul National University, Republic of Korea*

**TU3.208.5** 14:50 **THE DERIVATION OF HIGH FREQUENCY RADAR CROSS SECTIONS FOR SWELL CONTAMINATED SEAS**
*Chengxi Shen, Weimin Huang, Eric Gill, Memorial University of Newfoundland, Canada*

Tuesday, July 23 | 15:40 - 17:20 | Room 208
Session TU4.208 | Oral-Invited

## Remote Sensing Instruments and Technologies for Small Satellites II

Session Co-Chairs: Boon Lim, NASA Jet Propulsion Laboratory; William Blackwell, MIT Lincoln Laboratory

**TU4.208.1** 15:40 **CUBESAT BASED SENSORS FOR GLOBAL WEATHER OBSERVATION**
*Albin Gasiewski, Brian Sanders, David Gallaher, Ron Weaver, Ted Scambos, Lavanya Periasamy, Kyuil Hwang, University of Colorado at Boulder, United States*

**TU4.208.2** 16:00 **NOVASAR-S AND MARITIME SURVEILLANCE**
*Pasquale Iervolino, Raffaella Guida, University of Surrey, United Kingdom; Philip Whittaker, SSTL, United Kingdom*

**TU4.208.3** 16:20 **INTEGRATED SILICON-GERMANIUM ELECTRONICS FOR CUBESAT-BASED RADIOMETERS**
*Christopher Coen, Georgia Institute of Technology, United States; Jeffrey Piepmeier, NASA Goddard Space Flight Center, United States; John Cressler, Georgia Institute of Technology, United States*

**TU4.208.4** 16:40 **CALIBRATION OF A SUPERDARN RADAR ANTENNA BY MEANS OF A SATELLITE BEACON ON A CUBESAT**
*Pierre Cilliers, Doreen Agaba, SANSA Space Science Directorate, South Africa; Michael Inggs, University of Cape Town, South Africa; Robert Van Zyl, CPUT, South Africa*

**TU4.208.5** 17:00 **CURRENT AND FUTURE SMALL SATELLITE PROJECTS IN SOUTH AFRICA**
*Willem Steyn, University of Stellenbosch, South Africa; Robert Van Zyl, Cape Peninsula University of Technology, South Africa; Michael Inggs, University of Cape Town, South Africa; Pierre Cilliers, SANSA Space Science Directorate, South Africa*

Wednesday, July 24 08:20 - 10:00 Room 101

Session WE1.101 Oral-Invited

### Aquarius Mission Calibration/Validation and Science Results I

Session Co-Chairs: David Le Vine, NASA Goddard Space Flight Center; Simon Yueh, NASA Jet Propulsion Laboratory

**WE1.101.1** 08:20 **AQUARIUS KEY SALINITY SCIENCE RESULTS TWO YEARS POST LAUNCH**
*Gary Lagerloef, Earth and Space Research, United States; David Le Vine, NASA Goddard Space Flight Center, United States*

**WE1.101.2** 08:40 **AQUARIUS RADIOMETER ANTENNA TEMPERATURE CALIBRATION**
*Jeffrey Piepmeier, NASA Goddard Space Flight Center, United States; Gary Lagerloef, Earth and Space Research, United States; Shannon T. Brown, Jet Propulsion Laboratory, United States; Liang Hong, David Le Vine, NASA Goddard Space Flight Center, United States*

**WE1.101.3** 09:00 **CHARACTERIZATION AND CORRECTION OF AQUARIUS LONG TERM CALIBRATION DRIFT USING ON-EARTH BRIGHTNESS TEMPERATURE REFERNCES**
*Shannon T. Brown, Sidharth Misra, Jet Propulsion Laboratory, United States; Emmanuel Dinnat, NASA, United States*

**WE1.101.4** 09:20 **AQUARIUS COLD SKY MANEUVERS: ASSESSING CALIBRATION BIAS, TEMPORAL DRIFT, AND ANTENNA BACK LOBES**
*Emmanuel Dinnat, Chapman University / National Air and Space Administration Godddard Space Flight Center, United States; David Le Vine, NASA Goddard Space Flight Center, United States; Saji Abraham, Wyle Information Systems, LLC / NASA Goddard Space Flight Center, United States*

**WE1.101.5** 09:40 **AQUARIUS SALINITY AND WIND RETRIEVAL USING THE CAP ALGORITHM AND APPLICATION TO WATER CYCLE OBSERVATION IN THE INDIAN OCEAN AND SUBCONTINENT**
*Simon Yueh, Wenqing Tang, Alexander Fore, Julian Chaubell, Akiko Hayashi, California Institute of Technology, United States; Gary Lagerloef, Earth and Space Research, United States; Thomas Jackson, Rajat Bindlish, US Department of Agriclture, United States*

Wednesday, July 24 10:30 - 12:10 Room 101

Session WE2.101 Oral-Invited

### Aquarius Mission Calibration/Validation and Science Results II

Session Co-Chairs: Simon Yueh, NASA Jet Propulsion Laboratory; David Le Vine, NASA Goddard Space Flight Center

**WE2.101.1** 10:30 **DEVELOPMENT OF AN AQUARIUS/SAC-D SOIL MOISTURE PRODUCT**
*Rajat Bindlish, Thomas Jackson, USDA ARS, United States; Tianjie Zhao, Chinese Academy of Sciences, China; Michael Cosh, Thomas Holmes, USDA ARS, United States; Peggy O'Neill, NASA, United States*

**WE2.101.2** 10:50 **UPPER OCEAN SALINITY STRATIFICATION: CHALLENGES TO VALIDATE SATELLITE REMOTELY SENSED SEA SURFACE SALINITY**
*Yi Chao, Remote Sensing Solutions, Inc., United States; Hongchun Zhang, University of California, Los Angeles, United States*

**WE2.101.3** 11:10 **SEAWATER PERMITTIVITY MODEL FUNCTION WITH NEW L-BAND SEAWATER MEASUREMENTS AT 33 PSU**
*Yiwen Zhou, Roger Lang, The George Washington University, United States; Cuneyt Utku, David LeVine, NASA Goddard Space Flight Center, United States*

**WE2.101.4** 11:30 **AQUARIUS RFI DETECTION AND MITIGATION**
*David Le Vine, NASA Goddard Space Flight Center, United States; Paolo de Matthaeis, GESTAR, United States; Christopher S. Ruf, David D. Chen, University of Michigan, United States; Emmanuel Dinnat, Chapman University, United States*

**WE2.101.5** 11:50 **THE EFFECT OF LAND CONTAMINATION AND RADIOFREQUENCY INTERFERENCE ON THE AQUARIUS COASTAL SALINITY: THE EAST CHINA SEA**
*Seung-Bum Kim, Jet Propulsion Laboratory, United States; Jae-Hak Lee, Korea Institute of Ocean Science & Technology (KIOST), Republic of Korea; Simon Yueh, Julian Chaubell, Jet Propulsion Laboratory, United States; Gary Lagerloef, Earth and Space Research, United States*

**Internatinal Spaceborne Imaging Spectroscopy TC Meeting to be held in Room 101 at 17:30.**

Wednesday, July 24 08:20 - 10:00 Room 102
Session WE1.102 Oral

## Dynamics of Earth Processes and Climate Change - Biosphere/ Cryospheres

Session Chair: Manabu Watanabe, Japan Aerospace Exploration Agency (JAXA)

**WE1.102.1** 08:20 **LONG-TERM TRENDS IN LAND SURFACE ALBEDO AND LEAF AREA INDEX FROM THE GLOBAL LAND SURFACE SATELLITE (GLASS) PRODUCTS**
*Shunlin Liang, University of Maryland, United States*

**WE1.102.2** 08:40 **MAPPING VEGETATION PRODUCTIVITY DYNAMICS AND DEGRADATION TRENDS OVER EAST AFRICA USING A DECADE OF MEDIUM RESOLUTION MODIS TIME-SERIES DATA**
*Tobias Landmann, International Center of Insect Physiology and Ecology (icipe), Kenya; Olena Dubovyk, University of Bonn, Germany*

**WE1.102.3** 09:00 **EVASPA (EVAPOTRANSPIRATION ASSESSMENT FROM SPACE) TOOL: OVERVIEW AND FIRST ASSESSMENTS**
*Albert Olioso, Belen Gallego-Elvira, Maria Mira, Sergio Reyes-Castillo, INRA, France; Gilles Boulet, IRD, France; Olivier Marloie, Sébastien Garrigues, Dominique Courault, Marie Weiss, INRA, France; Philippe Chauvelon, Olivier Boutron, Fondation Sansouire, Tour du Valat, France*

**WE1.102.4** 09:20 **RAPID SPECTRAL CHANGES IN REFLECTANCE OF ANTARCTIC MOSS**
*Zbynek Malenovský, Stephen Harwin, University of Tasmania, Australia; Sharon A. Robinson, University of Wollongong, Australia; Arko Lucieer, University of Tasmania, Australia*

**WE1.102.5** 09:40 **ESTIMATION OF GLOBAL CARBON EMISSIONS FROM WILD FIRES IN FORESTS AND CROPLANDS**
*Wataru Takeuchi, Ayako Sekiyama, Ryoichi Imasu, The University of Tokyo, Japan*

Wednesday, July 24 10:30 - 12:10 Room 102
Session WE2.102 Oral

## Dynamics of Earth Processes and Climate Change - Hydrosphere

**WE2.102.1** 10:30 **34 YEARS OF REMOTELY SENSED SOIL MOISTURE: WHAT CLIMATE SIGNALS DO WE (NOT) SEE?**
*Wouter Dorigo, Vienna University of Technology, Austria; Clément Albergel, European Centre for Medium Range Weather Forecasts, United Kingdom; Alexander Loew, Tobias Stacke, Max-Planck-Inst. f. Meteorologie, Germany; Alexander Gruber, Wolfgang Wagner, Vienna University of Technology, Austria; Robert Parinussa, Richard de Jeu, VU University Amsterdam, Netherlands; Luca Brocca, National Research Council, Italy; Bernhard Bauer-Marschallinger, Daniel Chung, Christoph Paulik, Vienna University of Technology, Austria*

**WE2.102.2** 10:50 **ESTIMATION OF EVAPORATIVE FRACTION FROM TEMPORAL CHANGES OF TEMPERATURE AND NET RADIATION**
*Jing Lu, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, China; Zhao-Liang Li, Institute of Geographic Sciences and Key Laboratory of Agri-informatics, Ministry of Agriculture/Institute of Agricultural Resources and Regional Planning, Chinese Academy of Agricultural Sciences, China; Ronglin Tang, Bo-Hui Tang, Hua Wu, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, China; Jelila Labed, LSIIT, UdS, France*

**WE2.102.3** 11:10 **ESTIMATION OF TERRESTRIAL WATER STORAGE CHANGE IN THE BHAGIRATHI GANGA AND VISHNU GANGA BASINS USING SATELLITE GRAVIMETRY**
*Mohd Anul Haq, Kamal Jain, Mohd Shoab, Indian Institute of Technology Roorkee, India; K. P. R. Menon, National Remote Sensing Centre, India*

**WE2.102.4** 11:30 **RESEARCH ON STREAM FLOW SERIES FRACTAL DIMENSION ANALYSIS AND ITS RELATIONSHIP WITH SOIL EROSION**
*Mu Lin, Central University of Finance and Economics, China; Lajiao Chen, Yan Ma, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

**WE2.102.5** 11:50 **THE IMPROVEMENT OF ET CALCULATION IN WINTER BY INTRODUCING RADAR-BASED AERODYNAMIC ROUGHNESS INFORMATION INTO ETWATCH SYSTEM**
*Qiang Xing, Bingfang Wu, Weiwei Zhu, Shanlong Lu, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

Wednesday, July 24 13:30 - 15:10 Room 102
Session WE3.102 Oral

## Dynamics of Earth Processes and Climate Change - Atmosphere

Session Co-Chairs: Wei-Kuo Tao, NASA Goddard Space Flight Center; John LeMarshall, Bureau of Meteorology, Australia

**WE3.102.1** 13:30 **ESTIMATING ATMOSPHERIC HUMIDITY USING MODIS CLOUD-FREE DATA IN A TEMPERATE HUMID REGION**
*Hamed Adab, Kasturi Devi Kanniah, Universiti Teknologi Malaysia, Malaysia; Karim Solaimani, Sari University of Agricultural Sciences and Natural Resources, Iran; Kian Pang Tan, Universiti Teknologi Malaysia, Malaysia*

**WE3.102.2** 13:50 **NPP VARIATION AND ITS RESPOND TO PRECIPITATION CHANGE IN POTENTIAL EXTENT OF DESERTIFICATION IN CHINA DURING 2001-2010**
*Zhihai Gao, Bin Sun, Hongyan Wang, Lina Bai, Bengyu Wang, Institute of Forest Resource Information Technique, Chinese Academy of Forestry, China*

**WE3.102.3** 14:10 **SPATIOTEMPORAL CORRELATION ANALYSIS OF SATELLITE-OBSERVED CO2: CASE STUDIES IN CHINA AND USA**
*Lijie Guo, Liping Lei, Zhaocheng Zeng, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

**WE3.102.4** 14:30 **IONOSPHERIC CHARACTERISTICS OF LOW LATITUDE ANOMALY ZONE OVER INDIAN REGION BY GROUND BASED GPS, RADIO OCCULTATION AND SPIM MODEL PREDICTIONS**
*Sampad Kumar Panda, Shirish S. Gedam, Indian Institute of Technology Bombay, India; Girija Rajaram, Indian Institute of Geomagnetism Bombay, India*

Wednesday, July 24 15:40 - 17:20 Room 102
Session WE4.102 Oral-Invited

## Surface Deformation in Volcanic and Seismogenic Areas by means of Advanced Remote Sensing Techniques I

**WE4.102.1** 15:40 **SURFACE DEFORMATION ANALYSIS IN THE MESSINA STRAIT AREA THROUGH DINSAR MEASUREMENTS**
*Marco Chini, INGV, Italy; Michele Manunta, Eugenio Sansosti, CNR, Italy; Enrico Serpelloni, INGV, Italy; Giuseppe Solaro, CNR, Italy; Salvatore Stramondo, Guido Ventura, INGV, Italy*

**WE4.102.2** 16:00 **SUBSIDENCE ESTIMATION OF THE PEATLAND FOREST IN THE CENTRAL KALIMANTAN USING THE PALSAR TIME SERIES DIFFERENTIAL INTERFEROMETRY**
*Masanobu Shimada, Manabu Watanabe, Takeshi Motooka, Japan Aerospace Exploration Agency, Japan*

**WE4.102.3** 16:20 **NEW RESULTS ON POST-SEISMIC DEFORMATIONS OVER L'AQUILA, ITALY, BY HIGH RESOLUTION PSP SAR INTERFEROMETRY**
*Mario Costantini, e-GEOS - an ASI/Telespazio Company, Italy; Christian Bignami, Istituto Nazionale di Geofisica e Vulcanologia, Italy; Salvatore Falco, Fabio Malvarosa, e-GEOS - an ASI/ Telespazio Company, Italy; Marco Moro, Istituto Nazionale di Geofisica e Vulcanologia, Italy; Michele Saroli, University of Cassino and Southern Lazio, Italy; Salvatore Stramondo, Istituto Nazionale di Geofisica e Vulcanologia, Italy*

**WE4.102.4** 16:40 **GPS AIDED ATMOSPHERIC PHASE DELAY MITIGATION IN DIFFERENTIAL SAR INTERFEROMETRY: EXPERIENCES FROM THE 2009 L'AQUILA EARTHQUAKE**
*Nicola d'Agostino, Istituto Nazionale di Geofisica e Vulcanologia, Italy; Gianfranco Fornaro, National Research Council, Italy; Roberta Giuliani, Protezione Civile Nazionale, Italy; Carlo Noviello, Diego Reale, Simona Verde, National Research Council, Italy*

**WE4.102.5** 17:00 **WIDE AREA PERSISTENT SCATTERER INTERFEROMETRY: CURRENT DEVELOPMENTS, ALGORITHMS AND EXAMPLES**
*Nico Adam, Fernando Rodriguez Gonzalez, Alessandro Parizzi, Ramon Brcic, German Aerospace Center (DLR), Germany*

Wednesday, July 24 08:20 - 10:00 Room 103
Session WE1.103 Oral

## Soil Moisture: Satellite Products

Session Co-Chairs: Elena Lobl, University of Alabama in Huntsville; Clara Draper, National Aeronautics and Space Administration

**WE1.103.1** 08:20 **SOIL MOISTURE RETRIEVED FROM MICROWAVE SATELLITE DATA AND ITS RELATIONSHIP WITH THE ASIAN DUST FREQUENCY IN EAST ASIA DURING THE PERIOD FROM 2003 TO 2010**
*Youngmi Kim, Mi-Lim Ou, National Institute of Meteorological Research, Republic of Korea*

**WE1.103.2** 08:40 **TOWARDS A HIGH-DENSITY SOIL MOISTURE NETWORK FOR THE VALIDATION OF SMAP IN PETZENKIRCHEN, AUSTRIA.**
*Mariette Vreugdenhil, Wouter Dorigo, Martine Broer, Peter Haas, Alexander Eder, Patrick Hogan, Guenter Bloeschl, Wolfgang Wagner, Vienna University of Technology, Austria*

**WE1.103.3** 09:00 **SMOS CATDS LEVEL 3 PRODUCTS, SOIL MOISTURE AND BRIGHTNESS TEMPERATURE: PRESENTATION AND RESULTS**
*Lucie Berthon, Arnaud Mialon, Ahmad Al Bitar, François Cabot, Simone Bircher, Centre d'Études Spatiales de la BIOsphère, France; Elsa Jacquette, Centre National d'Études Spatiales, France; Arnaud Quesney, Capgemini, France; Yann H. Kerr, Centre d'Études Spatiales de la BIOsphère, France*

**WE1.103.4** 09:20 **TWO UEARS OF L-BAND RADIOMETRY OVER A MOUTAINOUS REGION: TOPOGRAPHY, SNOW AND FREEZING SOIL ISSUES**
*Thierry Pellarin, Grenoble University, France; Arnaud Mialon, Centre d'Études Spatiales de la BIOsphère, France; Romain Biron, Catherine Coulaud, Bernard Mercier, Samuel Morin, Ghislain Picard, Grenoble University, France; Jean-Pierre Wigneron, INRA Bordeaux, France; Yann H. Kerr, Centre d'Études Spatiales de la BIOsphère, France*

**WE1.103.5** 09:40 **A NEW MODEL OF SURFACE SOIL MOISTURE RETRIEVAL FROM CBERS-02B SATELLITE IMAGERY IN KARST AREA**
*Xiaodong Tao, Guoqing Zhou, Bo Yang, Tao Yue, Wei Zhao, Jingjin Huang, Guilin University of Technology, China*

Wednesday, July 24 13:30 - 15:10 Room 103
Session WE3.103 Oral-Invited

## RADARSAT

Session Chair: Satish Srivastava, Canadian Space Agency

**WE3.103.1** 13:30 **RADARSAT PROGRAM**
*Steve Iris, Satish Srivastava, Daniel De Lisle, Canadian Space Agency, Canada*

**WE3.103.2** 13:50 **RADARSAT-2 OPERATIONAL APPLICATIONS: INFORMATION IN NEAR-REAL TIME**
*Gordon Staples, William Jefferies, Lesley Gamble, MDA, Canada*

**WE3.103.3** 14:10 **RECENT DEVELOPMENT IN SAR-DERIVED WINDS USING POLARIZED RADARSAT-2 DATA**
*Biao Zhang, Nanjing University of Information Science & Technology, China; William Perrie, Bedford Institute of Oceanography, Canada*

**WE3.103.4** 14:30 **MONITORING NORTHERN NATIONAL PARKS IN CANADA: THE RELEVANCE OF RADAR IMAGERY TO PARKS CANADA ECOLOGICAL INTEGRITY MONITORING AND REPORTING**
*Jean Poitevin, Darrel Zell, Parks Canada Agency, Canada; Torsten Geldsetzer, University of Calgary, Canada; Mathieu Benoit, Effigis, Canada*

**WE3.103.5** 14:50 **SHIP DETECTION FOR RADARSAT-2 SCANSAR DATA USING DOG SCALE-SPACE**
*Ziwei Wang, Chao Wang, Fan Wu, Bo Zhang, Hong Zhang, Yixian Tang, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*



Wednesday, July 24 10:30 - 12:10 Room 103
Session WE2.103 Oral

## Soil Moisture: Data Assimilation

Session Co-Chairs: Wade Crow, U.S. Department of Agriculture; Tianjie Zhao, Beijing Normal University

**WE2.103.1** 10:30 **RE-THINKING SENSITIVITY OF MODEL PARAMETER VALUES IN SOIL MOISTURE ASSIMILATION USING THE EVOLUTIONARY DATA ASSIMILATION**
*Gift Dumedah, Jeffrey P. Walker, Monash Unversity, Australia*

**WE2.103.2** 10:50 **COMPARISON OF BIAS CORRECTION METHODS TO IMPROVE SOIL MOISTURE ESTIMATES WHEN ASSIMILATING MICROWAVE ACTIVE/PASSIVE OBSERVATIONS**
*Alejandro Monsivais-Huertero, National Polytechnic Institute, Mexico; Jasmeet Judge, Pang-Wei Liu, University of Florida, United States*

**WE2.103.3** 11:10 **ESTIMATING ROOT MEAN SQUARE ERRORS IN REMOTELY SENSED SOIL MOISTURE OBSERVATIONS OVER CONTINENTAL SCALE DOMAINS**
*Clara Draper, GMAO, NASA Goddard Space Flight Center, United States; Rolf Reichle, GMAO, NASA GSFC, United States; Richard de Jeu, Free University of Amsterdam, Netherlands; Vahid Naeimi, German Aerospace Center (DLR) German Remote Sensing Data Center (DFD), Germany; Robert Parinussa, Free University of Amsterdam, United States; Wolfgang Wagner, Technical University of Vienna, Austria*

**WE2.103.4** 11:30 **EFFECTS OF FORCING UNCERTAINTIES IN THE IMPROVEMENT SKILS OF ASSIMILATING SATELLITE SOIL MOISTURE RETRIEVALS INTO FLOOD FORECASTING MODELS**
*Camila Alvarez, Dongryeol Ryu, Andrew Western, The University of Melbourne, Australia; David Robertson, CSIRO Land and Water, Australia; Wade Crow, USDA, United States; Chris Leahy, Bureau of Meteorology, Australia*

**WE2.103.5** 11:50 **RETRIEVING LAND SURFACE SOIL PARAMETERS BY USING PASSIVE MICROWAVE REMOTE SENSING OBSERVATIONS AND LAND SURFACE MODELS**
*Hui Lu, Tsinghua University, China; Kun Yang, Institute of Tibetan Plateau Research, CAS, China; Toshio Koike, The University of Tokyo, Japan*

Wednesday, July 24 15:40 - 17:20 Room 103
Session WE4.103 Oral-Invited

## TanDEM-X: Mission Status and Science Activities

Session Co-Chairs: Irena Hajnsek, Swiss Federal Institute of Technology, Zurich(ETH) / German Aerospace Center (DLR); Alberto Moreira, German Aerospace Center (DLR)

**WE4.103.1** 15:40 **TANDEM-X MISSION: OVERVIEW, CHALLENGES AND STATUS**
*Manfred Zink, Alberto Moreira, German Aerospace Center (DLR), Germany*

**WE4.103.2** 16:00 **TANDEM-X: SCIENCE ACTIVITIES**
*Irena Hajnsek, German Aerospace Center (DLR) / ETH Zürich, Germany; Thomas Busche, German Aerospace Center (DLR), Germany*

**WE4.103.3** 16:20 **FOREST HEIGHT ESTIMATION AND VALIDATION USING TANDEM-X POLINSAR**
*Shane Cloude, AEL Consultants, United Kingdom; Hao Chen, Natural Resources Canada, Canada; David Goodenough, University of Victoria, Canada*

**WE4.103.4** 16:40 **SURFACE ELEVATION CHANGES OF GLACIERS DERIVED FROM SRTM AND TANDEM-X DEM DIFFERENCES**
*Wael Abdel Jaber, Dana Floricioiu, German Aerospace Center (DLR), Germany; Helmut Rott, University of Innsbruck, Austria; Michael Eineder, German Aerospace Center (DLR), Germany*

**WE4.103.5** 17:00 **CHARACTERIZING THE OCTOBER 2010 LAVA FLOW OF PITON DE LA FOURNAISE USING X-BAND INSAR DATA**
*M. G. Bato, J. L. Froger, A. J. L. Harris, Clermont Université, Université Blaise Pascal, France; N. Villeneuve, UMR7154 CNRS, Laboratoire GéoSciences Réunion, Université de La Réunion, France; T. Souriot, Clermont Université, Université Blaise Pascal, France*

Wednesday, July 24 08:20 - 10:00 Room 104
Session WE1.104 Oral-Invited

## Sub-orbital Microwave Radiometers

Session Co-Chairs: Andreas Colliander, NASA Jet Propulsion Laboratory; Rachael Kroodsma, University of Michigan

**WE1.104.1** 08:20 **THE HURRICANE IMAGING RADIOMETER: PRESENT AND FUTURE**
*Timothy Miller, Mark James, Jason Roberts, Sayak Biswas, Daniel Cecil, NASA Marshall Space Flight Center, United States; W Linwood Jones, James Johnson, Spencer Farrar, Saleem Sahawneh, University of Central Florida, United States; Christopher S. Ruf, Mary Morris, University of Michigan, United States; Eric Uhlhorn, National Oceanic and Atmospheric Administration, United States; Peter Black, SAIC Inc., United States*

**WE1.104.2** 08:40 **THE HIGH ALTITUDE MMIC SOUNDING RADIOMETER ON THE GLOBAL HAWK – FROM TECHNOLOGY DEVELOPMENT TO SCIENCE DISCOVERY**
*Shannon T. Brown, Richard Denning, Bjorn Lambrigtsen, Boon Lim, Jordan Tanabe, Alan B. Tanner, Jet Propulsion Laboratory, United States*

**WE1.104.3** 09:00 **THE POLARIMETRIC L-BAND MULTI-BEAM RADIOMETER**
*Jeffrey P. Walker, Monash University, Australia; Edward Kim, NASA Goddard Space Flight Center, United States; Jorg M. Hacker, Flinders University, Australia; Mark Goodberlet, ProSensing, United States; Rocco Panciera, Melbourne University, Australia; Christoph Rüdiger, Monash University, Australia*

**WE1.104.4** 09:20 **THE AIRBORNE EMIRAD L-BAND RADIOMETER SYSTEM**
*Sten Søbjærg, Steen Kristensen, Jan Balling, Niels Skou, Technical University of Denmark, Denmark*

**WE1.104.5** 09:40 **UPGRADES TO THE PASSIVE ACTIVE L/S-BAND (PALS) RADAR/RADIOMETER SYSTEM WITH IMPROVED SCANNING MECHANISM AND RFI MITIGATING DIGITAL BACKEND**
*Sidharth Misra, Todd C. Gaier, Andreas Colliander, Steven Dinardo, Barron Latham, Seth Chazanoff, Ian O'Dwyer, Douglas E. Dawson, Jet Propulsion Laboratory, United States*

Wednesday, July 24 10:30 - 12:10 Room 104
Session WE2.104 Oral

## Synthetic Aperture Microwave Radiometry and Radio-Frequency Interference Detection and Mitigation

Session Co-Chairs: François Cabot, Centre National d'Etudes Spatiales (CNES) / Centre d'Etudes Spatiales de la BIOsphère (CESBIO); William Blackwell, MIT Lincoln Laboratory

**WE2.104.1** 10:30 **SAMPLING PATTERNS AND PERSPECTIVE APPLICATIONS OF CLOCK SCANNING SYNTHETIC APERTURE IMAGING RADIOMETER**
*Cheng Zhang, Ji Wu, Hao Liu, Jingye Yan, Weiying Sun, National Space Science Center, Chinese Academy of Sciences, China*

**WE2.104.2** 10:50 **DIGITAL BACK-END FOR RFI DETECTION AND MITIGATION IN EARTH OBSERVATION**
*Giuseppe Forte, Jorge Querol, Hyuk Park, Adriano Camps, Universitat Politècnica de Catalunya (UPC), Spain*

**WE2.104.3** 11:10 **MONITORING OF RFI LOCALIZATIONS FOR THE SMOS MISSION: SEASONAL VARIATIONS AND SYSTEMATIC ERRORS**
*Yan Soldo, CNES, Centre d'Etudes Spatiales de la Biosphère, France; Ali Khazaal, Centre d'Etudes Spatiales de la BIOsphère, France; Ewa Slominska, Space Research Center, Polish Academy of Sciences, Poland; François Cabot, CNES, Centre d'Etudes Spatiales de la Biosphère, France; Rémy Fieuzal, Centre d'Etudes Spatiales de la BIOsphère, France; Yann H. Kerr, CNES, Centre d'Etudes Spatiales de la Biosphère, France*

**WE2.104.4** 11:30 **SYSTEM STUDY AND DEVELOPMENT OF AN L-BAND 1-D SYNTHETIC APERTURE RADIOMETER FOR OCEAN SALINITY MEASUREMENT**
*Hao Liu, Lijie Niu, Cheng Zhang, Xiangkun Zhang, Jingye Yan, Ji Wu, National Space Science Center, Chinese Academy of Sciences, China*

**WE2.104.5** 11:50 **FPASMR: AN L\X-BAND FULL POLARIZATION APERTURE SYNTHESIS MICROWAVE RADIOMETER**
*Yinan Li, Hao Li, Rongchuan Lv, Bing Li, Yanming Li, Shangyu Shen, Dizhu Wang, Xi'an Institute of Space Radio Technology, China*

Wednesday, July 24 13:30 - 15:10 Room 104
Session WE3.104 Oral

## Recent Technology Developments in Microwave Radiometry

Session Co-Chairs: Todd Gaier, NASA Jet Propulsion Laboratory; Adriano Camps, Universitat Politècnica de Catalunya

**WE3.104.1** 13:30 **THE CORRELATION RADIOMETER- A NEW APPLICATION IN MM-WAVE TOTAL POWER RADIOMETRY**
*Todd C. Gaier, Alan B. Tanner, Pekka Kangaslahti, Boon Lim, Jet Propulsion Laboratory, United States*

**WE3.104.2** 13:50 **AIRBORNE MICROWAVE AND WIDE-BAND MILLIMETER-WAVE RADIOMETERS TO PROVIDE HIGH-RESOLUTION WET-TROPOSPHERIC PATH DELAY CORRECTIONS FOR ALTIMETRY IN COASTAL AREAS AND OVER INLAND WATER**
*Steven C. Reising, Colorado State University, United States; Pekka Kangaslahti, Jet Propulsion Laboratory / California Institute of Technology, United States; Shannon T. Brown, Alan B. Tanner, Jet Propulsion Laboratory, United States; Sharmila Padmanabhan, Chaitali Parashare, Oliver Montes, Jet Propulsion Laboratory / California Institute of Technology, United States; Xavier Bosch-Lluis, Scott P. Nelson, Thaddeus Johnson, Victoria Hadel, Colorado State University, United States; Douglas E. Dawson, Todd C. Gaier, Jet Propulsion Laboratory, United States; Behrouz Khayatian, Jet Propulsion Laboratory / California Institute of Technology, United States; Behzad Razavi, University of California, Los Angeles, United States*

**WE3.104.3** 14:10 **CALIBRATION PARAMETERS OF SMOS REFERENCE RADIOMETERS: REVISITED**
*Andreas Colliander, Jet Propulsion Laboratory / California Institute of Technology, United States; Juha Kainulainen, Aalto University, Finland; Francesc Torres, Ignasi Corbella, Polytechnic University of Catalonia, Spain; Roger Oliva, Manuel Martín-Neira, European Space Agency, Spain*

**WE3.104.4** 14:30 **SOIL MOISTURE ACTIVE/PASSIVE (SMAP) RADIOMETER ANTENNA PATTERN CORRECTION (APC) ALGORITHM**
*Jinzheng Peng, Morgan State University / NASA Goddard Space Flight Center, United States; Jeffrey Piepmeier, Edward Kim, NASA Goddard Space Flight Center, United States*

**WE3.104.5** 14:50 **S-NPP ADVANCED TECHNOLOGY MICROWAVE SOUNDER: REFLECTOR EMISSIVITY MODEL, MITIGATION, & VERIFICATION**
*Vincent Leslie, William Blackwell, Massachusetts Institute of Technology Lincoln Laboratory, United States; Kent Anderson, Northrop Grumman Electronic Systems, United States; Edward Kim, NASA Goddard Space Flight Center, United States; F. Weng, National Oceanic and Atmospheric Administration / NESDIS, United States*

Wednesday, July 24 15:40 - 17:20 Room 104
Session WE4.104 Oral

## Microwave Radiometer Calibration and Validation

Session Co-Chairs: Edward Kim, NASA Goddard Space Flight Center; Steven C. Reising, Colorado State University

**WE4.104.1** 15:40 **IN-ORBIT VALIDATION OF SMOS FULL POLARIMETRIC EQUATIONS**
*Francesc Torres, Ignasi Corbella, Wu Lin, Nuria Duffo, Universitat Politècnica de Catalunya (UPC), Spain; Steven Delwart, Manuel Martín-Neira, European Space Agency, Italy*

**WE4.104.2** 16:00 **EARTH LIMB CALIBRATION OF SCANNING SPACEBORNE MICROWAVE RADIOMETERS**
*William Blackwell, M. DiLiberto, Vincent Leslie, A. Milstein, I. Osaretin, Massachusetts Institute of Technology Lincoln Laboratory, United States; B.S. Cohen, P.K. Dave, K. Cahoy, Massachusetts Institute of Technology, United States*

**WE4.104.3** 16:20 **SAIRPS: A GENERIC SIMULATOR FOR EVALUATION OF SYNTHETIC APERTURE INTERFEROMETRIC RADIOMETERS**
*Adriano Camps, Hyuk Park, Yujin Kang, Universitat Politècnica de Catalunya (UPC), Spain; Jose Barbosa, Jorge Bandeiras, Paula Vieira, Ana Friacas, DEIMOS ENGENHARIA, Portugal; Salvatore d'Addio, European Space Agency / ESTEC, Netherlands*

**WE4.104.4** 16:40 **SCANNING L-BAND ACTIVE PASSIVE (SLAP)–A NEW AIRBORNE SIMULATOR FOR SMAP**
*Edward Kim, Jinzheng Peng, NASA Goddard Space Flight Center, United States; Albert Wu, Emergent Space Technologies / NASA Goddard Space Flight Center, United States; Tammy Faulkner, ASRC MANAGEMENT SERVICES INC / NASA Goddard Space Flight Center, United States; Cornelis Du Toit, QSS Group / NASA Goddard Space Flight Center, United States; Victor Marrero, Mark Wong, Damon Bradley, Lynn Miles, NASA Goddard Space Flight Center, United States; Peter Young, Sigma Space / NASA Goddard Space Flight Center, United States; Steve Seufert, NASA Goddard Space Flight Center, United States*

**WE4.104.5** 17:00 **IN-ORBIT VERIFACATION OF HY-2 RADIOMETER**
*Yanming Li, Xi'an Institute of Space Radio Technology, China; Zhou Wu, National Satellite Ocean Application Service, China; Yinan Li, Rui Yu, Min Jiang, Chunyan Xia, Wenxin Chen, Xi'an Institute of Space Radio Technology, China*

Wednesday, July 24 08:20 - 10:00 Room 105
Session WE1.105 Oral

### Change Detection

Session Co-Chairs: Allan Nielsen, Technical University of Denmark; Vito Pascazio, Università degli Studi di Napoli Parthenope

**WE1.105.1** 08:20 **MULTI-SENSOR CHANGE DETECTION BASED ON NONLINEAR CANONICAL CORRELATIONS**
*Michele Volpi, Université de Lausanne, Switzerland; Frank de Morsier, École Polytechnique Fédérale de Lausanne, Switzerland; Gustavo Camps-Valls, Universitat de València, Switzerland; Mikhail Kanevski, Université de Lausanne, Switzerland; Devis Tuia, École Polytechnique Fédérale de Lausanne, Switzerland*

**WE1.105.2** 08:40 **SAR CHANGE DETECTION IN A MARKOVIAN BAYESIAN FRAMEWORK**
*Fabio Baselice, Giampaolo Ferraioli, Vito Pascazio, Università degli Studi di Napoli Parthenope, Italy*

**WE1.105.3** 09:00 **FRFT-BASED IMPROVED ALGORITHM OF UNSUPERVISED CHANGE DETECTION IN SAR IMAGES VIA PCA AND K-MEANS CLUSTERING**
*Yong-Qiang Cheng, Heng-Chao Li, Southwest Jiaotong University, China; Turgay Celik, Agency for Science, Technology, and Research (A*STAR), Singapore; Fan Zhang, Beijing University of Chemical Technology, China*

**WE1.105.4** 09:20 **AN AUTOMATED METHOD FOR NORMALISING LARGE LANDSAT TIME SERIES DATASETS TO LIKE VALUES FOR CHANGE DETECTION**
*Kimberley Opie, Neil Sims, Commonwealth Scientific and Industrial Research Organisation, Australia*

**WE1.105.5** 09:40 **AUTOMATIC DETECTION OF BURNED AREAS IN WETLANDS BY REMOTE SENSING MULTITEMPORAL IMAGES**
*Daniel Capella Zanotta, Hiran Zani, National Institute for Space Research Brazil, Brazil; Yosio Edemir Shimabukuro, National Institute for Space Research - INPE, Brazil*

Wednesday, July 24 10:30 - 12:10 Room 105
Session WE2.105 Oral

### Multi and Hyperspectral Image Analysis

Session Chair: Melba Crawford, Purdue University

**WE2.105.1** 10:30 **SEGMENTATION OF BUILT UP AREA FROM SPOT 5 MULTISPECTRAL SATELLITE IMAGES**
*Muhammad Hasnat Khurshid, National University of Sciences and Technology, Pakistan; Muhammad Faisal Khan, NUST, Pakistan*

**WE2.105.2** 10:50 **SEGMENTATION OF VERY HIGH RESOLUTION IMAGERY USING SPECTRAL AND STRUCTURAL INFORMATION**
*Jing Liu, Peijun Li, Peking University, China*

**WE2.105.3** 11:10 **JOINT SEGMENTATION AND CLASSIFICATION OF HYPERSPECTRAL IMAGE USING MEANSHIFT AND SPARSE REPRESENTATION CLASSIFIER**
*Xiangrong Zhang, Yufang Li, Yaoguo Zheng, Biao Hou, Xidian University, China; Xiaojin Hou, DFH Satellite Co. Ltd., China*

**WE2.105.4** 11:30 **RIEMANNIAN MANIFOLD LEARNING BASED K-NEAREST-NEIGHBOR FOR HYPERSPECTRAL IMAGE CLASSIFICATION**
*Yushi Chen, Zhouhan Lin, Xing Zhao, Harbin Institute of Technology, China*

**WE2.105.5** 11:50 **VISUALIZATION OF HYPERSPECTRAL IMAGERY BASED ON MANIFOLD LEARNING**
*Danping Liao, Minchao Ye, Zhejiang University, China; Sen Jia, Shenzhen University, China; Yuntao Qian, Zhejiang University, China*

Wednesday, July 24 13:30 - 15:10 Room 105
Session WE3.105 Oral

### SAR Image Analysis I

Session Co-Chairs: Stefan Uhlmann, Tampere University of Technology; Lorenzo Bruzzone, Università di Trento (RSLab)

**WE3.105.1** 13:30 **STATISTICAL ANALYSIS AND MODELING OF TERRASAR-X IMAGES FOR CFAR BASED TARGET DETECTION**
*Ni Weiping, Yan Weidong, Wu Junzheng, Gang Zheng, Ying Lu, Northwest Institute of Nuclear Technology, China*

**WE3.105.2** 13:50 **NONLOCAL-LEE FILTER FOR SAR IMAGE DESPECKLING BASED ON HYBRID PATCH SIMILARITY**
*Hua Zhong, Key Laboratory of Intelligent Perception and Image Understanding of Ministry of Education, Xidian University, China; Lu Lu, Key Laboratory of Intelligent Perception and Image Understanding of Ministry of Education, Xidian University, China; Jingjing Zhang, Key Laboratory of Intelligent Perception and Image Understanding of Ministry of Education, Xidian University, China; Shuang Wang, Key Laboratory of Intelligent Perception and Image Understanding of Ministry of Education, Xidian University, China; Xiaojin Hou, DFH Satellite Co. Ltd., China*

**WE3.105.3** 14:10 **A NOVEL MULTITEMPORAL DETECTOR FOR PRIMITIVE EXTRACTION FROM VHR SAR IMAGES**
*Carlo Marin, Francesca Bovolo, Lorenzo Bruzzone, University of Trento, Italy*

**WE3.105.4** 14:30 **RFI SUPPRESSION IN SAR BASED ON CLUTTER ESTIMATION**
*Huan Wang, Jinping Sun, Beihang University, China; Yanping Wang, Institute of Electronics, Chinese Academy of Sciences, China; Shiyi Mao, Beihang University, China*

**WE3.105.5** 14:50 **POLARIMETRIC SAR CLASSIFICATION USING VISUAL COLOR FEATURES EXTRACTED OVER PSEUDO COLOR IMAGES**
*Stefan Uhlmann, Serkan Kiranyaz, Moncef Gabbouj, Tampere University of Technology, Finland*

Wednesday, July 24 15:40 - 17:20 Room 105
Session WE4.105 Oral

### SAR Image Analysis II

**WE4.105.1** 15:40 **SAR IMAGE SHIP DETECTION BASED ON VISUAL ATTENTION MODEL**
*Biao Hou, Wei Yang, Shuang Wang, Key Laboratory of Intelligent Perception and Image Understanding of Ministry of Education of China, China; Xiaojin Hou, DFH Satellite Co. Ltd., China*

**WE4.105.2** 16:00 **DETECTION OF THICK PATCHES OF FLOATING OIL EMULSIONS USING X, C, AND L-BAND SAR DURING DEEP WATER HORIZON OIL SPILL**
*Oscar Garcia-Pineda, Ian MacDonald, Florida State University, United States; Rebecca Green, BOEM, United States*

**WE4.105.3** 16:20 **ENERGY-EFFICIENT HIGH-PERFORMANCE SAR IMAGE GEOCODING WITH NVIDIA CARMA AND ITS APPLICATION IN STEREO RADARGRAMMETRY**
*Timo Balz, Lu Zhang, Mingsheng Liao, Wuhan University, China*

**WE4.105.4** 16:40 **SCENE SCATTERING DESCRIPTOR FOR URBAN CLASSIFICATION IN VERY HIGH RESOLUTION SAR IMAGES**
*Yongke Ding, Lizhong Qiu, Shanghai Jiao Tong University, China; Ping-lv Yang, Ze-ming Zhou, PLA University of Science and Technology, China; Yuanxiang Li, Wenxian Yu, Shanghai Jiao Tong University, China*

**WE4.105.5** 17:00 **GROUND MOVING TARGET INDICATION IN A SAR IMAGE BASED ON BACKGROUND COGNITION**
*Yuan Li, Shandong Insititute of Business and Technology, China; Gaohuan Lv, Xingzhao Liu, Shanghai Jiao Tong University, China*

Wednesday, July 24 08:20 - 10:00 Room 106
Session WE1.106 Oral

## SAR Target Detection and Recognition

Session Co-Chairs: Kei Suwa, Mitsubishi Electric Corporation; Viet Thuy Vu, Blekinge Institute of Technology

**WE1.106.1** 08:20 **2DPCA-BASED TWO-DIMENSIONAL MARGINAL SAMPLE DISCRIMINANT EMBEDDING FOR SAR ATR**
*Xian Liu, Yulin Huang, Jifang Pei, Jianyu Yang, University of Electronic Science and Technology of China, China*

**WE1.106.2** 08:40 **NEAR-SPACE SLOW SAR MONO-CHANNEL MOVING TARGET DETECTION AND IMAGING**
*Qingying Yi, Zhongyu Li, Yulin Huang, Jianyu Yang, Haiguang Yang, Xiaobo Yang, University of Electronic Science and Technology of China, China*

**WE1.106.3** 09:00 **AN IMPROVED ITERATIVE CENSORING SCHEME FOR CFAR SHIP DETECTION WITH SAR IMAGES**
*Wen-Tao An, Mingsen Lin, Chunhua Xie, Xinzhe Yuan, National Satellite Ocean Application Service, China*

**WE1.106.4** 09:20 **GROUND MOVING TARGET DETECTION AND ESTIMATION WITH DIFFERENT SAR LINEAR FLIGHT TRACKS**
*Viet Thuy Vu, Thomas Sjögren, Mats Pettersson, Blekinge Institute of Technology, Sweden*

**WE1.106.5** 09:40 **IMAGE BASED APPROACH FOR TARGET DETECTION AND ROBUST TARGET VELOCITY ESTIMATION METHOD FOR MULTI-CHANNEL SAR-GMTI**
*Kei Suwa, Ryuhei Takahashi, Toshio Wakayama, Shohei Nakamura, Masafumi Iwamoto, Mitsubishi Electric Corporation, Japan*

Wednesday, July 24 10:30 - 12:10 Room 106
Session WE2.106 Oral

## SAR Processing II

Session Chair: Andrea Recchia, Politecnico di Milano

**WE2.106.1** 10:30 **A NOVEL SAR SCHEME USING CC-S BASED PHASE CODING WAVEFORM FOR ULTRA-LOW RANGE PSLR PERFORMANCE**
*Yan-Qing Zhu, Jie Chen, Hao-Jie Zhang, Peng-Bo Wang, Wei Yang, Beihang University, China*

**WE2.106.2** 10:50 **DOPPLER-RELATED FOCUSING ASPECTS IN THE TOPS IMAGING MODE**
*Marc Rodriguez-Cassola, Pau Prats-Iraola, Francesco De Zan, Rolf Scheiber, Andreas Reigber, German Aerospace Center (DLR), Germany*

**WE2.106.3** 11:10 **AN EFFICIENT METHOD FOR THE AZIMUTH COMPRESSION OF GEOSYNCHRONOUS SAR DATA THROUGH SUB-APERTURES PROCESSING**
*Michele Belotti, Politecnico di Milano, Italy; Antoni Broquetas, Universitat Politècnica de Catalunya (UPC), Spain; Antonio Leanza, Andrea Monti-Guarnieri, Andrea Recchia, Fabio Rocca, Politecnico di Milano, Italy; Josep Ruiz, Universitat Politècnica de Catalunya (UPC), Spain; Stefano Tebaldini, Politecnico di Milano, Italy*

**WE2.106.4** 11:30 **A REFINED CHIRP SCALING ALGORITHM FOR HIGH-RESOLUTION SPACEBORNE SAR BASED ON THE FOURTH-ORDER MODEL**
*Peng-Bo Wang, Yu Han, Jie Chen, Beihang University, China; Zhong-Ma Cui, Beijing Institute of Remote Sensing Equipment, China; Wei Yang, Shuang Li, Beihang University, China*

**WE2.106.5** 11:50 **SLICE CONVOLUTION BASED SLOPE ESTIMATION FOR SAR DOPPLER AMBIGUITY RESOLVER**
*Bidan Liu, Chang Liu, Yanfei Wang, Institute of Electronics, Chinese Academy of Sciences, China*

Wednesday, July 24 13:30 - 15:10 Room 106
Session WE3.106 Oral

## SAR Interferometry II

**WE3.106.1** 13:30 **A METHOD FOR INSAR PHASE-OFFSET CALCULATION WITHOUT USING GROUND CONTROL POINTS**
*Stefano Perna, IREA-CNR; Università Parthenope, Italy; Carmen Esposito, IREA-CNR; Università degli Studi del Sannio, Italy; Riccardo Lanari, Antonio Pauciullo, IREA-CNR, Italy; Christian Wimmer, Orbisat Remote Sensing, Brazil; Paolo Berardino, IREA-CNR, Italy*

**WE3.106.2** 13:50 **COMPRESSIVE SENSING ISAR IMAGING WITH STEPPED FREQUENCY CONTINUOUS WAVE VIA GINI SPARSITY**
*Can Feng, Liang Xiao, Zhihui Wei, Nanjing University of Science & Technology, China*

**WE3.106.3** 14:10 **PHASE PROPERTY IN COMPLEX-CORRELATION AND REAL-IMAGINARY-CORRELATION FILTERED SAR INTERFEROGRAMS AND ITS INFLUENCE ON DEM QUALITY**
*Ryo Natsuaki, Akira Hirose, The University of Tokyo, Japan*

**WE3.106.4** 14:30 **A PHASE OFFSET ESTIMATION BASED ON HOMOLOGUE POINTS FOR INSAR DEM GENERATION**
*Yin-wei Li, Mao-sheng Xiang, Xing-dong Liang, Li-deng Wei, Institute of Electronics, Chinese Academy of Sciences, China*

**WE3.106.5** 14:50 **APPROACH TO INSAR ATMOSPHERIC CORRECTION BY WRF MODEL AND THREE-DIMENSIONAL VARIATIONAL DATA ASSIMILATION**
*Ye Yun, Qiming Zeng, Siting Xiong, Xi'ai Cui, Jian Jiao, Peking University, China*

Wednesday, July 24 15:40 - 17:20 Room 106
Session WE4.106 Oral

## SAR Interferometry III

Session Chair: Scott Hensley, NASA Jet Propulsion Laboratory

**WE4.106.1** 15:40 **RECONSTRUCTION OF MISSING DATA IN INTERFEROMETRIC SAR SYSTEMS**
*Muriel Pinheiro, Marc Rodriguez-Cassola, Pau Prats-Iraola, Gerhard Krieger, Andreas Reigber, Alberto Moreira, German Aerospace Center (DLR), Germany*

**WE4.106.2** 16:00 **EVALUATION OF INTERFEROMETRIC SAR DEMS GENERATED USING TANDEM-X DATA**
*Rinki Deo, Surendar Manickam, Y. S. Rao, Shirish S. Gedam, Indian Institute of Technology Bombay, India*

**WE4.106.3** 16:20 **SAR IMAGE CHANGE DETECTION BASED ON OBJECT-BASED METHOD**
*Xi Ye, Hong Zhang, Chao Wang, Bo Zhang, Fan Wu, Yixian Tang, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

**WE4.106.4** 16:40 **A FLEXIBLE SCORING SYSTEM TO SIMPLIFY REFERENCE SCENE SELECTION FOR PERMANENT SCATTERER INTERFEROMETRY USING SUPPLEMENTARY DATA**
*Arvid Kuehl, Nesrin Salepci, Christian Thiel, Christiane Schmullius, Friedrich Schiller University Jena, Germany*

**WE4.106.5** 17:00 **ANALYSIS OF PS DETECTION AND PARAMETER OPTIMIZATION**
*Carmen Patrascu, University Politehnica of Bucharest, Romania; Mihai Datcu, German Aerospace Center (DLR), Romania*

Wednesday, July 24 08:20 - 10:00 Room 109
Session WE1.109 Oral

## Field Sampling and Remote Sensing

**WE1.109.1** 08:20 **OPTIMIZING THE GROUND SAMPLE COLLECTION WITH COST-SENSITIVE ACTIVE LEARNING FOR TREE SPECIES CLASSIFICATION USING HYPERSPECTRAL IMAGES**
*Claudio Persello, University of Trento, Italy; Michele Dalponte, Fondazione E. Mach, Italy; Terje Gobakken, Erik Næsset, Norwegian University of Life Sciences, Norway*

**WE1.109.2** 08:40 **UNSUPERVISED SELECTION OF TRAINING PLOTS AND TREES FOR TREE SPECIES CLASSIFICATION**
*Michele Dalponte, Research and Innovation Centre, Fondazione E. Mach, Italy; Liviu Theodor Ene, Hans Ole Ørka, Terje Gobakken, Erik Næsset, Norwegian University of Life Sciences, Norway*

**WE1.109.3** 09:00 **THE IMPACT OF SENSOR CHARACTERISTICS FOR OBTAINING ACCURATE GROUND-BASED MEASUREMENTS OF LAI**
*William Woodgate, RMIT University, CRCSI, Australia; Mathias Disney, University College London, United Kingdom; John Armston, Department of Science, Information Technology, Innovation, and the Arts, Australia; Simon Jones, Lola Suarez, RMIT University, CRCSI, Australia; Michael Hill, The University of North Dakota, United States; Phillip Wilkes, RMIT University, CRCSI, Australia; Mariela Soto-Berelov, RMIT University, Australia; Andrew Haywood, Andrew Mellor, Department of Sustainability and Environment, Australia*

**WE1.109.4** 09:20 **VALIDATION OF COARSE-RESOLUTION FRACTIONAL VEGETATION COVER PRODUCT IN HEIHE BASIN, CHINA**
*Shuai Huang, Xihan Mu, Guangjian Yan, Beijing Normal University, China*

**WE1.109.5** 09:40 **GROUND TRUTH MEASUREMENT OF TREES USING TERRESTRIAL LASER FOR SATELLITE REMOTE SENSING**
*Akira Kato, Chiba University, Japan; Justin Morgenroth, University of Canterbury, New Zealand; David Kelbe, Rochester Institute of Technology, United States; Christopher Gomez, University of Canterbury, New Zealand; Jan A.N. van Aardt, Rochester Institute of Technology, United States*

Wednesday, July 24 10:30 - 12:10 Room 109
Session WE2.109 Oral

## Vegetation I

Session Chair: Vaibhav Gupta, RMIT University

**WE2.109.1** 10:30 **GRASS: AN EXPERIMENT ON THE CAPABILITY OF AIRBORNE GNSS-R SENSORS IN SENSING SOIL MOISTURE AND VEGETATION BIOMASS**
*Simonetta Paloscia, Emanuele Santi, Giacomo Fontanelli, Simone Pettinato, IFAC-CNR, Italy; Alejandro Egido, Marco Caparrini, Erwan Motte, STARLAB, Spain; Leila Guerriero, University of Rome Tor Vergata, Italy; Nazzareno Pierdicca, Sapienza University, Italy; Nicolas Floury, European Space Agency / ESTEC, Netherlands*

**WE2.109.2** 10:50 **VIEW-ANGLE DEPENDENCIES OF VEGETATION ISOLINES FOR HIGHER-ORDER STANDARDIZATION OF SPECTRAL VEGETATION INDICES**
*Satoshi Tsuchiya, Kenta Taniguchi, Aichi Prefectural University, Japan; Kenta Obata, University of Hawaii at Manoa, United States; Masayuki Matsuoka, Kochi University, Japan; Hiroki Yoshioka, Aichi Prefectural University, Japan*

**WE2.109.3** 11:10 **A MULTI-SCALE, MULTI-TEMPORAL ANALYSIS OF NDVI IN BURNED LANDSCAPES**
*Vaibhav Gupta, Karin Reinke, Simon Jones, RMIT University, Australia*

**WE2.109.4** 11:30 **SPECTRALLY HIGH-RESOLVED SATELLITE REMOTE SENSING OF VEGETATION**
*Tobias Mahr, Max Planck Institute for Chemistry, Germany; Eva Peper, Simon Warnach, Denis Pöhler, Institute of Environmental Physics, Germany; Steffen Beirle, Kornelia Mies, Max Planck Institute for Chemistry, Germany; Ulrich Platt, Thomas Wagner, Institute of Environmental Physics, Germany*

**WE2.109.5** 11:50 **GROUND TRUTHING PROTOCOLS FOR BIOMASS ESTIMATION IN RANGELAND ENVIRONMENTS**
*Charity Mundava, Antonius,G.T. Schut, Curtin University, Australia; Richard Stovold, Western Australian Land information Authority, Landgate, Australia; Graham Donald, David W. Lamb, Precision Agriculture Research Group, University of New England, Australia; Petra Helmholz, Curtin University, Australia*

Wednesday, July 24 13:30 - 15:10 Room 109
Session WE3.109 Oral

## Vegetation II

Session Chair: Jing Chen, University of Toronto

**WE3.109.1** 13:30 **GENERATING CONSISTENT SATELLITE LAND SURFACE ALBEDO PRODUCTS ACROSS SCALES USING A DATA FUSION METHOD**
*Tao He, Shunlin Liang, University of Maryland, College Park, United States*

**WE3.109.2** 13:50 **INTEGRATING SATELLITE RETRIEVED LEAF CHLOROPHYLL INTO LAND SURFACE MODELS FOR CONSTRAINING SIMULATIONS OF WATER AND CARBON FLUXES**
*Rasmus Houborg, King Abdullah University of Science and Technology, Saudi Arabia; Alessandro Cescatti, Joint Research Centre - European Commission, Italy; Anatoly Gitelson, Center for Advanced Land Management Information Technology (CALMIT), United States*

**WE3.109.3** 14:10 **SOLVING FOR THE "B PARAMETER" USING SMOS OPTICAL THICKNESS**
*Jason Patton, Brian Hornbuckle, Iowa State University, United States*

**WE3.109.4** 14:30 **A DATA-BASED MECHANISTIC ASSIMILATION METHOD TO ESTIMATE TIME SERIES LAI**
*Hongmin Zhou, Ping Chen, Jindi Wang, Beijing Normal University, China; Shunlin Liang, University of Maryland, United States; Libiao Guo, Kai Zhang, Beijing Normal University, China*

**WE3.109.5** 14:50 **SEASONAL AND REGIONAL PATTERNS IN GLOBAL VEGETATION PHENOLOGY BASED ON AQUARIUS RADAR OBSERVATIONS**
*Kaighin McColl, Massachusetts Institute of Technology, United States; María Piles Guillem, Universitat Politècnica de Catalunya (UPC), Spain; Alexandra Konings, Dara Entekhabi, Massachusetts Institute of Technology, United States; Miriam Pablos Hernández, Universitat Politècnica de Catalunya (UPC), Spain*

Wednesday, July 24 15:40 - 17:20 Room 109
Session WE4.109 Oral

## Vegetation III

Session Co-Chairs: Jing Chen, University of Toronto; Shunlin Liang, University of Maryland

**WE4.109.1** 15:40 **EFFICIENCY OF MULTI-FREQUENCY, MULTI-POLARIZED SAR DATA TO MONITOR GROWTH STAGES OF OILPALM PLANTS IN SARAWAK, MALAYSIA**
*Ram Avtar, United Nations University, Japan; Reiichiro Ishii, Hideki Kobayashi, Hadi Fadaei, Rikie Suzuki, Japan Agency for Marine Science and Technology, Japan; Srikantha Herath, United Nations University, Japan*

**WE4.109.2** 16:00 **THE POTENTIAL OF MODIS DERIVED PHOTOCHEMICAL REFLECTANCE INDEX FOR STUDYING GROSS PRIMARY PRODUCTIVITY OF OIL PALM TREES**
*Kian Pang Tan, Kasturi Devi Kanniah, Universiti Teknologi Malaysia, Malaysia; Arthur Philip Cracknell, University of Dundee, United Kingdom*

**WE4.109.3** 16:20 **RETRIEVAL OF LEAF CHLOROPHYLL CONTENT FROM CASI, LANDSAT,CHRIS AND MERIS DATA USING A MODEL INVERSION APPROACH**
*Jing Chen, Holly Croft, University of Toronto, Canada; Yongqin Zhang, Delta State University, United States; Anita Simic, University of Toronto, Canada; Tom Noland, Ontario Ministry of Natural Resources, Canada; John Miller, Centre for Research in Earth and Space Science, Canada*

**WE4.109.4** 16:40 **FOREST BIOMASS ESTIMATION USING RADAR AND LIDAR SYNERGIES**
*Siyuan Tian, Mihai A. Tanase, Rocco Panciera, Cooperative Research Centre for Spatial Information,The University of Melbourne, Australia; Jorg M. Hacker, Flinders University, Australia; Kim Lowell, Cooperative Research Centre for Spatial Information,The University of Melbourne, Australia*

**WE4.109.5** 17:00 **DETECTION OF QUASI-CIRCULAR VEGETATION COMMUNITY PATCHES USING CIRCULAR HOUGH TRANSFORM BASED ON ZY-3 SATELLITE IMAGE IN THE YELLOW RIVER DELTA, CHINA**
*Qingsheng Liu, Yunjie Zhang, Gaohuan Liu, Chong Huang, Institute of geographic sciences and natural resources research, chinese academy of sciences, China*

Wednesday, July 24 08:20 - 10:00 Room 110
Session WE1.110 Oral

## Spectral Unmixing

**WE1.110.1** 08:20 **PERFORMANCES OF TEMPERATURE AND EMISSIVITY SEPARATION METHODS FOR HYPERSPECTRAL THERMAL DATA AFFECTED BY THE CHANGES OF SPECTRAL PROPERTIES OF SENSOR**
*Ning Wang, Yong-Gang Qian, Academy of Opto-Electronics, Chinese Academy of Sciences, China; Hua Wu, Institute of Geographical Sciences and Natural Resources Research, Chinese Academy of Sciences, China; Lingling Ma, Academy of Opto-Electronics, Chinese Academy of Sciences, China; Zhao-Liang Li, Institute of Geographical Sciences and Natural Resources Research, Chinese Academy of Sciences, China; Lingli Tang, Academy of Opto-Electronics, Chinese Academy of Sciences, China*

**WE1.110.2** 08:40 **DISTRIBUTED ALGORITHMS FOR UNMIXING HYPERSPECTRAL DATA USING NONNEGATIVE MATRIX FACTORIZATION WITH SPARSITY CONSTRAINTS**
*Stefan Robila, Daniel Ricart, Montclair State University, United States*

**WE1.110.3** 09:00 **SMOOTH SPECTRAL UNMIXING USING TOTAL VARIATION REGULARIZATION AND A FIRST ORDER ROUGHNESS PENALTY**
*Jakob Sigurdsson, Magnus O. Ulfarsson, Johannes R. Sveinsson, Jon Atli Benediktsson, University of Iceland, Iceland*

**WE1.110.4** 09:20 **SIMULTANEOUS BAND-WEIGHTING AND SPECTRAL UNMIXING FOR MULTIPLE ENDMEMBER SETS**
*Piyush Khopkar, Alina Zare, University of Missouri, United States*

**WE1.110.5** 09:40 **NONLINEAR SPECTRAL UNMIXING USING MANIFOLD LEARNING**
*Ling Ding, Ping Tang, Hongyi Li, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China*

Wednesday, July 24 10:30 - 12:10 Room 110
Session WE2.110 Oral

## Machine Learning in Hyperspectral Imagery

Session Chair: Joshua Broadwater, The Johns Hopkins University

**WE2.110.1** 10:30 **CREATE THE RELEVANT SPATIAL FILTERBANK IN THE HYPERSPECTRAL JUNGLE**
*Devis Tuia, Ecole Polytechnique Fédérale de Lausanne, Switzerland; Michele Volpi, University of Lausanne, Switzerland; Mauro Dalla-Mura, Grenoble Institute of Technology, France; Alain Rakotomamonjy, INSA Rouen, France; Remi Flamary, Université de Nice Sophia Antipolis, France*

**WE2.110.2** 10:50 **SVM MODEL SELECTION BY HIGH DIMENSIONAL MODEL REPRESENTATION**
*Huseyin Kaya, Gulsen Taskin Kaya, Istanbul Technical University, Turkey; Okan K. Ersoy, Purdue University, United States*

**WE2.110.3** 11:10 **DYNAMIC HYPERSPECTRAL EMBEDDING WITH A SPATIAL SENSITIVE GRAPH**
*Dalton Lunga, Council for Scientific and Industrial Research in South Africa, South Africa; Okan Ersoy, Purdue University, United States*

**WE2.110.4** 11:30 **SEMI-SUPERVISED HYPERSPECTRAL IMAGE CLASSIFICATION APPROACH USING SPECTRAL-SPATIAL INFORMATION**
*Masamitsu Ochiai, Yukio Kosugi, Kuniaki Uto, Tokyo Institute of Technology, Japan*

**WE2.110.5** 11:50 **SPECTRAL-SPATIAL CLASSIFICATION FOR HYPERSPECTRAL DATA USING SVM AND SUBSPACE MLR**
*Mahdi Khodadadzadeh, Jun Li, Antonio J. Plaza, University of Extremadura, Spain; Hassan Ghassemian, Tarbiat Modares University, Iran; Jose Bioucas-Dias, Instituto de Telecomunicações, Portugal*

Wednesday, July 24 13:30 - 15:10 Room 110
Session WE3.110 Oral

## Applications of Hyperspectral Sensing

Session Chair: Paul Scheunders, University of Antwerp

**WE3.110.1** 13:30 **HYPERSPECTRAL IMAGING FOR THE CHARACTERIZATION OF ATHABASCA OIL SANDS DRILL CORE**
*Michelle Speta, Benoit Rivard, Jilu Feng, Michael Lipsett, Murray Gingras, University of Alberta, Canada*

**WE3.110.2** 13:50 **DECOMPOSITION OF VOLUME SCATTERING, POLARIZED LIGHT AND CHLOROPHYLL FLUORESCENCE BY IN-SITU POLARIZATION MEASUREMENT**
*Changping Huang, CSIRO Mathematics, Informatics and Statistics, Australia; Lifu Zhang, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China; Dadong Wang, CSIRO Mathematics, Informatics and Statistics, Australia; Taixia Wu, Qingxi Tong, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China*

**WE3.110.3** 14:10 **RETRIEVAL OF TROPOSPHERIC AEROSOL PROPERTIES USING HYPERSPECTRAL IMAGING CAMERA**
*Naohiro Manago, Hayato Saito, Yusaku Mabuchi, Chiba University, Japan; Yohei Takara, Earth Blessing Agent JAPAN Co., Ltd., Japan; Makoto Suzuki, Japan Aerospace Exploration Agency, Japan; Hiroaki Kuze, Chiba University, Japan*

**WE3.110.4** 14:30 **SHORT TEMPORAL CHANGE DETECTION IN COMPLEX URBAN AREA**
*Michal Shimoni, Signal and Image Centre, Belgium; Robby Haelterman, Christiaan Perneel, Royal Military Academy, Belgium*

**WE3.110.5** 14:50 **IMPROVED ATMOSPHERIC COMPENSATION OF HYPERSPECTRAL IMAGERY USING LIDAR**
*Joshua Broadwater, Amit Banerjee, The Johns Hopkins University, United States*

Wednesday, July 24 15:40 - 17:20 Room 110
Session WE4.110 Oral-Invited

## Remote Sensing for Water Resources

Session Co-Chairs: Tom Farr, NASA Jet Propulsion Laboratory; Jessica Reeves, Stanford University

**WE4.110.1** 15:40 **WATER CYCLE CHANGE FROM A DECADE OF GRACE**
*James Famiglietti, University of California, Irvine, United States*

**WE4.110.2** 16:00 **REMOTE MONITORING OF GROUNDWATER WITH ORBITAL RADAR**
*Tom Farr, Zhen Liu, Jet Propulsion Laboratory, United States*

**WE4.110.3** 16:20 **DEVELOPMENT OF AN INTELLIGENT ENVIRONMENTAL KNOWLEDGE RECOMMENDATION SYSTEM FOR SUSTAINABLE WATER RESOURCE MANAGEMENT USING MODIS SATELLITE IMAGERY**
*Jagannath Aryal, University of Tasmania, Australia; Ritaban Dutta, Ahsan Morshed, Commonwealth Scientific and Industrial Research Organisation, Australia*

**WE4.110.4** 16:40 **TRMM LATENT HEATING RETRIEVAL AND COMPARISON WITH FIELD CAMPAIGNS AND LARGE-SCALE ANALYSES**
*Wei-Kuo Tao, NASA Goddard Space Flight Center, United States; Yukari N. Takayabu, Atmosphere and Ocean Research Institute, Japan; Steve Lang, Science Systems and Applications, Inc, United States; Shoichi Shige, Division of Earth and Planetary Sciences, Japan; William Olson, Joint Center for Earth Systems Technology, United States*

**WE4.110.5** 17:00 **DETECTION OF FLOODED VEGETATION AND MEASUREMENTS OF WATER LEVEL CHANGES USING RADARSAT-2**
*Valentin Poncos, University of Calgary / Kepler Space Inc., Canada; Stephen Molson, Molson Mapping., Canada; Andy Welch, JWRL Geomatics, Canada; Stephanie Brazeau, Public Health Agency of Canada, Canada*

Wednesday, July 24 08:20 - 10:00 Room 111
Session WE1.111 Oral

## Precipitation and Clouds II

Session Chair: Benjamin Johnson, University of Maryland, Baltimore County

**WE1.111.1** 08:20 **SNOW MEASUREMENT USING A DUAL KA-BAND RADAR SYSTEM FOR GPM/DPR ALGORITHM DEVELOPMENT**
*Masanori Nishikawa, Haruya Minda, Nagoya University, Japan; Kenji Nakamura, Dokkyo University, Japan; Katsuhiro Nakagawa, Hiroshi Hanado, National Institute of Information and Communications Technology, Japan; Yuki Kaneko, Japan Aerospace Exploration Agency, Japan; Sento Nakai, National Research Institute for Earth Science and Disaster Prevention, Japan; Toshiro Kumakura, Nagaoka University of Technology, Japan; Yasushi Fujiyoshi, Hokkaido University, Japan*

**WE1.111.2** 08:40 **POLARIZATION EFFECTS ON A SINGLE POLARIZED OFF-THE-GRID X-BAND RADAR**
*Keyla M. Mora-Navarro, University of Puerto Rico, Mayaguez Campus, Puerto Rico; Leyda León Colón, Jose Colom-Ustáriz, Sandra Cruz-Pol, Christopher Demel, Universidad de Puerto Rico, Puerto Rico*

**WE1.111.3** 09:00 **EVALUATION OF MULTISENSOR QUANTITATIVE PRECIPITATION ESTIMATION METHODOLOGIES**
*Delbert Willie, Haonan Chen, V. Chandrasekar, Colorado State University, United States; Robert Cifelli, Carroll Campbell, David Reynolds, National Oceanic and Atmospheric Administration, United States*

**WE1.111.4** 09:20 **METHODOLOGY TO SIMULATE GPM RADAR OBSERVATIONS, FROM COMBINED RADIOMETER AND RADAR MEASUREMENTS FROM TRMM AND CLOUD MODELS**
*V. Chandrasekar, Srinivasa Ramanujam, Minda Le, Colorado State University, United States*

**WE1.111.5** 09:40 **INFRARED GEOSTATIONARY SATELLITE PRECIPITATION RETRIEVALS TRAINED WITH AMSU MIT MILLIMETER-WAVE PRECIPITATION RETRIEVAL PRODUCTS**
*Chinnawat Surussavadee, Veeranan Songsom, Prince of Songkla University, Phuket Campus, Thailand*

Wednesday, July 24 10:30 - 12:10 Room 111
Session WE2.111 Oral

## Precipitation and Clouds III

Session Chair: Erich Stocker, NASA Goddard Space Flight Center

**WE2.111.1** 10:30 **RESOLVING CIRRUS OPTICAL DEPTH BIASES BETWEEN CALIOP AND MODIS USING IR RETRIEVALS FOR MODIS COLLECTION 6**
*Robert Holz, Ralph Kuehn, Steve Ackerman, University of Wisconsin-Madison Space Science and Engineering Center, United States; Andrew Heidinger, National Oceanic and Atmospheric Administration, United States; Steven Platnick, Dave Winker, Mark Vaughan, NASA, United States; Ping Yang, Texas A&M University, United States*

**WE2.111.2** 10:50 **FULL SPECTRUM BROKEN CLOUD SCENE SIMULATION**
*Steven Richtsmeier, Robert Sundberg, Spectral Sciences, Inc., United States*

**WE2.111.3** 11:10 **CORRECTING SATELLITE BASED PRECIPITATION PRODUCTS USING SMOS MEASUREMENTS**
*Thierry Pellarin, Samuel Louvet, Guillaume Quantin, Cedric Legout, Grenoble University, France*

**WE2.111.4** 11:30 **A GLOBAL MULTI-SATELLITE DROUGHT DATA SET: A BAYESIAN DATA FUSION APPROACH**
*Amir AghaKouchak, Navid Nakhjiri, Lisa Damberg, University of California, Irvine, United States*

**WE2.111.5** 11:50 **CALIBRATION OF TRMM 3B42 WITH GEOGRAPHICAL DIFFERENTIAL ANALYSIS OVER NORTHERN AMAZONIA**
*Laurent Linguet, Pierre Audois, Université des Antilles et de la Guyane, French Guiana; Isabelle Marie-Joseph, Frédérique Seyler, UMR Espace-DEV, French Guiana*

Wednesday, July 24 13:30 - 15:10 Room 111
Session WE3.111 Oral

## Aerosols and Atmospheric Chemistry II

**WE3.111.1** 13:30 **FIRST RESULTS FROM AERONET MINI-DRAGON PHOTOMETER NETWORK SET-UP AT SINGAPORE**
*Santo V. Salinas, Boon N. Chew, Astrid Muller, National University of Singapore, Singapore; Brent N. Holben, Aerosol Robotic Network, United States; Soo Chin Liew, National University of Singapore, Singapore*

**WE3.111.2** 13:50 **REAL-TIME RETRIEVAL OF DUST EMISSIONS OVER THE UAE DESERT FROM SEVIRI THERMAL BANDS**
*Nada Al Meqbali, Prashanth Reddy Marpu, Rahma Al Hashemi, Hosni Ghedira, Masdar Institute of Science and Technology, United Arab Emirates*

**WE3.111.3** 14:10 **ADVANCES ON RETRIEVAL OF AEROSOL OPTICAL DEPTH FROM METEOSAT SECOND GENERATION GEOSTATIONARY OBSERVATIONS**
*Dominique Carrer, Xavier Ceamanos, Jean-Louis Roujean, Météo-France, France; Olivier Hautecoeur, EUMETSAT, Germany*

**WE3.111.4** 14:30 **BAYESIAN INFERENCE ON INTEGRATED CONTINUITY FLUID FLOWS AND THEIR APPLICATION TO DUST AEROSOLS**
*Fabian Elias Bachl, University of Heidelberg, Germany; Paul Fieguth, University of Waterloo, Canada; Christoph S. Garbe, University of Heidelberg, Germany*

**WE3.111.5** 14:50 **SPATIAL DISTRIBUTION OF PM2.5 CONCENTRATION BASED ON AEROSOL OPTICAL THICKNESS INVERTED BY LANDSAT ETM+ DATA OVER CHENGDU**
*Weihong Han, Ling Tong, Jinping Bai, Yunping Chen, University of Electronic Science and Technology of China, China*

Wednesday, July 24 15:40 - 17:20 Room 111
Session WE4.111 Oral

## Numerical Weather Prediction and Data Assimilation II

Session Chair: Stephane Belair, Environment Canada

**WE4.111.1** 15:40 **FIFTY YEARS OF METEOROLOGICAL SATELLITES: 1960 - 2010 A SOUTHERN HEMISPHERE PERSPECTIVE**
*John Le Marshall, Paul Gregory, Jin Lee, Bureau of Meteorology, Australia; Jim Jung, JCSDA, United States; William Smith, Hampton University, United States*

**WE4.111.2** 16:00 **IMPROVING NUMERICAL WEATHER FORECAST USING MULTI-FREQUENCY PASSIVE MICROWAVE SATELLITE OBSERVATIONS AND DATA ASSIMILATION METHODS**
*Mohamed Rasmy Abdul Wahid, Toshio Koike, The University of Tokyo, Japan*

**WE4.111.3** 16:20 **ASSIMILATION OF SPACE-BASED SNOW WATER EQUIVALENT IN THE CANADIAN LAND DATA ASSIMILATION SYSTEM**
*Stephane Belair, Bernard Bilodeau, Nathalie Gauthier, Marco Carrera, Chris Derksen, Libo Wang, Environment Canada, Canada*

**WE4.111.4** 16:40 **THE DIURNAL CHARACTERISTICS OF DEEP CONVECTIVE BOUNDARY LAYER IN ARID REGIONSAD IN NORTHWESTERN CHINA**
*Sheng Wang, Qiang Zhang, Wenyu Wang, Institute of Arid Meteorology, China Meteorological Administration; Key Laboratory of Arid Climatic Change and Reducing Disaster Of Gansu Province, Key Open Laboratory of Arid Climatic Change and Reducing Disaster Of China Meteorological Administration, China*

**WE4.111.5** 17:00 **EVALUATION OF WRF PHYSICS OPTIONS FOR HIGH-RESOLUTION WEATHER FORECASTING IN TROPICS USING SATELLITE PASSIVE MILLIMETER-WAVE OBSERVATIONS**
*Chinnawat Surussavadee, Phornnarong Aonchart, Prince of Songkla University, Phuket Campus, Thailand*

Wednesday, July 24 08:20 - 10:00 Room 112
Session WE1.112 Oral-Invited

## Remote Sensing of the Littoral Zone with Electro-optical Sensors I

**WE1.112.1** 08:20 **MAPPING CHANGES IN SEAGRASS PROPERTIES FROM HIGH SPATIAL RESOLUTION SATELLITE IMAGE DATA: 2004-2013.**
*Chris Roelfsema, Mitchell Lyons, Eva Kovacs, Stuart Phinn, Matthew Dunbabin, The University of Queensland, Australia*

**WE1.112.2** 08:40 **COASTAL EROSION MAPPING THROUGH INTEGRATION OF SAR AND LANDSAT TM IMAGERY**
*Linlin Ge, Xiaojing Li, Fan Wu, Ian Turner, University of New South Wales, Australia*

**WE1.112.3** 09:00 **BATHYMETRY RETRIEVAL FROM SUB-OPTIMAL SATELLITE DATA: CAN INCREASED SPECTRAL RESOLUTION MITIGATE THE EFFECTS OF ENVIRONMENTAL FACTORS**
*Elizabeth Botha, Vittorio Brando, Erin Hestir, Janet Anstee, Ron Hoeke, Arnold Dekker, Commonwealth Scientific and Industrial Research Organisation, Australia*

**WE1.112.4** 09:20 **FHYL: FIELD SPECTRAL LIBRARIES, AIRBORNE HYPERSPECTRAL IMAGES AND TOPOGRAPHIC AND BATHYMETRIC LIDAR DATA FOR COMPLEX COASTAL MAPPING**
*Andrea Taramelli, Emiliana Valentini, Carlo Innocenti, ISPRA, Italy; Sergio Cappucci, ENEA, Italy*

**WE1.112.5** 09:40 **MAPPING NEAR SHORE BATHYMETRY USING WAVE KINEMATICS IN A TIME SERIES OF WORLDVIEW-2 SATELLITE IMAGES**
*Ron Abileah, jOmegak, United States*

Wednesday, July 24 10:30 - 12:10 Room 112
Session WE2.112 Oral-Invited

## Remote Sensing of the Littoral Zone with Electro-optical Sensors II

**WE2.112.1** 10:30 **MAXIMIZING INFORMATION CONTENT FOR DERIVING BATHYMETRY FROM THE WORLDVIEW-02 SATELLITE**
*Grzegorz Miecznik, Brett Bader, DigitalGlobe Inc., United States*

**WE2.112.2** 10:50 **SEAGRASS MEADOW DYNAMICS DERIVED FROM CLASSIFICATION OF HIGH SPATIAL RESOLUTION SATELLITE IMAGES.**
*Eva Kovacs, Chris Roelfsema, Mitchell Lyons, Stuart Phinn, The University of Queensland, Australia; Matthew Dunbabin, Commonwealth Scientific and Industrial Research Organisation, Australia*

**WE2.112.3** 11:10 **MAPPING AND MODELLING THE SPATIAL DISTRIBUTION OF MICROPHYTOBENTHOS ABUNDANCE IN HERON REEF,AUSTRALIA**
*Rodney Borrego-Acevedo, Chris Roelfsema, Alistair Grinham, Stuart Phinn, University of Queensland, Australia*

**WE2.112.4** 11:30 **IMPROVING SEAGRASS MAPPING CALIBRATION AND VALIDATION USING AN AUTONOMOUS UNDERWATER VEHICLE (AUV)**
*Mitchell Lyons, Chris Roelfsema, University of Queensland, Australia; Matthew Dunbabin, Commonwealth Scientific and Industrial Research Organisation, Australia; Kovacs Eva, Phinn Stuart, University of Queensland, Australia*

**WE2.112.5** 11:50 **GENERATION OF BATHYMETRIC MAPS WITH HIGH RESOLUTION THROUGH THE ANALYSIS OF NAUTICAL X-BAND RADAR IMAGES**
*Francesco Serafino, IREA-CNR, Italy; Giovanni Ludeno, Vitrociset S.p.A., Italy; Claudio Lugni, INSEAN-CNR, Italy; Stylianos Flampouris, Ocean Dynamics and Prediction Branch, Naval Research Laboratory, United States; Antonio Natale, IREA-CNR, Italy; Daniele Arturi, Vitrociset S.p.A., Italy; Francesco Soldovieri, IREA-CNR, Italy*

Wednesday, July 24 13:30 - 15:10 Room 112
Session WE3.112 Oral-Invited

## Recent Advances in Land Surface Data Assimilation

Session Co-Chairs: Valentijn Pauwels, Monash University; Alexander Loew, Max Planck Institute for Meteorology

**WE3.112.1** 13:30 **ASSIMILATION OF SATELLITE SOIL MOISTURE DATA INTO RAINFALL-RUNOFF MODELING FOR SEVERAL CATCHMENTS WORLDWIDE**
*Luca Brocca, Tommaso Moramarco, National Research Council, Italy; Wouter Dorigo, Wolfgang Wagner, Vienna University of Technology, Austria*

**WE3.112.2** 13:50 **OPERATIONAL DATA ASSIMILATION FOR IMPROVING HYDROLOGIC, HYDRODYNAMIC AND WATER QUALITY FORECASTING USING OPEN TOOLS**
*Albrecht Weerts, Martin Verlaan, Ghada El Serafy, Stef Hummel, Julius Sumihar, Deltares, Netherlands; Arno Kockx, Tessella, Netherlands; Nils van Velzen, Werner Kramer, VORtech, Netherlands; Sibren Loos, Deltares, Netherlands*

**WE3.112.3** 14:10 **ASSIMILATION OF SMOS DATA FOR IMPROVING SURFACE WATER MANAGEMENT**
*Hans Lievens, Ghent University, Belgium; Ahmad Al Bitar, François Cabot, Centre d'Études Spatiales de la BIOsphère, France; Gabrielle De Lannoy, NASA Goddard Space Flight Center, United States; Gift Dumedah, Monash University, Australia; Harrie-Jan Hendricks-Franssen, Forschungszentrum Juelich, Germany; Yann H. Kerr, Sat-Kumar Tomer, Olivier Merlin, Centre d'Études Spatiales de la BIOsphère, France; Ming Pan, Joshua Roundy, Alok Sahoo, Princeton University, United States; Martinus Johannes van den Berg, Ghent University, Belgium; Harry Vereecken, Forschungszentrum Juelich, Germany; Niko Verhoest, Ghent University, Belgium; Jeffrey P. Walker, Monash University, Australia; Eric Wood, Princeton University, United States; Valentijn Pauwels, Monash University, Australia*

**WE3.112.4** 14:30 **APPLICATION OF THE AUTO-TUNED LAND ASSIMILATION SYSTEM (ATLAS) TO ASCAT AND SMOS SOIL MOISTURE RETRIEVAL PRODUCTS**
*Wade Crow, USDA ARS Hydrology and Remote Sensing Laboratory, United States; Tugrul Yilmaz, SSAI/USDA Hydrology and Remote Sensing Laboratory, United States*

**WE3.112.5** 14:50 **LAND SURFACE TEMPERATURE RETRIEVAL USING HJ-1B/IRS DATA AND ANALYSIS OF ITS EFFECT**
*Sheng Zheng, Chunxiang Cao, State Key Laboratory of Remote Sensing Science, Jointly Sponsored by the Institute of Remote Sensing and Digital Earth of CAS and Beijing Normal University, China; Mengya Wang, State Key Laboratory of Remote Sensing Science, Jointly Sponsored by the Institute of Remote Sensing and Digital Earth of CAS and Beijing Normal University; University of Chinese Academy of Sciences, China; Min Xu, State Key Laboratory of Remote Sensing Science, Jointly Sponsored by the Institute of Remote Sensing and Digital Earth of CAS and Beijing Normal University, China; Shilei Lu, Division of Ecological Environment, Department of Development Planning and Assets Management, State Forestry Administration, China*

Wednesday, July 24 15:40 - 17:20 Room 112
Session WE4.112 Oral

## New SAR Missions

Session Co-Chairs: Francisco Lopez-Dekker, German Aerospace Center (DLR); Michael Ludwig, European Space Agency; Robert Wang, Institute of Electronics, Chinese Academy of Sciences

**WE4.112.1** 15:40 **KA-BAND RADAR MISSIONS FOR EARTH OBSERVATION**
*Michael Ludwig, Elena Daganzo-Eusebio, Malcolm Davidson, European Space Agency / ESTEC, Netherlands*

**WE4.112.2** 16:00 **A DUAL-FREQUENCY SPACEBORNE SAR MISSION CONCEPT**
*Paul Rosen, Yunjin Kim, Howard Eisen, Scott Shaffer, Louise Veilleux, Scott Hensley, Jet Propulsion Laboratory, United States; Manab Chakraborty, Tapan Misra, R. Satish, Deepak Putrevu, Rakesh Bhan, Indian Space Research Organisation, India*

**WE4.112.3** 16:20 **THE SENTINEL-1 C-SAR INSTRUMENT PRELAUNCH STATUS AND PERFORMANCE**
*Friedhelm Rostan, Markus Huchler, Sebastian Riegger, Astrium GmbH, Germany; Antonio Bauleo, Thales Alenia Space Italia, Italy; Ramon Torres, European Space Agency / ESTEC, Netherlands*

**WE4.112.4** 16:40 **MARITIME SURVEILLANCE CAPABILITIES OF THE RADARSAT CONSTELLATION MISSION**
*Alan Thompson, MacDonald-Dettwiler and Associates, Canada*

**WE4.112.5** 17:00 **TERRASAR NEXT GENERATION – MISSION CAPABILITIES**
*Juergen Janoth, Steffen Gantert, Thomas Schrage, Alexander Kaptein, Infoterra GmbH | Astrium Geo-Information Services, Germany*

Wednesday, July 24 08:20 - 10:00 Room 207
Session WE1.207 Oral-Invited

## SAR Polarimetry: Theory and Applications I

**WE1.207.1** 08:20 **DEVELOPMENT OF CIRCULARLY POLARIZED SYNTHETIC APERTURE RADAR ONBOARD UNMANNED AERIAL VEHICLE**
*Josaphat Tetuko Sri Sumantyo, Chiba University, Japan; Koo Voon Chet, Multimedia University, Malaysia; Robertus Heru Triharjanto, Indonesian Aeronautics and Space Agency, Indonesia*

**WE1.207.2** 08:40 **FIRST RESULTS OF MULTISPECTRAL POLARIMETRY AND SINGLE-PASS POLINSAR WITH THE F-SAR AIRBORNE SAR INSTRUMENT**
*Andreas Reigber, Konstantinos P. Papathanassiou, Marc Jäger, Rolf Scheiber, German Aerospace Center (DLR), Germany*

**WE1.207.3** 09:00 **PALSAR-2 POLARIMETRIC PERFORMANCE AND THE SIMULATION STUDY USING THE PI-SAR-L2**
*Masanobu Shimada, Manabu Watanabe, Takeshi Motooka, Yukihiro Kankaku, Japan Aerospace Exploration Agency, Japan*

**WE1.207.4** 09:20 **INFORMATION CONTENT IN COSMO-SKYMED DATA**
*Sofía Lanfri, Comisión Nacional de Actividades Espaciales - CONAE, Argentina; Gabriela Palacio, Universidad Nacional de Río Cuarto, Argentina; Mario Lanfri, Marcelo Scavuzzo, Comisión Nacional de Actividades Espaciales - CONAE, Argentina; Alejandro César Frery, Universidade Federal de Alagoas - Ufal, Brazil*

**WE1.207.5** 09:40 **ASSESSMENT OF FULLY POLARIMETRIC POLSAR REMOTE SENSING & GEOPHYSICAL STRESS-CHANGE MONITORING FOR IMPLEMENTING EQUATORIALLY ORBITING SATELLITES OVER THE SE-ASIAN BELT**
*Wolfgang Martin-Boerner, Jorge Javier Morisaki, University of Illinois, Chicago, United States*

Wednesday, July 24 10:30 - 12:10 Room 207
Session WE2.207 Oral-Invited

## SAR Polarimetry: Theory and Applications II

**WE2.207.1** 10:30 **POLSAR TIME SERIES TEMPORAL CHANGE DETECTION AND ANALYSIS WITH BINARY PARTITION TREES**
*Alberto Alonso-Gonzalez, Carlos Lopez-Martinez, Universitat Politècnica de Catalunya (UPC), Spain*

**WE2.207.2** 10:50 **REFINED SOIL MOISTURE ESTIMATION BY MEANS OF L-BAND POLARIMETRY**
*Thomas Jagdhuber, German Aerospace Center (DLR), Germany; Irena Hajnsek, ETH Zürich, Switzerland; Konstantinos P. Papathanassiou, German Aerospace Center (DLR), Germany*

**WE2.207.3** 11:10 **MULTI-INCIDENCE ANGLE APPROACH TO UNDERSTAND FULLY POLARIMETRIC SAR DATA FROM CONIFEROUS FOREST**
*Motofumi Arii, Mitsubishi space software co., ltd., Japan*

**WE2.207.4** 11:30 **POLARIMETRIC FEATURE EVALUATION FOR STRICKEN MAN_MADE OBJECT DETECTION USING FDTD POLARIMETRIC SCATTERING ANALYSIS**
*Ryoichi Sato, Yoshio Yamaguchi, Hiroyoshi Yamada, Sang-Eun Park, Niigata University, Japan*

**WE2.207.5** 11:50 **FIRST OBSERVATIONS OF THE INITIAL RADAR NODE IN THE PUERTO RICO TROPINET X-BAND POLARIMETRIC DOPPLER WEATHER TESTBED**
*Miguel B. Galvez, Colorado State University, United States; Jose Colom-Ustáriz, University of Puerto Rico, Mayaguez Campus, Puerto Rico; V. Chandrasekar, Francesc Junyent, Colorado State University, United States; Sandra Cruz-Pol, Rafael A. Rodriguez Solis, Leyda Leon, Jose J. Rosario-Colon, Benjamin De Jesus, Jose A. Ortiz, Keyla M. Mora-Navarro, University of Puerto Rico, Mayaguez Campus, Puerto Rico*

Wednesday, July 24 13:30 - 15:10 Room 207
Session WE3.207 Oral-Invited

## Signal Processing Techniques for POL-SAR and POL-inSAR Applications I

**WE3.207.1** 13:30 **CO-POLARIZATION COHERENCE SIGNATURE FOR CHARACTERIZATION OF POLARIMETRIC SAR IMAGE**
*Sang-Eun Park, Yoshio Yamaguchi, Ryoichi Sato, Hiroyoshi Yamada, Niigata University, Japan*

**WE3.207.2** 13:50 **COMPARISON OF SHIP DETECTORS USING POLARIMETRIC ALOS DATA: TOKYO BAY**
*Armando Marino, ETH Zürich, Switzerland; Mitsunobu Sugimoto, National Defence Academy (NDA), Japan; Ferdinando Nunziata, Università degli Studi di Napoli Parthenope, Italy; Irena Hajnsek, ETH Zürich / German Aerospace Center (DLR), Germany; Maurizio Migliaccio, Università degli Studi di Napoli Parthenope, Italy; Kazuo Ouchi, National Defence Academy (NDA), Japan*

**WE3.207.3** 14:10 **A STUDY OF THE RVOG COHERENT SCATTERING MODEL VALIDITY IN POLINSAR FOR FORESTS STUDIES**
*Carlos Lopez-Martinez, Alberto Alonso-Gonzalez, Universitat Politècnica de Catalunya (UPC), Spain*

**WE3.207.4** 14:30 **UNDER-FOLIAGE TARGET DETECTION USING MULTI-BASELINE L-BAND POLINSAR DATA**
*Yue Huang, Intermap Technologies Corp., Canada; Laurent Ferro-Famil, University of Rennes 1, France; Andreas Reigber, German Aerospace Center (DLR), Germany*

Wednesday, July 24 15:40 - 17:20 Room 207
Session WE4.207 Oral-Invited

## Signal Processing Techniques for POL-SAR and POL-inSAR Applications II

**WE4.207.1** 15:40 **LONG TERM RELATIVE POLARIMETRIC CALIBRATION BY NATURAL TARGETS**
*Lorenzo Iannini, POLIMI / TU-Delft, Netherlands; Stefano Tebaldini, Andrea Monti-Guarnieri, Politecnico di Milano, Italy*

**WE4.207.2** 16:00 **AN ADVANCED NON-GAUSSIAN FEATURE SPACE METHOD FOR POL-SAR IMAGE SEGMENTATION**
*Anthony Paul Doulgeris, Torbjørn Eltoft, University of Tromsø, Norway*

**WE4.207.3** 16:20 **ANALYSIS AND OPTIMIZATION OF MULTI-CIRCULAR SAR FOR FULLY POLARIMETRIC HOLOGRAPHIC TOMOGRAPHY OVER FORESTED AREAS**
*Octavio Ponce, Pau Prats-Iraola, Rolf Scheiber, Andreas Reigber, Alberto Moreira, German Aerospace Center (DLR), Germany*

**WE4.207.4** 16:40 **COMPARISON OF PARAMETRIC AND NON-PARAMETRIC APPROACHES FOR THE FULL-RANK POLARIMETRIC SAR TOMOGRAPHY OF VOLUMETRIC ENVIRONMENTS**
*Laurent Ferro-Famil, University of Rennes 1, France; Stefano Tebaldini, Politecnico Milano, Italy*

**WE4.207.5** 17:00 **SELF-ORGANIZING FEATURE MAP BASED POLARIMETRIC SAR DATA DENOISING**
*Sanjay Shitole, Y. S. Rao, B. Krishna Mohan, Indian Institute of Technology Bombay, India; Anup Kumar Das, Indian Space Research Organisation, India*

Wednesday, July 24 08:20 - 10:00 Room 208
Session WE1.208 Oral-Invited

## ALOS Follow-on Optical Mission: High Spatial/Spectral Resolution Global Observation

Session Co-Chairs: Takeo Tadono, Japan Aerospace Exploration Agency (JAXA); Akira Iwasaki, University of Tokyo

**WE1.208.1** 08:20 **WIDE SWATH AND HIGH RESOLUTION STEREO MAPPING BY PRISM-2 ONBOARD ALOS-3**
*Hiroko Imai, Fumi Ohgushi, Haruyoshi Katayama, Masakazu Sagisaka, Shinichi Suzuki, Yuji Osawa, Takeo Tadono, Japan Aerospace Exploration Agency, Japan; Masuo Takahashi, NTT DATA i Corporation, Japan*

**WE1.208.2** 08:40 **THE FLIGHT MODEL DESIGNED AND PERFORMANCES OF HYPERSPECTRAL IMAGER SUITE (HISUI)**
*Jun Tanii, Japan Space Systems, Japan; Akira Iwasaki, Univercity of Tokyo, Japan; Hitomi Inada, Yoshiyuki Ito, NEC Corporation, Japan*

**WE1.208.3** 09:00 **JAXA HIGH RESOLUTION LAND-USE AND LAND-COVER MAP OF JAPAN**
*Masuo Takahashi, Japan Aerospace Exploration Agency, Japan; Kenlo Nasahara (Nishida), Tsukuba University, Japan; Takeo Tadono, Japan Aerospace Exploration Agency, Japan; Tomohiro Watanabe, Masanori Dotsu, Toshiro Sugimura, Nobuhiro Tomiyama, Remote Sensing Technology Center of Japan, Japan*

**WE1.208.4** 09:20 **APPLICATION STUDIES OF HISUI**
*Kazuyo Hirose, Osamu Kashimura, Tomomi Takeda, Masatane Kato, Japan Space Systems, Japan*

**WE1.208.5** 09:40 **AUTOMATIC DSM GENERATION FROM ALOS PRISM**
*Junichi Takaku, Remote Sensing Technology Center of Japan, Japan; Takeo Tadono, Japan Aerospace Exploration Agency, Japan*

Wednesday, July 24 10:30 - 12:10 Room 208
Session WE2.208 Oral-Invited

## ALOS-2

Session Co-Chairs: Masanobu Shimada, Japan Aerospace Exploration Agency (JAXA); Shinnichi Suzuki, Japan Aerospace Exploration Agency (JAXA)

**WE2.208.1** 10:30 **ALOS-2 MISSION AND DEVELOPMENT STATUS**
*Yukihiro Kankaku, Shinichi Suzuki, Yuji Osawa, Japan Aerospace Exploration Agency, Japan*

**WE2.208.2** 10:50 **ALOS-2 SCIENCE PROJECT**
*Masanobu Shimada, Japan Aerospace Exploration Agency, Japan*

**WE2.208.3** 11:10 **AUTONOMOUS PRECISION ORBIT CONTROL OF ALOS-2 FOR REPEAT-PASS SAR INTERFEROMETRY**
*Toru Yamamoto, Isao Kawano, Takanori Iwata, Yoshihisa Arikawa, Hiroyuki Itoh, Japan Aerospace Exploration Agency, Japan; Masayuki Yamamoto, Ken Nakajima, Mitsubishi Space Software Co., Ltd., Japan*

**WE2.208.4** 11:30 **SYSTEM DESIGN OF WIDE SWATH, HIGH RESOLUTION, FULL POLARIMIETORIC L-BAND SAR ONBOARD ALOS-2**
*Yu Okada, Shohei Nakamura, Koichi Iribe, Yuya Yokota, Masao Tsuji, Masayoshi Tsuchida, Kenichi Hariu, Mitsubishi Electric Corporation, Japan; Yukihiro Kankaku, Shinichi Suzuki, Yuji Osawa, Masanobu Shimada, Japan Aerospace Exploration Agency, Japan*

**WE2.208.5** 11:50 **ALOS-2 ACQUISITION STRATEGY**
*Shinichi Suzuki, Yukihiro Kankaku, Masanobu Shimada, Japan Aerospace Exploration Agency, Japan*

Wednesday, July 24 13:30 - 15:10 Room 208
Session WE3.208 Oral

## Coastal Oceanography II

Session Co-Chairs: Roland Romeiser, University of Miami; Ping Chen, National University of Singapore

**WE3.208.1** 13:30 **SWELL PARAMETERS RETRIEVAL USING ALOS/PALSAR DATA**
*Yongliang Wei, Shanghai Ocean University, China; Hiroshi Kawamura, Tohoku University, Japan; Zeyan Tang, East China Sea Prediction Center, State Oceanic Administration of China, China*

**WE3.208.2** 13:50 **DETECTION, TRACKING AND FUSION OF MULTIPLE HFSW RADARS FOR SHIP TRAFFIC SURVEILLANCE: EXPERIMENTAL PERFORMANCE ASSESSMENT**
*Salvatore Maresca, Paolo Braca, Jochen Horstmann, Center for Maritime Research and Experimentation, Italy*

**WE3.208.3** 14:10 **LARGE AMPLITUDE INTERNAL WAVE EVOLUTION STUDIED BY MARINE RADAR**
*Björn Lund, Hans C. Graber, Jingshuang Xue, Roland Romeiser, University of Miami - RSMAS, United States; Emily L. Shroyer, James N. Moum, Oregon State University - CEOAS, United States*

**WE3.208.4** 14:30 **THE ANALYSIS OF SEA SURFACE DYNAMICS USING A DOPPLERIZED X-BAND RADAR**
*Joerg Seemann, Friedwart Ziemer, Helmholtz Zentrum Geesthacht, Germany; Li-Chung Wu, National Cheng Kung University, Taiwan; Marius Cysewski, Helmholtz Zentrum Geesthacht, Germany; Stylianos Flampouris, University of Southern Mississippi, Stennis Space Center, United States*

**WE3.208.5** 14:50 **COASTAL AND MARINE HABITAT MAPPING FOR THE STRAITS OF MALACCA USING SPOT AND LANDSAT DATA**
*Ping Chen, Soo Chin Liew, National University of Singapore, Singapore; Rachel Lim, National Parks Board, Singapore; Leong Keong Kwoh, National University of Singapore, Singapore*

Wednesday, July 24 15:40 - 17:20 Room 208
Session WE4.208 Oral

## Radar in Coastal Oceanography

Session Chair: Wooil Moon, University of Manitoba

**WE4.208.1** 15:40 **REMOTE SENSING OF OYSTER REEFS AND GROUNDWATER DISCHARGE IN COASTAL AREA USING SYNTHETIC APERTURE RADAR**
*Duk-Jin Kim, Byung-Hun Choe, Seoul National University, Republic of Korea; Wooil Moon, University of Manitoba, Canada*

**WE4.208.2** 16:00 **OIL PLATFORM DETECTION BY COMPACT POLARIMETRIC SYNTHETIC APERTURE RADAR**
*Biao Zhang, Nanjing Univeristy of Information Science & Technology, China; William Perrie, Bedford Institute of Oceanography, Canada; Xiaofeng Li, Global Science and Technology at NOAA/NESDIS, United States; William Pichel, National Oceanic and Atmospheric Administration / NESDIS / STAR, United States; Zhongfeng Qiu, Yijun He, Nanjing University of Information Science & Technology, China*

**WE4.208.3** 16:20 **A SMALL-SCALE OCEANIC EDDY OFF THE COAST OF WEST AFRICA STUDIED BY MULTI-SENSOR SATELLITE AND SURFACE DRIFTER DATA, AND A NUMERICAL MODEL**
*Werner Alpers, University of Hamburg, Germany; Peter Brandt, GEOMAR, Germany; Alban Lazar, Université Pierre et Marie Curie, France; Dominique Dagorne, Institut de Recherche pour le Développement, US Imago, France; Bamol Sow, Université de Ziguinchor, Senegal; Saliou Faye, Laboratoire de Physique de l'Atmosphère et de l'Océan, Senegal; Morten Hansen, Nansen Environmental and Remote Sensing Center, Norway; Angelo Rubino, Università Ca' Foscari di Venezia, Italy; Pierre-Marie Poulain, Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS), Italy; Patrice Bremer, Institut de Recherche pour le Développement, France*

**WE4.208.4** 16:40 **THE TOPOGRAPHY COMPARSION BETWEEN THE YEAR 1999 AND 2006 OF GERMAN TIDAL FLAT WADDEN SEA ANALYZING SAR IMAGES WITH WATERLINE METHOD**
*Zhen Li, Bremen University, Germany; Georg Heygster, Universität Bremen, Germany; Justus Notholt, Bremen University, Germany*

**WE4.208.5** 17:00 **AN APPROACH TO MONITORING MANGROVES THROUGH TIME-SERIES COMPARISON OF JERS-1 SAR AND ALOS PALSAR DATA**
*Richard Lucas, Nathan Thomas, Aberystwyth University, United Kingdom; Takuya Itoh, RESTEC, Japan; Lola Fatoyinbo, NASA Goddard Space Flight Center, United States; Marc Simard, Jet Propulsion Laboratory, United States*

Thursday, July 25 | 08:20 - 10:00 | Room 101

Session TH1.101 | Oral

### Topography, Geology and Geomorphology I

**TH1.101.1** 08:20 **ESTIMATION OF CO2 BUDGET ON PEATLANDS IN INDONESIA BY USING SATELLITE BASED DATA.**
*Haemi Park, Wataru Takeuchi, University of Tokyo, Japan*

**TH1.101.2** 08:40 **DETECTION OF HYDROTHERMALLY ALTERATION ROCKS IN THE EAST GANDISE, TIBET (CHINA) USING ASTER IMAGERY**
*Zhaoqiang Huang, Institute of Mineral Resources, China Metallurgical Geology Bureau, China; Jiacai Liu, Jiangsu Province Institute of Geo-Engineering Investigation, China; Xuefeng Sun, Suqian Municipal Bureau of Land and Resources of Jiangsu Province, China*

**TH1.101.3** 09:00 **MAPPING HYDROPERIOD WITH L-BAND SAR TIME-SERIES TO IDENTIFY PERMANENT AND EPHEMERAL ARID WETLANDS**
*Rachel Melrose, University of New South Wales, Australia*

**TH1.101.4** 09:20 **PIXEL BASED TERRAIN ANALYSIS FOR LANDSLIDE HAZARD ZONATION, A CASE STUDY OF TEHRI RESERVOIR REGION, UTTARAKHAND, INDIA**
*Rohan Kumar, R Anbalagan, Indian Institute of Technology Roorkee, India*

**TH1.101.5** 09:40 **IMPACTS OF SHORELINE MORPHOLOGICAL CHANGE AND SEA LEVEL RISE ON MANGROVES; THE CASE OF THE KETA COASTAL ZONE**
*Awo Akosua Boatemaa Manson, Kwasi Appeaning Addo, Adelina Mensah, University of Ghana, Ghana*

Thursday, July 25 | 10:30 - 12:10 | Room 101

Session TH2.101 | Oral

### Wetlands I

Session Chair: Arnold Dekker, CSIRO

**TH2.101.1** 10:30 **INLAND WATER QUALITY MONITORING IN AUSTRALIA**
*Tim Malthus, Erin Hestir, Arnold Dekker, Janet Anstee, Hannelie Botha, Nagur Cherukuru, Vittorio Brando, CSIRO Land and Water, Australia; Lesley Clementsen, CSIRO Marine and Atmospheric Research, Australia; Rod Oliver, Zygmunt Lorenz, CSIRO Land and Water, Australia*

**TH2.101.2** 10:50 **COMPARISON OF MNDWI AND DFI FOR WATER MAPPING IN FLOODING SEASON**
*Muhammad Hasan Ali Baig, Lifu Zhang, Shudong Wang, Gaozhen Jiang, Shanlong Lu, Qingxi Tong, Chinese Academy of Sciences, China*

**TH2.101.3** 11:10 **KARST WATER RESOURCES DETECTION THROUGH AIRBORNE THERMAL DATA: MIVIS AND TASI-600 IMAGERY**
*Simone Pascucci, National Research Council, Italy; Lorenzo Fusilli, University of Rome La Sapienza, Italy; Angelo Palombo, Nicola Pergola, Stefano Pignatti, Federico Santini, National Research Council, Italy*

**TH2.101.4** 11:30 **SAR-BASED WATERBODY DETECTION USING MORPHOLOGICAL FEATURE EXTRACTION AND INTEGRATION**
*Xiaojing Li, Zhe Hu, Linlin Ge, University of New South Wales, Australia*

**TH2.101.5** 11:50 **ICESAT-DERIVED WATER LEVEL VARIATIONS OF ROSEIRES RESERVOIR (SUDAN) IN THE NILE BASIN**
*Zheng Duan, W.G.M Bastiaanssen, Delft University of Technology, Netherlands; Eric Muala, Water Resources Commission, Ghana*

Thursday, July 25 | 13:30 - 15:10 | Room 101

Session TH3.101 | Oral

### Integrated Earth Observing Systems II

**TH3.101.1** 13:30 **ESTIMATION AND VALIDATION OF HIGH TEMPORAL AND SPATIAL RESOLUTION ALBEDO**
*Kai Zhang, Hongmin Zhou, Jindi Wang, Beijing Normal University, China; Huazhu Xue, School of Surveying & Land Information Engineering, Henan Polytechnic University, China*

**TH3.101.2** 13:50 **COMBINING LIDAR VEGETATION PRODUCTS WITH LANDSAT TIME SERIES ARCHIVE TO ASSESS TEMPORAL CHANGES IN VEGETATION CONDITION**
*Laura Gow, Leo Lymburner, Alexis McIntyre, Larysa Halas, John Magee, Geoscience Australia, Australia*

**TH3.101.3** 14:10 **FEASIBILITY STUDIES OF SHIP DETECTIONS USING SEASONDE HF RADAR**
*Yu-Jen Chung, Laurence Z.H. Chuang, National Cheng Kung University, Taiwan; Wen-Chang Yang, Taiwan Ocean Research Institute, Taiwan*

**TH3.101.4** 14:30 **INITIAL ANALYSIS OF IMAGES FROM THE TET-1 SATELLITE SENSING SYSTEM**
*Simon Mitchell, Eckehard Lorenz, Deutsches Zentrum für Luft- und Raumfahrt, Germany*

**TH3.101.5** 14:50 **A NOVEL HIGH RESOLUTION OPTICAL SAR PROCESSOR FOR SATELLITE APPLICATIONS**
*Penghao Zhao, Kaizhi Wang, Xingzhao Liu, Shanghai Jiao Tong University, China*

Thursday, July 25 | 08:20 - 10:00 | Room 102
Session TH1.102 | Oral-Invited

## Surface Deformation in Volcanic and Seismogenic Areas by means of Advanced Remote Sensing Techniques II

**TH1.102.1** 08:20 **GROUND DEFORMATION ASSOCIATED WITH THE 2012 EMILIA (NORTHERN ITALY) SEISMIC CRISIS RETRIEVED THROUGH SPACEBORNE SAR INTERFEROMETRY**
*Manuela Bonano, Pietro Tizzani, Raffaele Castaldo, Giuseppe Solaro, Susi Pepe, Francesco Casu, Michele Manunta, Mariarosaria Manzo, Antonio Pepe, IREA-CNR, Italy; Sergey Samsonov, Canada Centre for Remote Sensing, Canada; Riccardo Lanari, Eugenio Sansosti, IREA-CNR, Italy*

**TH1.102.2** 08:40 **DETECTION AND MODELING OF THE 2011 ICHALIA (SOUTHWEST PELOPONNESE, GREECE) SEISMIC SWARM THROUGH DINSAR ANALYSIS**
*Christodoulos Kyriakopoulos, Georgia Institute of Technology, United States; Christian Bignami, Marco Chini, Salvatore Stramondo, Istituto Nazionale di Geofisica e Vulcanologia, Italy; Athanassios Ganas, Maria Kolligri, Alexandra Moshou, National Observatory of Athens, Greece*

**TH1.102.3** 09:00 **DETECTION OF SURFACE DEFORMATION ON THE VOLCÁN DE COLIMA (MEXICO) CONE AND SURROUNDING AREAS USING INSAR TECHNIQUES**
*Carlo Alberto Brunori, Christian Bignami, Istituto Nazionale di Geofisica e Vulcanologia, Italy; Francesco Zucca, Università di Pavia, Italy; Gianluca Groppelli, Gianluca Norini, Consiglio Nazionale delle Ricerche, Italy; Norma Dávila Hernández, Universidad Autónoma del Estado de México, Mexico; Salvatore Stramondo, Istituto Nazionale di Geofisica e Vulcanologia, Italy*

**TH1.102.4** 09:20 **LAND SUBSIDENCE CHARACTERISTICS OF BANDUNG BASIN AS REVEALED BY ENVISAT ASAR AND ALOS PALSAR INTERFEROMETRY**
*Linlin Ge, Alex Ng, Xiaojing Li, University of New South Wales, Australia; Hasanuddin Abidin, Irwan Gumilar, Institute of Technology Bandung (ITB), Indonesia*

Thursday, July 25 | 10:30 - 12:10 | Room 102
Session TH2.102 | Oral

## Topography, Geology & Geomorphology

**TH2.102.1** 10:30 **RECOMMENDATIONS FOR LONG-TERM OPERATIONAL DINSAR MONITORING OF MINING-INDUCED DEFORMATION IN A DYNAMIC AGRICULTURAL REGION**
*Jeanine Engelbrecht, Council for Geoscience, South Africa; Michael Inggs, University of Cape Town, South Africa*

**TH2.102.2** 10:50 **LANDSLIDE ANALYSIS THROUGH THE MULTI-SENSOR SBAS-DINSAR APPROACH: THE CASE STUDY OF ASSISI, CENTRAL ITALY**
*Fabiana Calò, IREA-CNR, Italy; Francesca Ardizzone, IRPI-CNR, Italy; Raffaele Castaldo, IREA-CNR, IRPI-CNR, Italy; Piernicola Lollino, IRPI-CNR, Italy; Pietro Tizzani, IREA-CNR, Italy; Fausto Guzzetti, IRPI-CNR, Italy; Riccardo Lanari, Michele Manunta, IREA-CNR, Italy*

**TH2.102.3** 11:10 **AN AUTOMATIC ALGORITHM FOR SLOPE ESTIMATION FROM REPEAT TRACKS OF ICESAT/GLAS**
*Xiaolu Li, Lian Ma, Duan Li, Lijun Xu, Beihang University, China*

**TH2.102.4** 11:30 **DIGITAL PHOTOGRAMMETRY OF CHINESE EARLY AERIAL PHOTO AND APPLICATION IN MORPHOTECTONICS MAPPING OF TANLU ACTIVE FAULT ZONE**
*Jingfa Zhang, Xin Wang, Institute of Crustal Dynamics, China Earthquake Administration, China*

**TH2.102.5** 11:50 **INTEGRATION OF HIGH DENSITY AIRBORNE LIDAR AND HIGH SPATIAL RESOLUTION IMAGE FOR LANDCOVER CLASSIFICATION**
*Muhammad Zulkarnain Abdul Rahman, Wan Hazli Wan Kadir, Abd Wahid Rasib, Azman Ariffin, Khamarrul Azahari Razak, Universiti Teknologi Malaysia, Malaysia*

Thursday, July 25 | 13:30 - 15:10 | Room 102
Session TH3.102 | Oral

## Earth Deformation Mapping

Session Chair: Michael Inggs, University of Cape Town

**TH3.102.1** 13:30 **ESTIMATING PLANIMETRIC ACCURACY OF AIRBORNE LIDAR USING HIGH-RESOLUTION DIGITAL AERIAL IMAGERY**
*Chunsun Zhang, RMIT University, Australia; Clive Fraser, The University of Melbourne, Australia*

**TH3.102.2** 13:50 **A RAPID LOCATION INDEPENDENT FULL TENSOR GRAVITY ALGORITHM**
*Vikram Jayaram, Kevin Crain, Randy Keller, University of Oklahoma, United States; Mark Baker, Geo Media Research and Development, United States*

**TH3.102.3** 14:10 **REMOTE PREDICTIVE MAPPING – FOR PRODUCING GEOLOGICAL MAPS OF CANADA'S ARCTIC REGIONS**
*Jeff Harris, Geological Survey of Canada, Canada*

**TH3.102.4** 14:30 **SELF-SIMILARITY OF TERRESTRIAL SURFACES AND ITS RELEVANCE TO HF SKYWAVE RADAR**
*Stuart Anderson, DSTO, Australia*

**TH3.102.5** 14:50 **LITHOLOGICAL MAPPING IN THE EASTERN SECTION OF GANGDISE, TIBET USING ASTER AND FIELD SPECTROSCOPY DATA**
*Miao Jiang, China Metallurgical Geology Bureau, China; Yi Lin, Peking University, China; Zhaoqiang Huang, China Metallurgical Geology Bureau, China*

Thursday, July 25 | 15:40 - 17:20 | Room 102
Session TH4.102 | Oral

## Recent Advances in Ocean Altimetry

Session Chair: William Emery, University of Colorado

**TH4.102.1** 15:40 **COMPARISON OF GNSS-R PROCESSING TECHNIQUES FOR SPACEBORNE OCEAN ALTIMETRY**
*Francisco Martin, Universitat Politècnica de Catalunya (UPC), Spain; Salvatore d'Addio, European Space Agency, Netherlands; Adriano Camps, Universitat Politècnica de Catalunya (UPC), Spain; Manuel Martín-Neira, European Space Agency, Netherlands; Hyuk Park, Daniel Pascual Biosca, Universitat Politècnica de Catalunya (UPC), Spain*

**TH4.102.2** 16:00 **X-BAND INTERFEROMETRIC SAR SENSOR FOR THE JAPANESE ALTIMETRY MISSION, COMPIRA**
*Akihisa Uematsu, Ryoko Nakamura, Yasuhiro Nakajima, Yukie Yajima, Japan Aerospace Exploration Agency, Japan*

**TH4.102.3** 16:20 **AIRBORNE DATA COLLECTION FOR SWOT MISSION**
*Jean-François Nouvel, Hélène Oriot, Joseph Martinot-Lagarde, ONERA, France*

**TH4.102.4** 16:40 **ASSESSMENT OF OCEAN SURFACE CURRENTS RECONSTRUCTION AT A GLOBAL SCALE FROM THE SYNERGY BETWEEN MICROWAVE AND ALTIMETRIC MEASUREMENTS**
*Cristina González-Haro, Jordi Isern-Fontanet, Institut Català de Ciències del Clima (IC3), Spain*

**TH4.102.5** 17:00 **AN ITERATIVE COASTAL ALTIMETRY RETRACKING STRATEGY BASED ON FUZZY EXPERT SYSTEM FOR IMPROVING SEA SURFACE HEIGHT ESTIMATES**
*Nurul Idris, Xiaoli Deng, The University of Newcastle, Australia*

Thursday, July 25 | 08:20 - 10:00 | Room 103
Session TH1.103 | Oral-Invited

### TanDEM-X Applications

**TH1.103.1** 08:20 **POL-INSAR FOREST TECHNIQUES AND APPLICATIONS BY MEANS OF TANDEM-X NEW RESULTS AND EXPERIMENTS**
*Florian Kugler, Astor Torano-Caicoya, Matteo Padrini, Konstantinos P. Papathanassiou, German Aerospace Center (DLR), Germany; Irena Hajnsek, ETH Zürich, Switzerland*

**TH1.103.2** 08:40 **TANDEM-X ACQUISITION AND QUALITY OVERVIEW WITH TWO GLOBAL COVERAGES**
*Benjamin Bräutigam, Paola Rizzoli, Michele Martone, Daniela Borla Tridon, Markus Bachmann, Daniel Schulze, Gerhard Krieger, German Aerospace Center (DLR), Germany*

**TH1.103.3** 09:00 **CROSS-PLATFORM SPACEBORNE SAR IMAGING: DEMONSTRATION USING TANDEM-X**
*Marc Rodriguez-Cassola, Pau Prats-Iraola, Ulrich Steinbrecher, Daniel Schulze, Gerhard Krieger, Andreas Reigber, Alberto Moreira, German Aerospace Center (DLR), Germany*

**TH1.103.4** 09:20 **DUAL-BASELINE PHASE UNWRAPPING CORRECTION FOR THE TANDEM-X MISSION: AFTER ONE YEAR EXPERIENCE**
*Marie Lachaise, Thomas Fritz, German Aerospace Center (DLR), Germany; Nestor Yague-Martinez, Technische Universität München (TUM), Germany; Helko Breit, German Aerospace Center (DLR), Germany*

**TH1.103.5** 09:40 **THE APPROACH FOR COMBINING DEM ACQUISITIONS FOR THE TANDEM-X DEM MOSAIC**
*Astrid Gruber, Birgit Wessel, Martin Huber, Markus Breunig, German Aerospace Center (DLR), Germany; Susanne Wagenbrenner, Company for Remote Sensing and Environmental Research (SLU), Germany*

Thursday, July 25 | 10:30 - 12:10 | Room 103
Session TH2.103 | Oral

### Information Extraction for Scene Interpretation

Session Chair: Dinh-Phong Vo, LTCI Telecom ParisTech

**TH2.103.1** 10:30 **KERNEL CHANGE DISCRIMINANT ANALYSIS FOR MULTITEMPORAL CLOUD MASKING**
*Luis Gómez-Chova, Emma Izquierdo-Verdiguier, Julia Amorós-López, Jordi Muñoz-Marí, Gustavo Camps-Valls, University of Valencia, Spain*

**TH2.103.2** 10:50 **SEPARATION OF MULTIPLE MICRO-DOPPLER COMPONENTS VIA PARAMETRIC SPARSE RECOVERY**
*Gang Li, Rui Zhang, Wei Rao, Xiqin Wang, Tsinghua University, China*

**TH2.103.3** 11:10 **REMOTE SENSING IMAGE REPRESENTATION BASED ON HIERARCHICAL HISTOGRAM PROPAGATION**
*Jefersson A. dos Santos, Otávio Penatti, Ricardo da S. Torres, University of Campinas, Brazil; Philippe Gosselin, Sylvie Philipp-Foliguet, ENSEA, France; Alexandre Falcão, University of Campinas, Brazil*

**TH2.103.4** 11:30 **LEARNING FUZZY RULES TO CHARACTERIZE OBJECTS OF INTEREST FROM REMOTE SENSING IMAGES**
*Bruno Belarte, Cédric Wemmert, Université de Strasbourg, France; Germain Forestier, Université de Haute Alsace, France; Manuel Grizonnet, Centre National d'Études Spatiales, France; Christiane Weber, Université de Strasbourg, France*

**TH2.103.5** 11:50 **RIVER DETECTION AND EDGE LOCATION IN SAR IMAGES USING FUZZY CLUSTERING, WTMM AND SNAKE MODEL**
*Wenguang Wang, Xiaoxia Lin, Jinping Sun, Yunneng Yuan, Beihang University, China*

Thursday, July 25 | 13:30 - 15:10 | Room 103
Session TH3.103 | Oral

### Information Extraction from SAR Images

Session Chair: Fabio Del Frate, University of Roma "Tor Vergata"

**TH3.103.1** 13:30 **QUADRATIC MODELS FOR CURVED LINE DETECTION IN SAR CCD**
*Davis King, Rhonda Phillips, Massachusetts Institute of Technology Lincoln Laboratory, United States*

**TH3.103.2** 13:50 **SPHERICITY OF COMPLEX STOCHASTIC MODELS IN MULTIVARIATE SAR IMAGES**
*Gabriel Vasile, CNRS, France; Nikola Besic, Andrei Anghel, Cornel Ioana, Jocelyn Chanussot, Grenoble Institute of Technology, France*

**TH3.103.3** 14:10 **ACTIVITY DETECTION IN SAR CCD**
*Rhonda Phillips, Massachusetts Institute of Technology Lincoln Laboratory, United States*

**TH3.103.4** 14:30 **DETAIL-PRESERVING CHANGE DETECTION FROM AMPLITUDE SAR IMAGES**
*Andrea Garzelli, Claudia Zoppetti, University of Siena, Italy*

**TH3.103.5** 14:50 **NONLINEAR PCA BASED POLARIMETRIC DECOMPOSITION**
*Ruggero Giuseppe Avezzano, University of Rome Tor Vergata, Italy; Giorgio Licciardi, Grenoble Institute of Technology, France; Fabio Del Frate, Giovanni Schiavon, University of Rome Tor Vergata, Italy; Jocelyn Chanussot, Grenoble Institute of Technology, France*

Thursday, July 25 | 15:40 - 17:20 | Room 103
Session TH4.103 | Oral

### Information Extraction for Soil and Vegetation

Session Chair: Antonio Plaza, University of Extremadura

**TH4.103.1** 15:40 **ESTIMATION OF VEGETATION CHLOROPHYLL CONTENT WITH VARIATIONAL HETEROSCEDASTIC GAUSSIAN PROCESSES**
*Miguel Lazaro-Gredilla, Universidad Carlos III de Madrid, Spain; Michalis K. Titsias, Athens University of Economics and Business, Greece; Jochem Verrelst, Gustavo Camps-Valls, Universitat de València, Spain*

**TH4.103.2** 16:00 **CHARACTERIZATION OF MATERIAL EMISSIVITY USING 4-STOKES W-BAND RADIOMETER**
*Sung-Hyun Kim, Attached Iinstitute of ETRI, Republic of Korea; Joon-Ho So, Jun-Ho Choi, Agency for Defense Development, Republic of Korea; Tae-Hong Kim, Yong-Hoon Kim, Gwangju Institute of Science and Technology, Republic of Korea*

**TH4.103.3** 16:20 **IMPROVED SIGNAL UNMIXING OF VEGETATION USING SPARSE GROUP SELECTION**
*Marian-Daniel Iordache, Flemish Institute for Technological Research, Belgium; Laurent Tits, Katholieke Universiteit Leuven, Belgium; Ben Somers, Flemish Institute for Technological Research, Belgium; Antonio J. Plaza, University of Extremadura, Spain*

**TH4.103.4** 16:40 **A NOVEL TECHNIQUE FOR TREE STEM HEIGHT ESTIMATION BY FUSING LOW DENSITY LIDAR DATA AND OPTICAL IMAGES**
*Claudia Paris, Lorenzo Bruzzone, University of Trento, Italy*

**TH4.103.5** 17:00 **TEXTURE FEATURE OF REMOTE SENSING IMAGE FOR THE RECOGNITION OF HYDROTHERMAL URANIUM ORE-FIELD IN SOUTH CHINA**
*Wei Pan, Ziying Li, Hanbo Li, Li Yin, Baochang Gong, Beijing Research Institute of Uranium Geology, China*

Thursday, July 25 | 08:20 - 10:00 | Room 104
Session TH1.104 | Oral

## Optical and Infrared Modelling II

Session Co-Chairs: Josee Levesque, Defence Research and Development Canada; Simon Jones, RMIT University

**TH1.104.1** 08:20 **LIDAR RADIATIVE TRANSFER MODELING IN THE ATMOSPHERE**
*Jean-Philippe Gastellu-Etchegorry, Tiangang Yin, Eloi Grau, Nicolas Lauret, Jeremy Rubio, CESBIO, Universite De Toulouse, France*

**TH1.104.2** 08:40 **SIMULATING SATELLITE WAVEFORM LIDAR WITH DART MODEL**
*Tiangang Yin, Jean-Philippe Gastellu-Etchegorry, Eloi Grau, Nicolas Lauret, Jeremy Rubio, CESBIO, Universite De Toulouse, France*

**TH1.104.3** 09:00 **METHODOLOGY FOR REMOTE THERMAL INFORMATION EXTRACTION FOR COOLING FACILITIES**
*Michael Cathcart, Sarah Lane, Edward Burdette, Georgia Institute of Technology, United States*

**TH1.104.4** 09:20 **IMPACT OF SURFACE EMISSIVITY AND ATMOSPHERIC CONDITIONS ON SURFACE TEMPERATURES ESTIMATED FROM TOP OF CANOPY BRIGHTNESS TEMPERATURES DERIVED FROM LANDSAT 7 DATA**
*Albert Olioso, Maria Mira, Dominique Courault, Olivier Marloie, INRA, France; Pierre Guillevic, National Oceanic and Atmospheric Administration, United States*

**TH1.104.5** 09:40 **AN APPROACH TO IMPROVE HOT SPOT EFFECT FOR THE MODIS BRDF/ALBEDO ALGORITHM**
*Ziti Jiao, Yadong Dong, Xiaowen Li, Beijing Normal University, China*

Thursday, July 25 | 10:30 - 12:10 | Room 104
Session TH2.104 | Oral

## Optical and Infrared Modelling III

Session Co-Chairs: John Kerekes, Rochester Institute of Technology; Michael Cathcart, Georgia Institute of Technology

**TH2.104.1** 10:30 **AN ALGORITHM FOR THE RETRIEVAL OF ALBEDO FORM NADIR VIEW REFLECTANCE USING PRIOR KNOWLEDGE**
*Hu Zhang, Ziti Jiao, Beijng Normal University, China; Yadong Dong, Xingying Huang, Jiayue Li, Xiaowen Li, Beijing Normal University, China*

**TH2.104.2** 10:50 **THE MULTI-ANGULAR AND MULTI-BAND MODEL FOR BRDF AND ALBEDO RETRIEVAL**
*Baocheng Dou, Jianguang Wen, Qiang Liu, State Key Laboratory of Remote Sensing Science, Jointly Sponsored by the Institute of Remote Sensing Applications of CAS and Beijing Normal University, China; Changkui Sun, China Aero Geophysical Survey & Remote Sensing Center for Land and Resources(AGRS), China; Jian Shi, Yong Tang, Nanfeng Liu, State Key Laboratory of Remote Sensing Science, Jointly Sponsored by the Institute of Remote Sensing Applications of CAS and Beijing Normal University, China*

**TH2.104.3** 11:10 **ANALYSIS ON INVERSION SATURATION OF LEAF AREA INDEX BASED ON MUTI-LAYER MODELS**
*Jing Zhao, State Key Laboratory of Remote Sensing Science, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences;University of Chinese Academy of Sciences, China; Jing Li, Qinhuo Liu, State Key Laboratory of Remote Sensing Science, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

**TH2.104.4** 11:30 **A NEW FAPAR RETRIEVAL MODEL FOR CONTINUOUS VEGETATION**
*Yuan Liu, Wenjie Fan, Xiru Xu, Gaoxing Chen, Peking University, China*

**TH2.104.5** 11:50 **EVALUATING THE USE OF PHYSICS-BASED MODELLING TO SUPPORT STUDIES INTO REFLECTIVE HYPERSPECTRAL SENSOR TARGET DETECTION PERFORMANCE**
*S. B. Carr, A. C. Brady, S. Kharabash, Defence Science and Technology Organisation, Australia*

Thursday, July 25 | 13:30 - 15:10 | Room 104
Session TH3.104 | Oral

## Optical and Infrared Modelling IV

Session Chair: Michal Shimoni, Signal and Image Centre of Royal Military Academy, Belgium

**TH3.104.1** 13:30 **PREDICTION OF SOIL ORGANIC CARBON CONTENT BY SPECTROSCOPY AT EUROPEAN SCALE USING A LOCAL PARTIAL LEAST SQUARES REGRESSION APPROACH**
*Marco Nocita, Joint Research Centre - European Commission, Italy; Antoine Stevens, Université Catholique de Louvain, Belgium; Gergely Toth, Joint Research Centre - European Commission, Italy; Bas van Wesemael, Université Catholique de Louvain, Belgium; Luca Montanarella, Joint Research Centre - European Commission, Italy*

**TH3.104.2** 13:50 **EFFECTS OF SAND GRAIN SHAPE ON THE SPECTRAL SIGNATURE OF SANDY LANDSCAPES IN THE VISIBLE DOMAIN**
*Gladimir V.G. Baranoski, Bradley W. Kimmel, Tenn F. Chen, Erik Miranda, Daniel Yim, University of Waterloo, Canada*

**TH3.104.3** 14:10 **MULTISENSORY DATA FUSION METHODS FOR THE ESTIMATION OF BEACH SEDIMENT FEATURES: MINERALOGICAL, GRAIN SIZE AND MOISTURE**
*Carlo Innocenti, Federico Filipponi, Emiliana Valentini, Andrea Taramelli, Istituto per la Protezione e la Ricerca Ambientale, Italy*

**TH3.104.4** 14:30 **DOWNWELLING SHORTWAVE SURFACE FLUX FROM MSG GEOSTATIONARY SATELLITE: IMPACT ASSESSMENT ON LAND SURFACE MODELS AND IMPROVEMENTS ON CONSIDERATION OF AEROSOL EFFECTS**
*Xavier Ceamanos, Jean-Louis Roujean, Dominique Carrer, Catherine Meurey, Météo-France, France*

**TH3.104.5** 14:50 **ESTIMATION OF FRACTION OF ABSORBED PHOTOSYNTHETICALLY ACTIVE RADIATION FROM MULTIPLE SATELLITE DATA**
*Xin Tao, Shunlin Liang, Tao He, University of Maryland, College Park, United States*

Thursday, July 25 | 15:40 - 17:20 | Room 104
Session TH4.104 | Oral-Invited

## TIR Hyperspectral Remote Sensing for the Geosciences

Session Co-Chairs: Robert Hewson, RMIT University; Chris Hecker, Faculty of Geo-Information Science and Earth Observation (ITC), University of Twente; Carlos de Souza Filho, State University of Campinas; Vittalla Shettigara, Defence Science and Technology Organisation (DSTO)

**TH4.104.1** 15:40 **QUANTITATIVE FELDSPAR MAPPING FROM AIRBORNE HYPERSPECTRAL THERMAL INFRARED DATA**
*Christoph Hecker, University of Twente, Netherlands; John H. Dilles, Oregon State University, United States; Dean N. Riley, SpecTIR, LLC, United States; Mark van der Meijde, Freek D. van der Meer, University of Twente, Netherlands*

**TH4.104.2** 16:00 **MODELLING HIGH RESOLUTION TIR SPECTRA OF ROCKS**
*Andy Green, OTBC, Australia; Martn Schodlok, Commonwealth Scientific and Industrial Research Organisation, Australia*

**TH4.104.3** 16:20 **TIR HYPERSPECTRAL INTERPRETATION OF QUARTZ CRYSTALLINITY AND COMPOSITION WITHIN SILICATE BEARING ROCKS**
*Robert Hewson, RMIT University, Australia; Thomas Cudahy, Commonwealth Scientific and Industrial Research Organisation, Australia*

**TH4.104.4** 16:40 **ERROR ANALYSIS FOR EMISSIVITY MEASUREMENT USING FTIR SPECTROMETER**
*Kai Yan, Huazhong Ren, Ronghai Hu, Xihan Mu, Zhao Liu, Guangjian Yan, Beijing Normal University, China*

**TH4.104.5** 17:00 **MID-WAVE AND THERMAL INFRARED IMAGING SPECTROSCOPY FOR ADVANCED ATMOSPHERE AND SURFACE MEASUREMENT IN THE 21ST CENTURY**
*Carlos Souza Filho, State University of Campinas, Brazil; Simon J. Hook, NASA Jet Propulsion Laboratory, United States*

Thursday, July 25 08:20 - 10:00 Room 105

Session TH1.105 Oral

## SAR Image Analysis III

Session Chair: Maurizo Migliaccio, University of Naples Parthenope

**TH1.105.1** 08:20 **AN ADAPTIVE TOTAL VARIATION REGULARIZATION METHOD FOR SAR IMAGE DESPECKLING**
*Yao Zhao, Institute of Electronics, Chinese Academy of Sciences, China; Jianguo Liu, Imperial College, United Kingdom; Bingchen Zhang, Wen Hong, Yirong Wu, Institute of Electronics, Chinese Academy of Sciences, China*

**TH1.105.2** 08:40 **RADON TRANSFORM BASED EDGE DETECTION FOR SAR IMAGERY**
*Surender Varma Gadhiraju, Biplab Banerjee, Arnab Muhuri, Avik Bhattacharya, Krishna Mohan Buddhiraju, Indian Institute of Technology Bombay, India*

**TH1.105.3** 09:00 **ANALYSIS OF POLARIMETRIC VESSEL SIGNATURES IN SAR IMAGE BASED ON POLARIMETRIC DECOMPOSITION**
*Fan Wu, Chao Wang, Hong Zhang, Bo Zhang, Yixian Tang, Center for Earth Observation and Digital Earth, Chinese Academy of Sciences, China*

**TH1.105.4** 09:20 **A NOVEL QUALITY EVALUATION ALGORITHM FOR SAR IMAGE BASED ON HUMAN VISUAL SYSTEM**
*Yu-Jing Liu, Ze Yu, Chun-Sheng Li, Beihang University, China*

**TH1.105.5** 09:40 **ANGULAR SUPERRESOLUTION FOR REAL BEAM RADAR WITH ITERATIVE ADAPTIVE APPROACH**
*Yongchao Zhang, Yin Zhang, Wenchao Li, Yulin Huang, Jianyu Yang, School of Electronic Engineering, University of Electronic Science and Technology of China, China*

Thursday, July 25 10:30 - 12:10 Room 105

Session TH2.105 Oral

## Statistical and Machine Learning Techniques

Session Co-Chairs: Lorenzo Bruzzone, University of Trento; Sidnei Sant'Anna, Instituto Nacional de Pesquisas Espaciais

**TH2.105.1** 10:30 **DEEP NEURAL NETWORKS FOR REMOTE SENSING IMAGE CLASSIFICATION**
*Mingmin Chi, Jiangfeng Bao, Yangxiu Zou, Fudan University, China; Jon Atli Benediktsson, University of Iceland, Iceland*

**TH2.105.2** 10:50 **NONLINEAR BAYESIAN UNMIXING OF GEOSPATIAL DATA BASED ON GIBBS SAMPLING**
*Ryuei Nishii, Pan Qin, Daisuke Uchi, Kyushu Univeristy, Japan*

**TH2.105.3** 11:10 **ENHANCING TIR IMAGE RESOLUTION VIA INTERACTING SEQUENTIAL BAYESIAN ESTIMATION**
*Paolo Addesso, Maurizio Longo, Rocco Restaino, Gemine Vivone, University of Salerno, Italy*

**TH2.105.4** 11:30 **DOMAIN ADAPTATION WITH HIDDEN MARKOV RANDOM FIELDS**
*Jan-Pieter Jacobs, Guy Thoonen, University of Antwerp, Belgium; Devis Tuia, Ecole Polytechnique Fédérale de Lausanne, Switzerland; Gustavo Camps-Valls, Universitat de València, Spain; Birgen Haest, VITO, Belgium; Paul Scheunders, University of Antwerp, Belgium*

**TH2.105.5** 11:50 **A NEW CONTEXTUAL VERSION OF SUPPORT VECTOR MACHINE BASED ON HYPERPLANE TRANSLATION**
*Rogerio Negri, Sidnei João Siqueira Sant'Anna, Luciano Dutra, Instituto Nacional de Pesquisas Espaciais, Brazil*

Thursday, July 25 13:30 - 15:10 Room 105

Session TH3.105 Oral

## Image Classification I

Session Chair: Jon Atli Benediktsson, University of Iceland

**TH3.105.1** 13:30 **TRANSFORMATION-INVARIANT IMAGE DESCRIPTORS FOR CHANGE MONITORING BASED ON MULTI-MODALITY IMAGERY**
*Roman Palenichka, Frederik Doyon, Ahmed Lakhssassi, Marek Zaremba, University of Quebec in Outaouais, Canada*

**TH3.105.2** 13:50 **CONNECTIVITY THRESHOLDS AND DATA TRANSFORMATIONS FOR SAMPLE SUPERVISED SEGMENT GENERATION**
*Christoff Fourie, Elisabeth Schoepfer, German Aerospace Center (DLR), Germany*

**TH3.105.3** 14:10 **COMPARISON OF VHR PANCHROMATIC TEXTURE FEATURES FOR TILLAGE MAPPING**
*Nesrine Chehata, Arnaud Le Bris, IGN, France; Philippe Lagacherie, INRA, France*

**TH3.105.4** 14:30 **A PERCEPTION-INSPIRED BUILDING INDEX FOR AUTOMATIC BUILT-UP AREA DETECTION IN HIGH-RESOLUTION SATELLITE IMAGES**
*Gang Liu, Gui-Song Xia, Xin Huang, Wen Yang, Liangpei Zhang, Wuhan University, China*

**TH3.105.5** 14:50 **A HYBRID SIMILARITY MEASURE FOR APPROXIMATE SPECTRAL CLUSTERING OF REMOTE SENSING IMAGES**
*Kadim Tasdemir, Antalya International University, Turkey*

Thursday, July 25 15:40 - 17:20 Room 105

Session TH4.105 Oral

## Image Classification II

Session Chair: Jocelyn Chanussot, INPG, Grenoble

**TH4.105.1** 15:40 **AUTOMATIC REMOTE SENSING IMAGE CLASSIFICATION METHOD BASED ON SPECTRAL ANGLE AND SPECTRAL DISTANCE**
*Zhonghua Lv, Xianchuan Yu, Zhongjun Zhang, Guian Wang, Beijing Normal University, China*

**TH4.105.2** 16:00 **URBAN LAND-COVER CLASSIFICATION FROM VERY HIGH RESOLUTION REMOTE SENSING IMAGERY**
*Safaa Bedawi, National Authority for Remote Sensing and Space Sciences, Egypt; Mohamed Moustafa, American University in Cairo, Egypt; Mohamed S. Kamel, University of Waterloo, Canada*

**TH4.105.3** 16:20 **SPATIAL CORRELATED INFORMATION BASED BATCH MODE ACTIVE LEARNING METHOD FOR REMOTE SENSING IMAGE CLASSIFICATION**
*Qian Shi, Liangpei Zhang, Bo Du, Wuhan University, China*

**TH4.105.4** 16:40 **CLASSIFICATION OF COMBINING MULTISPECTRAL IMAGES AND LIDAR DATA WITH MULTIPLE KERNEL LEARNING**
*Yanfeng Gu, Kai Feng, Baisen Liu, Nan Su, Harbin Institute of Technology, China*

**TH4.105.5** 17:00 **MULTISOURCE DATA FUSION FOR IMAGE CLASSIFICATION USING FISHER CRITERION BASED NEAREST FEATURE SPACE APPROACH**
*Yang-Lang Chang, Yi Chun Wang, Min-Yu Huang, Jin Nan Liu, Yi-Shiang Fu, National Taipei University of Technology, Taiwan; Bormin Huang, University of Wisconsin-Madison, United States; Chin-Chuan Han, National United University, Taiwan*

Thursday, July 25 | 08:20 - 10:00 | Room 106
Session TH1.106 | Oral

## Along Track SAR Inteferometry

Session Co-Chairs: Tatsuharu Kobayashi, National Institute of Information and Communications Technology; Mark Preiss, DSTO

**TH1.106.1** 08:20 **DIGITAL ELEVATION MODEL (DEM) GENERATION OF CRATERS BY AN AIRBORNE INTERFEROMETRIC SAR (PI-SAR2)**
*Tatsuharu Kobayashi, Toshihiko Umehara, Jyunpei Uemoto, Makoto Satake, Shoichiro Kojima, Takeshi Matsuoka, Akitsugu Nadai, Seiho Uratsuka, National Institute of Information and Communications Technology, Japan*

**TH1.106.2** 08:40 **DEVELOPMENT OF PI-SAR2 ALONG-TRACK INTERFEROMETRIC SAR SYSTEM**
*Shoichiro Kojima, Toshihiko Umehara, Jyunpei Uemoto, Tatsuharu Kobayashi, Makoto Satake, Seiho Uratsuka, National Institute of Information and Communications Technology, Japan*

**TH1.106.3** 09:00 **POLARIMETRIC ATI SLOW TARGET DETECTION IN A LOG LIKELIHOOD FRAMEWORK**
*Nick Stacy, Mark Preiss, Defence Science and Technology Organisation, Australia*

**TH1.106.4** 09:20 **ORTHOGONAL WAVEFORM MEASUREMENTS WITH A 4X4 MIMO RADAR IMAGING SYSTEM**
*Kyle Stewart, Ninoslav Majurec, Joel Johnson, The Ohio State University, United States*

**TH1.106.5** 09:40 **HIGH RESOLUTION SAR TARGET RECONSTRUCTION FROM COMPRESSIVE MEASUREMENTS WITH PRIOR KNOWLEDGE**
*Zaidao Wen, Biao Hou, Shuang Wang, Key Laboratory of Intelligent Perception and Image Understanding of Ministry of Education, China*

Thursday, July 25 | 10:30 - 12:10 | Room 106
Session TH2.106 | Oral

## PolSAR Methods

Session Chair: Mark Preiss, Defence Science and Technology Organisation (DSTO)

**TH2.106.1** 10:30 **A NEW METHOD BASED ON X-BRAGG MODEL FOR TARGET CHARACTERIZATION AND ITS APPLICATION TO FOREST/ NONFOREST DISCRIMINATION**
*Junjun Yin, Department of Electronic Engineering, Tsinghua University, China; Zheng-Shu Zhou, Peter Caccetta, CSIRO Mathematics, Informatics and Statistics, Australia; Jian Yang, Department of Electronic Engineering, Tsinghua University, China*

**TH2.106.2** 10:50 **USE OF POINCARE SPHERE PARAMETERS FOR FAST SUPERVISED POLSAR LAND CLASSIFICATION**
*Fang Shang, Akira Hirose, The University of Tokyo, Japan*

**TH2.106.3** 11:10 **POLARMETRIC SAR IMAGES CLASSIFICATION BASED ON SPARSE REPRESENTATION THEORY**
*Lamei Zhang, Yongyou Chen, Da Lu, Bin Zou, Harbin Institute of Technology, China*

**TH2.106.4** 11:30 **UNSUPERVISED POLSAR IMAGE CLASSIFICATION BASED ON ENSEMBLE PARTITIONING**
*Xiaoshuang Yin, Hui Song, Wen Yang, Chu He, Xin Xu, School of Electronic Information, Wuhan University, China*

**TH2.106.5** 11:50 **SINGLE-LOOK POLSAR STATISTICAL ANALYSIS USING FRACTIONAL MOMENTS OF POLARIMETRIC WHITENING FILTER**
*Salman Saeed Khan, Raffaella Guida, University of Surrey, United Kingdom*

Thursday, July 25 | 13:30 - 15:10 | Room 106
Session TH3.106 | Oral

## PolSAR Applications

Session Co-Chairs: Laurent Ferro-Famil, University Rennes 1; Stephen McNeill, Landcare Research New Zealand

**TH3.106.1** 13:30 **AN APPLICATION OF POLARIMETRIC RADAR ANALYSIS ON GEOPHYSICAL PHENOMENA**
*Takashi Shibayama, Yoshio Yamaguchi, Niigata University, Japan*

**TH3.106.2** 13:50 **RECENT ADVANCES ON SAR POLARIMETRY TO OBSERVE SURFACTANTS AND TARGETS AT SEA**
*Maurizio Migliaccio, Ferdinando Nunziata, Università degli Studi di Napoli Parthenope, Italy; Armando Marino, ETH Zürich, Switzerland; Irena Hajnsek, ETH Zürich / German Aerospace Center (DLR), Switzerland*

**TH3.106.3** 14:10 **SNOW WETNESS ESTIMATION BASED ON POL-SAR DECOMPOSITION TECHNIQUE**
*Surendar Manickam, Indian Institute of Technology Bombay, India; Gulab Singh Singh, Niigata University, Japan; Avik Bhattacharya, Gopalan Venkataraman, P. Arun Bharathi, Indian Institute of Technology Bombay, India*

**TH3.106.4** 14:30 **LOW FREQUENCY HIGH RESOLUTION SAR IMAGING AND POLARIMETRIC ANALYSIS OF A QUEENSLAND TROPICAL FOREST**
*Paul Pincus, Mark Preiss, Alvin Goh, Nick Stacy, Defence Science and Technology Organisation, Australia; Douglas Gray, University of Adelaide, Australia*

**TH3.106.5** 14:50 **UNSUPERVISED CLASSIFICATION OF POLSAR DATA BASED ON THE IMPROVED AFFINITY PROPAGATION CLUSTERING**
*Shuang Wang, Yachao Liu, Kun Liu, Xidian University, China; Xiaojin Hou, DFH Satellite Co. Ltd, China; Biao Hou, Xidian University, China*

Thursday, July 25 | 15:40 - 17:20 | Room 106
Session TH4.106 | Oral

## Polarimetric Decomposition Techniques

Session Co-Chairs: Sang-Eun Park, Niigata University; Laurent Ferro-Famil, University Rennes 1

**TH4.106.1** 15:40 **A NEW COMPLETE SCATTERING POWER DECOMPOSITION SCHEME WITH APPLICATION IN DISASTER MONITORING**
*Yi Cui, Yoshio Yamaguchi, Niigata University, Japan*

**TH4.106.2** 16:00 **FULL-POL-SAR DECOMPOSITION SCHEME OVER WET SNOW AREAS**
*Gulab Singh Singh, Sang-Eun Park, Yoshio Yamaguchi, Niigata University, Japan; Wolfgang-Martin Borner, UIC, United States; Gopalan Venkataraman, Indian Institute of Technology Bombay, India*

**TH4.106.3** 16:20 **FREEMAN'S DECOMPOSITION MODEL BASED NEW SPILL DETECTOR**
*Fan Yang, Jian Yang, Junjun Yin, Tsinghua University, China*

**TH4.106.4** 16:40 **COHERENT DUAL-POL HH-HV SAR DATA TO EXTRACT COASTLINE**
*Ferdinando Nunziata, Maurizio Migliaccio, Università degli Studi di Napoli Parthenope, Italy*

**TH4.106.5** 17:00 **SPATIALLY ADAPTIVE SEGMENTATION FOR POLARIMETRIC SAR IMAGES BASED ON WEDGELET FRAMEWORK**
*Bin Liu, Hao Hu, Xingzhao Liu, Wenxian Yu, Shanghai Jiao Tong University, China*

Thursday, July 25 08:20 - 10:00 Room 109
Session TH1.109 Oral

### Agriculture: Active Remote Sensing for Crop Properties

Session Chair: Dharmendra Singh, Indian Institute of Technology Roorkee

**TH1.109.1** 08:20 **ESTIMATING WHEAT GROWTH FOR RADAR VEGETATATION INDICES**
*Yihyun Kim, Sukyoung Hong, Kyoungdo Lee, National Academy of Agricultural Science, Rural Development Administration, Republic of Korea; Thomas Jackson, Rajat Bindlish, Hydrology and Remote Sensing Laboratory, Agricultural Research Service, USDA, United States; Gunho Jung, National Institute of Crop Science (NICS), Republic of Korea; Soyeong Jang, Sangil Na, National Academy of Agricultural Science, Rural Development Administration, Republic of Korea*

**TH1.109.2** 08:40 **CAPABILITY OF X- AND C-BAND 2D FROM HIGH-RESOLUTION SATELLITE SAR IMAGES FOR ASSESSMENT OF BIOPHYSICAL VARIABLES IN RICE**
*Yoshio Inoue, NIAES, Japan; Eiji Sakaiya, Aomori-ITC, Japan*

**TH1.109.3** 09:00 **METHANE EMISSIONS MONITORING OF RICE FIELDS USING RADARSAT-2 DATA**
*Mingquan Jia, Ling Tong, Yan Chen, Longfei Tan, University of Electronic Science and Technology of China, China; Youchun Lu, China Centre for Resources Satellite Data and Application, China*

**TH1.109.4** 09:20 **DEFINING THE SENSITIVITY OF POLARIMETRIC PARAMETERS TO CROP RESIDUE PATTERNS DURING-HARVEST**
*Lingli Zhao, Jie Yang, Pingxiang Li, Shaoping Deng, Lu Liao, Wuhan University, China*

**TH1.109.5** 09:40 **COMBINING ENVISAT ASAR AND SPECTRAL VEGETATION INDICES TO EVALUATE GRASS PROPERTIES IN OTWAY, AUSTRALIA**
*Xin Wang, Xiaojing Li, Linlin Ge, School of Civil and Environmental Engineering, University of New South Wales, Australia*

Thursday, July 25 10:30 - 12:10 Room 109
Session TH2.109 Oral

### Agriculture: Remote Sensing of Vegetation Properties II

Session Co-Chairs: Josee Levesque, Defence Research and Development Canada; Alejandro Monsivais-Huertero, National Polytechnic Institute

**TH2.109.1** 10:30 **ASSESSMENT OF RELATIVE EFFICIENCY OF USING MODIS DATA TO WINTER WHEAT YIELD FORECASTING IN UKRAINE**
*Olga Kussul, National Technical University of Ukraine "Kyiv Polytechnic Institute", Ukraine; Nataliia Kussul, Sergii Skakun, Oleksii Kravchenko, Andrii Shelestov, Andrii Kolotii, Space Research Institute NASU-SSAU, Ukraine*

**TH2.109.2** 10:50 **WHEAT PRODUCTION FORECASTING FOR PAKISTAN FROM SATELLITE DATA**
*Jan Dempewolf, University of Maryland, United States; Bernard Adusei, Radius Technology Group, Inc, United States; Inbal Becker-Reshef, Brian Barker, Peter Potapov, Matt Hansen, Christopher Justice, University of Maryland, United States*

**TH2.109.3** 11:10 **MANAGING WHEAT FROM SPACE: LINKING MODIS NDVI AND CROP MODELS FOR AUSTRALIAN DRYLAND WHEAT**
*Eileen Perry, Elizabeth Morse-McNabb, James Nuttall, Garry O'Leary, Rob Clark, Department of Environment and Primary Industries, Australia*

**TH2.109.4** 11:30 **ESTIMATION AND MONITORING OF RICE GROWTH STAGES IN NORTHERN PART OF JAPAN USING CONSTELLATION SATELLITE AND GIS**
*Koji Wakamori, Dorj Ichikawa, Rei Niimi, Japan Manned Space Systems Corporation, Japan; Mitsuo Suzuki, Tokyo University of Agriculture, Japan*

**TH2.109.5** 11:50 **ASSIMILATING MULTI SPECTRAL DATA INTO A CROP MODEL FOR ENHANCED YIELD PREDICTION**
*Laura Giustarini, Miriam Machwitz, CRP - Gabriel Lippmann, Luxembourg; Christian Bossung, David Frantz, Thomas Udelhoven, Faculty of Geography and Geosciences, Remote Sensing & Geoinformatics Department, Trier University, Germany, Germany; Martin Schlerf, Loise Wandera, CRP - Gabriel Lippmann, Luxembourg; Holger Lilienthal, Julius Kühn Institute, Crop and soil science, Braunschweig, Germany, Germany; Patrick Matgen, CRP - Gabriel Lippmann, Luxembourg*

Thursday, July 25 13:30 - 15:10 Room 109
Session TH3.109 Oral

### Agriculture: Remote Sensing of Vegetation Properties III

**TH3.109.1** 13:30 **VALIDATION OF MODIS ALBEDO PRODUCTS WITH HIGH RESOLUTION ALBEDO ESTIMATES FROM FORMOSAT-2**
*Maria Mira, Dominique Courault, Albert Olioso, Marie Weiss, Olivier Marloie, INRA, France; Frédéric Baret, Institut National de Recherche Agronomique, France; Olivier Hagolle, CNES, Centre d'Etudes Spatiales de la Biosphère, France; Belen Gallego-Elvira, INRA, France*

**TH3.109.2** 13:50 **ESTIMATE RICE ACREAGE IN HUNAN PROVINCE USING THE CHINA ENVIRONMENT SATELLITE DATA**
*Huanxue Zhang, Qiangzi Li, Xin Du, Miao Zhang, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

**TH3.109.3** 14:10 **TEMPORAL KERNELS FOR THE IDENTIFICATION OF GRASSLAND MANAGEMENT USING TIME SERIES OF HIGH SPATIAL RESOLUTION SATELLITE IMAGES**
*Pauline Dusseux, Thomas Corpetti, Laurence Hubert-Moy, University of Rennes 2, France*

**TH3.109.4** 14:30 **APPLICATION OF REMOTE SENSING OBSERVATIONS AS APEX MODEL INPUT FOR ESTIMATING SOIL EROSION**
*Magda S. Galloza, Bernard Engel, Melba M. Crawford, Purdue University, United States; Gary Heathman, USDA, United States; Jimmy R. Williams, Blackland Research and Extension Center, United States*

**TH3.109.5** 14:50 **LAND SURFACE LEAF AREA INDEX ESTIMATION BASED ON TIME SERIES MULTI-ANGULAR REMOTE SENSING DATA**
*Libiao Guo, Jindi Wang, Zhiqiang Xiao, Hongmin Zhou, Beijing Normal University, China*

Thursday, July 25 15:40 - 17:20 Room 109
Session TH4.109 Oral

### Agriculture: Remote Sensing of Land and Water Management II

**TH4.109.1** 15:40 **SATELLITE REMOTE SENSING OF CROP WATER USE IN AN IRRIGATION AREA OF SOUTH-EAST AUSTRALIA**
*Mohammad Abuzar, Des Whitfield, Andy McAllister, Gavan Lamb, Kathryn Sheffield, Mark O'Connell, Department of Environment and Primary Industries, Australia*

**TH4.109.2** 16:00 **CROP WATER PRODUCTIVITY MAPPING USING ASTER IMAGERY FOR IRRIGATED FIELDS OF AL-KHARJ REGION IN EASTERN PROVINCE OF SAUDI ARABIA**
*V.C. Patil, K.A. Al-Gaadi, M. Rangaswamy, E. Tola, S. Marey, A. Al-Dosari, King Saud University, Saudi Arabia*

**TH4.109.3** 16:20 **THE DEVELOPMENT OF A NEW MODEL ON VEGETATION WATER CONTENT**
*Chen Du, Qingye Meng, Qiming Qin, Heng Dong, Peking University, China*

**TH4.109.4** 16:40 **EFFICIENT SAMPLING SCHEMES FOR ASSESSING SOIL TILLAGE INTENSITY**
*C. S. T. Daughtry, P. C. Beeson, USDA ARS, United States; Magda S. Galloza, Purdue University, United States; A. J. Stern, A. M. Sadeghi, E. R. Hunt, Jr., USDA ARS, United States; Melba M. Crawford, Purdue University, United States*

**TH4.109.5** 17:00 **MAPPING THE PLANTING DATES: AN EFFORT TO RETRIVE CROP PHENOLOGY INFORMATION FROM MODIS NDVI TIME SERIES IN AFRICA**
*Zhe Guo, International Food Policy Research Institute, United States*

Thursday, July 25 | 08:20 - 10:00 | Room 110
Session TH1.110 | Oral

## Land Cover Change: Global and Regional Mapping

**TH1.110.1** 08:20 **DATA CONTINUITY AND NEW OPPORTUNITIES FOR LAND COVER MONITORING**
*Adam Lewis, Geoscience Australia, Australia; Tim Malthus, Commonwealth Scientific Industrial Research Organisation, Australia*

**TH1.110.2** 08:40 **TIME SERIES ANALYSIS OF MODIS EVI DATA FOR REGULAR LAND COVER MAPPING IN VICTORIA, AUSTRALIA**
*Elizabeth Morse-McNabb, Kathryn Sheffield, Rob Clark, Department of Environment and Primary Industries, Victoria, Australia*

**TH1.110.3** 09:00 **CROP DISTRIBUTION MAPPING USING HARD AND SOFT CHANGE DETECTION METHOD WITH MULTI-TEMPORAL REMOTE SENSING IMAGES**
*Shuang Zhu, Jinshui Zhang, Wei Zhou, Guanyuan Shuai, Beijing Normal University, China; Wenna Wang, National Bureau of Statistics of China, China; Yaozhong Pan, Beijing Normal University, China*

**TH1.110.4** 09:20 **DYNAMIC LAND COVER DATASET VERSION 2: 2001-NOW...A LAND COVER ODYSSEY**
*Leo Lymburner, Peter Tan, Alexis McIntyre, Adam Lewis, Medhavy Thankappan, Geoscience Australia, Australia*

**TH1.110.5** 09:40 **HEDGEROW SEGMENTATION ON VHR OPTICAL SATELLITE IMAGES FOR HABITAT MONITORING**
*Marcela Arias, Jordi Inglada, Centre d'Études Spatiales de la BIOsphère, France; Richard Lucas, Aberystwyth University, United Kingdom; Palma Blonda, CNR-ISSIA, Italy*

Thursday, July 25 | 10:30 - 12:10 | Room 110
Session TH2.110 | Oral

## Land Cover Change: Urban

Session Chair: Cosimo Putignano, SERCO S.p.A.

**TH2.110.1** 10:30 **SIMDEO: AN INTEGRATED SYSTEM FOR LANDFILL DETECTION AND MONITORING USING EO DATA.**
*Enrico Giuseppe Cadau, Cosimo Putignano, Serco, Italy; Renato Aurigemma, Andrea Melchiorre, Eurosoft, Italy; Pasquale Bosco, Foxbit, Italy; Andrea Tesseri, Serco, Italy; Fabrizio Battazza, ASI, Italy*

**TH2.110.2** 10:50 **CHRACTERIZING URBAN LAND USE PATTERNS BY VARIOGRAMS PARAMETERS FROM MULTISPECTRAL HIGH SPATIAL RESOLUTION SATELLITE IMAGES: AN APPLICATION IN SALVADOR, BAHIA – BRAZIL**
*Daniele Barros, Escola Politecnica da USP, Brazil; Patrícia Lustosa Brito, Universidade Federal da Bahia, Brazil; Ana Paula Camargo Larocca, Mariana Abrantes Giannotti, Escola Politécnica da USP, Brazil; Eduardo Jun Shinohara, Companhia Ambiental do Estado de São Paulo, Brazil; Juliana Kolling, Linda Lee Ho, José Alberto Quintanilha, Escola Politécnica da USP, Brazil*

**TH2.110.3** 11:10 **GLOBAL LAND COVER MAPS FOR MONITORING THE REGIONAL HUMAN INDUCED CHANGES: A COMPARATIVE STUDY IN THE BRAZILIAN SAVANNA**
*Manuel Ferreira, Jovenita Santos, Federal University of Goiás, Brazil*

**TH2.110.4** 11:30 **QUANTITATIVE ASSESSMENT OF THE DIFFERENT METHODS ADDRESSING THE ENDMEMBER VARIABILITY**
*Yuhan Rao, Jin Chen, Xuehong Chen, Jianmin Wang, Beijing Normal University, China*

**TH2.110.5** 11:50 **A MODULAR NEURAL NETWORK MODEL FOR CHANGE DETECTION IN EARTH OBSERVATION IMAGERY**
*Victor-Emil Neagoe, Radu-Mihai Stoica, Alexandru-Ioan Ciurea, Polytechnic University of Bucharest, Romania*

Thursday, July 25 | 13:30 - 15:10 | Room 110
Session TH3.110 | Oral

## Land Cover Change: Optical

Session Chair: Jagannath Aryal, University of Tasmania

**TH3.110.1** 13:30 **PASTURE QUALITY ASSESSMENT IN THE BRAZILIAN SAVANNA BIOME BASED ON OPTICAL REMOTE SENSING AND WATER AVAILABILITY MEASURES**
*Laerte Ferreira, Arielle Arantes, Fanuel Garcia, Federal University of Goiás, Brazil; Wayne Walker, Woods Hole Research Center, United States*

**TH3.110.2** 13:50 **RESEARCH ON DYNAMIC EVOLUTION OF SOIL SALINIZATION IN TIANJIN COSTAL AREA USING REMOTE SENSING**
*Jun Wang, Peking University, China; Zhoujing Li, China Agricultural University, China; Xuebin Qin, Xiucheng Yang, Qiming Qin, Ning Zhang, Peking University, China*

**TH3.110.3** 14:10 **DETECTING BEETLE INFESTATIONS IN PINE FORESTS USING MODIS NDVI TIME-SERIES DATA**
*Asim Anees, Jan Olivier, Malgorzata O'Rielly, Jagannath Aryal, University of Tasmania, Australia*

**TH3.110.4** 14:30 **LAND USE AND LAND COVER INFERENCE IN LARGE AREAS USING MULTI-TEMPORAL OPTICAL SATELLITE IMAGES**
*Shutaro Hashimoto, Hokkaido University, Japan; Takeo Tadono, Japan Aerospace Exploration Agency, Japan; Masahiko Onosato, Hokkaido University, Japan; Masahiro Hori, Japan Aerospace Exploration Agency, Japan*

**TH3.110.5** 14:50 **OBJECT-BASED LAND COVER CLASSIFICATION IN HIGH SPATIAL RESOLUTION REMOTE SENSING IMAGERY OF MOUNTAIN AREA, A CASE STUDY IN MIYUN RESERVOIR AREA**
*Quanzhi Yuan, Bingfang Wu, Lei Zhang, Xiaosong Li, Qiang Xing, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

Thursday, July 25 | 15:40 - 17:20 | Room 110
Session TH4.110 | Oral

## Land Cover Change: Radar

Session Chair: Masanobu Shimada, Japan Aerospace Exploration Agency (JAXA)

**TH4.110.1** 15:40 **IMPROVED LAND-COVER MONITORING BY FUSION OF ALOS POLINSAR AND OPTICAL DATA**
*Masato Ohki, Masanobu Shimada, Japan Aerospace Exploration Agency, Japan*

**TH4.110.2** 16:00 **THE PHENOLOGY OF AN AGRICULTURAL REGION AS EXPRESSED BY POLARIMETRIC DECOMPOSITION AND VEGETATION INDICES**
*Jeanine Engelbrecht, Council for Geoscience, South Africa; Jaco Kemp, Stellenbosch University, South Africa; Michael Inggs, University of Cape Town, South Africa*

**TH4.110.3** 16:20 **MULTITEMPORAL MAPPING OF AMAZON FOREST USING ALOS/PALSAR/SCANSAR IMAGES**
*Gildardo Arango Sánchez, Yosio Edemir Shimabukuro, Dalton de Morisson Valeriano, National Institute for Space Research - INPE, Brazil*

**TH4.110.4** 16:40 **NEURAL NETWORKS ENSEMBLE FOR AUTOMATIC DETECTION OF CHANGES FROM COSMO-SKYMED SAR IMAGES**
*Fabio Del Frate, Chiara Pratola, Giovanni Schiavon, Domenico Solimini, University of Rome Tor Vergata, Italy*

**TH4.110.5** 17:00 **AUTOMATIC THRESHOLDING FOR LAND COVER CHANGE DETECTION IN SAR IMAGES**
*Bhogendra Mishra, Junichi Susaki, Kyoto University, Japan*

Thursday, July 25 08:20 - 10:00 Room 111

Session TH1.111 Oral

### Atmospheric Sounding - Spaceborne

Session Co-Chairs: William Blackwell, MIT Lincoln Laboratory; Albin Gasiewski, University of Colorado

**TH1.111.1** 08:20 **A METHOD FOR PHYSICALLY FUSING XCO2 MEASUREMENTS RETRIEVED FROM SCIAMACHY AND GOSAT**
*Tianxing Wang, Jiancheng Shi, Yingying Jing, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

**TH1.111.2** 08:40 **SPACEBORNE HF/VHF-RADAR SYSTEM FOR IONOSPHERE SOUNDING**
*Zhuo Li, Jie Chen, Chun-Sheng Li, Beihang University, China*

**TH1.111.3** 09:00 **DETECTION OF SPORADIC E LAYERS OVER THE EASTERN MEDITERRANEAN**
*Haris Haralambous, Frederick Research Center, Cyprus*

**TH1.111.4** 09:20 **THE CRIMSS EDR ALGORITHM: OPTIMIZATION AND VALIDATION WITH IN-SITU MEASUREMENTS, MODEL ANALYSIS FIELDS, AND RETRIEVAL PRODUCTS FROM HERITAGE ALGORITHMS**
*Murty Divakarla, IM Systems Group, Inc.,, United States; Chris Barnet, National Oceanic and Atmospheric Administration / NESDIS / STAR, United States; Mike Wilson, IM Systems Group, Inc.,, United States; Xu Liu, NASA Langley Research Center, United States; Degui Gu, Northrop Grumman Aerospace Systems, United States; Nick Nalli, Xiaozhen Xiong, Changyi Tan, IM Systems Group, Inc.,, United States; Eruc Maddy, Science and Technology Corporation, United States; Susan Kizer, NASA Langley Research Center, United States; Xia Ma, Denise Hagan, Northrop Grumman Aerospace Systems, United States; Mitch Goldberg, National Oceanic and Atmospheric Administration / NESDIS / JPSS, United States*

Thursday, July 25 10:30 - 12:10 Room 111

Session TH2.111 Oral

### Atmospheric Sounding - Airborne and In-Situ

Session Chair: Steven C. Reising, Colorado State University

**TH2.111.1** 10:30 **THE MICROWAVE TEMPERATURE PROFILER PERFORMANCE IN RECENT AIRBORNE CAMPAIGNS**
*Boon Lim, Michael Mahoney, Jet Propulsion Laboratory, United States; Julie Haggerty, NCAR, United States; Richard Denning, Jet Propulsion Laboratory, United States*

**TH2.111.2** 10:50 **OPEN-LOOP TRACKING OF RISING AND SETTING GNSS RADIO-OCCULTATION SIGNALS FROM AN AIRBORNE PLATFORM: SIGNAL MODEL AND STATISTICAL ANALYSIS**
*Kuo-Nung Wang, Paytsar Muradyan, James Garrison, Purdue University, United States; Jennifer Haase, University of California, San Diego, United States; Brian Murphy, Ulvi Acikoz, Purdue University, United States; Tyler Lulich, Emergent Space Technologies, United States*

**TH2.111.3** 11:10 **AN OPTICAL STEREOSCOPIC METHOD FOR RANGE-RESOLVED RETRIEVAL OF THE CROSS-PATH WIND VELOCITY**
*Shiril Tichkule, University of Colorado at Boulder, United States; Andreas Muschinski, NorthWest Research Associates, United States*

**TH2.111.4** 11:30 **SCIAMACHY: NEW ALGORITHMS FOR THE OPERATIONAL PROCESSORS**
*Günter Lichtenberg, Manfred Gottwald, Adrian Doicu, Franz Schreier, Serhyi Hrechanyy, Markus Meringer, Michael Hess, Sebastian Gimeno-Garcia, German Aerospace Center (DLR), Germany; Stefan Noël, Kai-Uwe Eichmann, Heinrich Bovensmann, Patricia Liebing, Andreas Richter, Michael Buchwitz, Alexei Rozanov, John P. Burrows, University of Bremen, Germany; J. Matthijs Krijger, Ralph Snel, Netherlands Institute for Space Research (SRON), Netherlands; Christophe Lerot, Belgian Institute for Space Aeronomy (IASB-BIRA), Belgium; Angelika Dehn, European Space Agency / ESRIN, Italy*

**TH2.111.5** 11:50 **NDSA MEASUREMENTS BETWEEN TWO COUNTER ROTATING LEO SATELLITES: PERFORMANCE EVALUATION AT GLOBAL SCALE IN KU, K AND M BANDS**
*Fabrizio Cuccoli, RaSS CNIT, Italy; Luca Facheris, CNIT, Italy; Andrea Garzelli, Claudia Zoppetti, University of Siena, Italy*

Thursday, July 25 13:30 - 15:10 Room 111

Session TH3.111 Oral

### Lidars and Forestry

Session Co-Chairs: Michael Cathcart, Georgia Institute of Technology; David Kunkee, The Aerospace Corporation

**TH3.111.1** 13:30 **STUDYING CANOPY STRUCTURE THROUGH 3-D RECONSTRUCTION OF POINT CLOUDS FROM FULL-WAVEFORM TERRESTRIAL LIDAR**
*Xiaoyuan Yang, Crystal Schaaf, University of Massachusetts Boston, United States; Alan Strahler, Zhan Li, Boston University, United States; Zhuosen Wang, University of Massachusetts Boston, United States; Tian Yao, Montclair State University, United States; Feng Zhao, University of Maryland, United States; Edward Saenz, Ian Paynter, University of Massachusetts Boston, United States; Ewan Douglas, Boston University, United States; Supriya Chakrabarti, Timothy Cook, Jason Martel, Glenn Howe, University of Massachusetts Lowell, United States; Curtis Woodcock, Boston University, United States; David L. B. Jupp, Commonwealth Scientific and Industrial Research Organisation, Australia; Darius Culvenor, Environmental Sensing Systems, Australia; Glenn Newnham, Jenny Lovell, Commonwealth Scientific and Industrial Research Organisation, Australia*

**TH3.111.2** 13:50 **PRELIMINARY LEAF AREA INDEX ESTIMATES FROM AIRBORNE SMALL FOOTPRINT FULL-WAVEFORM LIDAR DATA**
*Karolina D. Fieber, Ian J. Davenport, University of Reading, United Kingdom; Mihai A. Tanase, University of Melbourne, Australia; James M. Ferryman, Robert J. Gurney, University of Reading, United Kingdom; Jeffrey P. Walker, Monash University, Australia; Jorg M. Hacker, Flinders University, Australia*

**TH3.111.3** 14:10 **SEPARATING LEAVES FROM TRUNKS AND BRANCHES WITH DUAL-WAVELENGTH TERRESTRIAL LIDAR SCANNING**
*Zhan Li, Ewan Douglas, Alan Strahler, Boston University, United States; Crystal Schaaf, Xiaoyuan Yang, Zhuosen Wang, University of Massachusetts Boston, United States; Tian Yao, Montclair State University, United States; Feng Zhao, University of Maryland, United States; Edward Saenz, Ian Paynter, University of Massachusetts Boston, United States; Curtis Woodcock, Boston University, United States; Supriya Chakrabarti, Timothy Cook, Jason Martel, Glenn Howe, University of Massachusetts Lowell, United States; David L. B. Jupp, Darius Culvenor, Glenn Newnham, Jenny Lovell, Commonwealth Scientific and Industrial Research Organisation, Australia*

**TH3.111.4** 14:30 **RAPID CHARACTERISATION OF FOREST STRUCTURE FROM TLS AND 3D MODELLING**
*Andrew Burt, Mathias Disney, University College London, United Kingdom; Pasi Raumonen, Tampere University of Technology, Finland; John Armston, University of Queensland, Australia; Kim Calders, Wageningen University, Netherlands; Philip Lewis, University College London, United Kingdom*

**TH3.111.5** 14:50 **EXTRACTION OF DIGITAL TERRAIN MODEL (DTM) OVER VEGETATED AREA IN TROPICAL RAINFOREST USING LIDAR**
*Abd Wahid Rasib, Universiti Teknologi Malaysia, Malaysia; Zamri Ismail, Muhammad Zulkarnain Abdul Rahman, Suraya Jamaluddin, Wan Hazli Wan Kadir, Azman Ariffin, Faculty Of Geoinformation and Real Estate, Malaysia; Khamarrul Azahari Razak, Chuen Siang Kang, Universiti Teknologi Malaysia, Malaysia*

Thursday, July 25 15:40 - 17:20 Room 111

Session TH4.111 Oral

### Lidars and Environment

Session Co-Chairs: David Kunkee, The Aerospace Corporation; Michael Cathcart, Georgia Institute of Technology

**TH4.111.1** 15:40 **INVESTIGATION ON THREE KEY PROBLEMS FOR THE OPTICAL SIGNAL DETECTION IN SPACE-BORNE COHERENT WIND LIDAR**
*Long Gao, Yu-Liang Tao, Ao-You Wang, Beijing Institute of Space Mechanics & Electricity, China*

**TH4.111.2** 16:00 **FULL-WAVEFORM LIDAR SIGNAL FILTERING BASED ON EMPIRICAL MODE DECOMPOSITION METHOD**
*Duan Li, Lijun Xu, Xiaolu Li, Lian Ma, Beihang University, China*

**TH4.111.3** 16:20 **THE BENEFITS OF SPECTRAL LIDAR FOR FOPEN APPLICATIONS**
*Joshua Broadwater, Jean Dougherty, The Johns Hopkins University, United States*

**TH4.111.4** 16:40 **VOXELIZATION OF FULL WAVEFORM LIDAR DATA FOR FUSION WITH HYPERSPECTRAL IMAGERY**
*Hongzhou Wang, Craig Glennie, Saurabh Prasad, University of Houston, United States*

**TH4.111.5** 17:00 **ENHANCING CLASSIFICATION ACCURACY VIA REGISTRATION OF DISCRETE RETURN LIDAR AND AERIAL IMAGERY USING THE LEVENBERG-MARQUARDT NONLINEAR OPTIMIZATION METHOD**
*Madhurima Bandyopadhyay, Jan A.N. van Aardt, Kerry Cawse-Nicholson, Rochester Institute of Technology, United States*

Thursday, July 25 | 08:20 - 10:00 | Room 112
Session TH1.112 | Oral-Invited

## SMOS New Application and Basic Research Results I

Session Co-Chairs: Marco Carrera, Environment Canada; Maria Piles, Universitat Politècnica de Catalunya

**TH1.112.1** 08:20 **SMOS: SIGNIFICANT FINDINGS AFTER THREE YEARS AN A HALF IN ORBIT**
*Yann H. Kerr, Philippe Richaume, Ahmad AlBitar, Simone Bircher, François Cabot, Ali Khazaal, Heather Lawrence, Delphine Leroux, Olivier Merlin, Arnaud Mialon, Yan Soldo, Sat-Kumar Tomer, Centre d'Études Spatiales de la BIOsphère, France; Philippe Waldteufel, Latmos, France; Ali Mahmoodi, Array, Canada; Steven Delwart, European Space Agency / ESRIN, Italy; Jean-Pierre Wigneron, INRA EPHYSE, France; Paolo Ferrazzoli, Rachid Rahmoune, University of Rome Tor Vergata, Italy; Thierry Pellarin, LTHE, France; Matthias Drusch, European Space Agency / ESTEC, Netherlands; Eric Anterrieu, IRAP, France; Susanne Mecklenburg, European Space Agency / ESRIN, Italy*

**TH1.112.2** 08:40 **SPATIAL BIASES ANALYSIS AND MITIGATION METHODS IN SMOS IMAGES**
*Ignasi Corbella, Francesc Torres, Lin Wu, Nuria Duffo, Israel Duran, Universitat Politècnica de Catalunya (UPC), Spain; Manuel Martín-Neira, European Space Agency, Netherlands*

**TH1.112.3** 09:00 **SMOS AND AQUARIUS BRIGHTNESS TEMPERATURES COMPARISON OVER LAND AND OCEAN.**
*François Cabot, Centre d'Études Spatiales de la BIOsphère, France; Eric Anterrieu, IRAP, France; Arnaud Mialon, Yann H. Kerr, Centre d'Études Spatiales de la BIOsphère, France*

**TH1.112.4** 09:20 **LEVERAGING SIMULTANEOUS SMOS AND ASCAT SOIL MOISTURE PRODUCTS FOR ENHANCED HYDROLOGIC PREDICTION**
*Wade Crow, USDA ARS Hydrology and Remote Sensing Laboratory, United States; Fan Chen, SSAI/USDA Hydrology and Remote Sensing Laboratory, United States*

**TH1.112.5** 09:40 **CAN SMOS IMPROVE THE WEATHER FORECAST?**
*Joaquin Munoz-Sabater, Patricia de Rosnay, Clément Albergel, Lars Isaksen, European Centre for Medium Range Weather Forecasts, United Kingdom; Matthias Drusch, European Space Agency, Netherlands; Anne Fouilloux, European Centre for Medium Range Weather Forecasts, United Kingdom*

Thursday, July 25 | 10:30 - 12:10 | Room 112
Session TH2.112 | Oral-Invited

## SMOS New Application and Basic Research Results II

Session Co-Chairs: Yann Kerr, Centre d'Etudes Spatiales de la BIOsphère (CESBIO); Ewa Slominska, Space Research Center, Polish Academy of Sciences

**TH2.112.1** 10:30 **APPLICATIONS OF SMOS DATA IN AUSTRALIA**
*Christoph Rüdiger, Monash University, Australia; Clément Albergel, European Centre for Medium Range Weather Forecasts, United Kingdom; Imtiaz Dharssi, Gift Dumedah, Bureau of Meteorology, Australia; Yann H. Kerr, Olivier Merlin, Centre d'Études Spatiales de la BIOsphère, France; Luigi Renzullo, Commonwealth Scientific and Industrial Research Organisation, Australia; Jeffrey P. Walker, Monash University, Australia*

**TH2.112.2** 10:50 **SMOS L2 RETRIEVAL RESULTS OVER THE AMERICAN CONTINENT AND COMPARISONS WITH INDEPENDENT DATA SOURCES**
*Rachid Rahmoune, Yogesh Kumar Singh, Paolo Ferrazzoli, University of Rome Tor Vergata, Italy; Yann H. Kerr, Philippe Richaume, Ahmad Al Bitar, Centre d'Études Spatiales de la BIOsphère, France; Christophe Moisy, INRA, France*

**TH2.112.3** 11:10 **DO SMOS BRIGHTNESS TEMPERATURES APPROXIMATE TO THE REPORTED 15KM DISCRETE GLOBAL GRID?**
*Gift Dumedah, Jeffrey P. Walker, Christoph Rüdiger, Monash University, Australia*

**TH2.112.4** 11:30 **ON THE SYNERGY OF SMOS AND TERRA/AQUA MODIS: HIGH RESOLUTION SOIL MOISTURE MAPS IN NEAR REAL-TIME**
*María Piles Guillem, Mercè Vall-llossera Ferran, Adriano Camps, Universitat Politècnica de Catalunya (UPC), Spain; Nilda Sánchez, José Martínez Fernández, Universidad de Salamanca, Spain; Justino Martínez, Verónica González Gambau, Institut de Ciències del Mar CSIC, Spain; Ramon Riera, Diputació de Barcelona, Spain*

**TH2.112.5** 11:50 **GLOBAL DROUGHT INDEX FROM SMOS SOIL MOISTURE**
*Ahmad Al Bitar, Yann H. Kerr, Olivier Merlin, François Cabot, Centre d'Études Spatiales de la BIOsphère, France; Jean-Pierre Wigneron, EPHYSE INRA, France*

Thursday, July 25 | 13:30 - 15:10 | Room 112
Session TH3.112 | Oral-Invited

## SMOS New Application and Basic Research Results III

Session Co-Chairs: Carsten Montzka, Research Centre Jülich; Alessandra Monerris, Monash University

**TH3.112.1** 13:30 **L-BAND CHARACTERIZATION OF DOME-C REGION USING GROUND AND SATELLITES DATA**
*Giovanni Macelloni, Marco Brogioni, Simone Pettinato, Francesco Montomoli, IFAC-CNR, Italy; Fabiano Monti, WSL Institute for Snow and Avalanche Research SLF, Switzerland; Tania Casal, European Space Agency / ESTEC, Netherlands*

**TH3.112.2** 13:50 **UNDERSTANDING L-BAND DATA ACQUIRED BY SMOS OVER ANTARCTICA USING IN SITU PROPERTY MEASUREMENTS AND RADIATIVE TRANSFER MODELING**
*Marion Leduc-Leballeur, Ghislain Picard, LGGE, France; Arnaud Mialon, Centre d'Études Spatiales de la BIOsphère, France; Eric Lefebvre, LGGE, France; Christoph Rüdiger, Department of Civil Engineering, Australia; Yann H. Kerr, Centre d'Études Spatiales de la BIOsphère, France; Florent Dupont, LGGE, CARTEL, France; Laurent Arnaud, Michel Fily, LGGE, France*

**TH3.112.3** 14:10 **ANALYSIS OF MULTI-ANGULAR BRIGHTNESS TEMPERATURE OBSERVATIONS FOR MASSIVE ICEBERGS DERIVED FROM SMOS DATA**
*Ewa Slominska, Wojciech Marczewski, Jan Slominski, Space Research Center, Polish Academy of Sciences, Poland*

**TH3.112.4** 14:30 **SOIL FROST DETECTION ALGORITHM FOR SMOS**
*Kimmo Rautiainen, Jouni Pulliainen, Juha Lemmetyinen, Anna Kontu, Cecile B. Menard, Jaakko Ikonen, Finnish Meteorological Institute, Finland; Mike Schwank, Christian Mätzler, Andreas Wiesmann, Gamma Remote Sensing Research and Consulting AG, Switzerland; Kari Luojus, Matias Takala, Finnish Meteorological Institute, Finland*

Thursday, July 25 | 15:40 - 17:20 | Room 112
Session TH4.112 | Oral-Invited

## SMOS New Application and Basic Research Results IV

Session Chair: Christoph Rudiger, Monash University

**TH4.112.1** 15:40 **USING SMOS OBSERVATIONS FOR SCIENCE DEVELOPMENT OF THE SMAP LEVEL 4 SURFACE AND ROOT ZONE SOIL MOISTURE ALGORITHM**
*Rolf Reichle, Gabrielle De Lannoy, NASA Goddard Space Flight Center, United States; Wade Crow, USDA ARS, United States; John Kimball, University of Montana, United States; Randal Koster, Qing Liu, Clara Draper, NASA Goddard Space Flight Center, United States*

**TH4.112.2** 16:00 **THE IMPACT OF ASSIMILATING SMOS BRIGHTNESS TEMPERATURES WITHIN THE CANADIAN LAND DATA ASSIMILATION SYSTEM**
*Marco Carrera, Stephane Belair, Sarah Dyck, Bernard Bilodeau, Nathalie Gauthier, Environment Canada, Canada*

**TH4.112.3** 16:20 **A PARTICLE SMOOTHER WITH SEQUENTIAL IMPORTANCE RESAMPLING FOR RADIATIVE TRANSFER PARAMETER ESTIMATION**
*Carsten Montzka, Research Centre Jülich, Germany; Jennifer Grant, Lund University, Sweden; Harrie-Jan Hendricks-Franssen, Forschungszentrum Juelich, Germany; Matthias Drusch, European Space Agency / ESTEC, Netherlands; Harry Vereecken, Research Centre Jülich, Germany*

**TH4.112.4** 16:40 **SIMULATION OF SMOS BRIGHTNESS TERMPERATURES OVER THE UPPER MISSISSIPPI (USA) AND MURRAY DARLING (AUSTRALIA) BASINS**
*Hans Lievens, Ghent University, Belgium; Valentijn Pauwels, Monash University, Australia; Ahmad Al Bitar, François Cabot, Centre d'Études Spatiales de la BIOsphère, France; Gabrielle De Lannoy, NASA Goddard Space Flight Center, United States; Gift Dumedah, Monash University, Australia; Yann H. Kerr, Centre d'Études Spatiales de la BIOsphère, France; Ming Pan, Princeton University, United States; Jeffrey P. Walker, Monash University, Australia; Eric Wood, Princeton University, United States; Niko Verhoest, Ghent University, Belgium*

**TH4.112.5** 17:00 **NOISE REMOVAL ON OCEAN SCALARS BY MEANS OF SINGULARITY-BASED FUSION**
*Antonio Turiel, Marta Umbert, Nina Hoareau, Justino Martínez, Estrella Olmedo, Joaquim Ballabrera-Poy, Marcos Portabella, Jordi Font, Institut de Ciències del Mar CSIC, Spain; María Piles Guillem, Universitat Politècnica de Catalunya (UPC), Spain*

Thursday, July 25 | 08:20 - 10:00 | Room 207
Session TH1.207 | Oral-Invited

### Change Detection and Multi-temporal Image Analysis I

Session Co-Chairs: Lorenzo Bruzzone, University of Trento; Waldo Kleynhans, Remote Sensing Research Unit - Meraka - CSIR

**TH1.207.1** 08:20 **A MULTISCALE CONTEXTUAL APPROACH TO CHANGE DETECTION IN MULTISENSOR VHR REMOTE SENSING IMAGES**
*Gabriele Moser, Michaela De Martino, Sebastiano Serpico, University of Genoa, Italy*

**TH1.207.2** 08:40 **SAR IMAGE CHANGE DETECTION BY LIKELIHOOD RATIO TEST IN MULTI-TEMPORAL TIME SERIES**
*Xin Su, Telecom ParisTech, France; Charles-Alban Deledalle, Université Bordeaux 1, France; Florence Tupin, Telecom ParisTech, France; Hong Sun, Wuhan University, China*

**TH1.207.3** 09:00 **DETECTION OF CHANGED BUILDINGS IN MULTITEMPORAL VERY HIGH RESOLUTION SAR IMAGES**
*Carlo Marin, Francesca Bovolo, Lorenzo Bruzzone, University of Trento, Italy*

**TH1.207.4** 09:20 **DETECTING LAND-COVER MODIFICATIONS FROM MULTI-RESOLUTION SATELLITE IMAGE TIME SERIES**
*Francois Petitjean, Monash University, Australia; Jordi Inglada, CNES, Centre d'Etudes Spatiales de la Biosphère, France; Pierre Gancarski, LSIIT/University of Strasbourg, France*

**TH1.207.5** 09:40 **A KERNEL VERSION OF MULTIVARIATE ALTERATION DETECTION**
*Allan A. Nielsen, Jacob S. Vestergaard, Technical University of Denmark, Denmark*

Thursday, July 25 | 10:30 - 12:10 | Room 207
Session TH2.207 | Oral-Invited

### Change Detection and Multi-temporal Image Analysis II

Session Co-Chairs: Francesca Bovolo, University of Trento; Hichem Sahbi, Telecom ParisTech

**TH2.207.1** 10:30 **A COMPARISON OF SVM-BASED CASCADE MULTITEMPORAL CLASSIFIERS**
*Raul Feitosa, Ligia Tarazona, Gilson da Costa, Pontifical Catholic University of Rio de Janeiro, Brazil*

**TH2.207.2** 10:50 **A SPATIO-TEMPORAL AUTOCORRELATION CHANGE DETECTION APPROACH USING HYPER-TEMPORAL SATELLITE DATA**
*Waldo Kleynhans, Brian Salmon, Konrad Wessels, Council for Scientific and Industrial Research, South Africa; Jc Olivier, University of Tasmania, Australia*

**TH2.207.3** 11:10 **NON-LINEAR TIME SAMPLING DRIVEN BY SURFACE TEMPERATURE FOR THE MONITORING OF VEGETATED AREAS USING MULTI- AND HYPER-TEMPORAL SATELLITE IMAGE TIME SERIES**
*Isabel Rodes, Jordi Inglada, Olivier Hagolle, Jean-François Dejoux, Gérard Dedieu, Centre d'Études Spatiales de la BIOsphère, France*

**TH2.207.4** 11:30 **A 4-DIMENSIONAL APPROACH TO IMAGE TIME SERIES VISUALIZATION AND ANALYSIS**
*Francesca Bovolo, Lorenzo Bruzzone, University of Trento, Italy*

**TH2.207.5** 11:50 **INTERACTIVE SATELLITE IMAGE CHANGE DETECTION**
*Hichem Sahbi, CNRS TELECOM ParisTech, France*

Thursday, July 25 | 13:30 - 15:10 | Room 207
Session TH3.207 | Oral-Invited

### Next Generation Radar Instruments and Technologies for Future Missions and Mission Concepts I

Session Chair: Paco Lopez-Dekker, German Aerospace Center (DLR)

**TH3.207.1** 13:30 **DIGITAL BEAM FORMING FRONTEND DEMONSTRATOR FOR SENTINEL-1 FOLLOW-ON MISSION**
*Christoph Schaefer, Friedhelm Rostan, Christoph Heer, Grzegorz Adamiuk, Astrium GmbH, Germany; Martin Suess, Michael Ludwig, European Space Agency / ESTEC, Netherlands*

**TH3.207.2** 13:50 **INSTRUMENT ARCHITECTURE, ADVANCED DIGITAL BEAMFORMING TECHNIQUES, AND OPERATION MODES FOR AN ENHANCED SIGNAL MISSION CONCEPT**
*Paco Lopez-Dekker, Marwan Younis, Sebastian Bertl, Gerhard Krieger, German Aerospace Center (DLR), Germany*

**TH3.207.3** 14:10 **KA-BAND SAR FOR SEA ICE MONITORING**
*Wolfgang Dierking, Alfred-Wegener-Institute for Polar and Marine Research, Germany*

**TH3.207.4** 14:30 **COREH2O: HIGH-RESOLUTION X/KU-BAND RADAR IMAGING OF COLD LAND PROCESSES**
*Helmut Rott, University of Innsbruck, Austria; Donald Cline, National Oceanic and Atmospheric Administration / NWS, United States; Claude Duguay, University of Waterloo, Canada; Richard Essery, University of Edinburgh, United Kingdom; Pierre Etchevers, Météo-France, France; Irena Hajnsek, German Aerospace Center (DLR), Germany; Michael Kern, European Space Agency, Netherlands; Giovanni Macelloni, IFAC-CNR, Institute of Applied Physics, Italy; Eirik Malnes, Norut IT, Norway; Jouni Pulliainen, Finnish Meteorological Institute, Finland; Simon Yueh, California Institute of Technology, United States*

**TH3.207.5** 14:50 **ORBITING ARID SUBSURFACE AND ICE SHEET SOUNDER (OASIS): EXPLORING DESERT AQUIFERS AND POLAR ICE SHEETS AND THEIR ROLE IN CURRENT AND PALEO-CLIMATE EVOLUTION**
*Essam Heggy, Paul Rosen, Richard Beatty, Tony Freeman, Yonggyu Gim, Jet Propulsion Laboratory, United States*

**Instrumentation and Future Technologies TC Meeting to follow at 17:30.**

Thursday, July 25 | 15:40 - 17:20 | Room 207
Session TH4.207 | Oral-Invited

### Super-pixel Based Image Processing and Classification

Session Co-Chairs: Xiuping Jia, University of New South Wales; Bing Zhang, Center for Earth Observation & Digital Earth, Chinese Academy of Sciences (CEODE)

**TH4.207.1** 15:40 **INVESTIGATING SPATIAL AND TEMPORAL DYNAMICS OF THE LEEUWIN CURRENT FROM MODIS SEA SURFACE TEMPERATURE IMAGES USING OBJECT-BASED TECHNIQUES**
*Zhi Huang, Geoscience Australia, Australia*

**TH4.207.2** 16:00 **LARGE SCALE HYPERSPECTRAL DATA SEGMENTATION BY RANDOM SPATIAL SUBSPACE CLUSTERING**
*Yi Guo, The Commonwealth Scientific and Industrial Research Organisation, Australia; Junbin Gao, Charles Sturt University, Australia; Feng Li, Chinese Academy of Sciences, China*

**TH4.207.3** 16:20 **SUPERPIXEL-BASED MARKOV RANDOM FIELD FOR CLASSIFICATION OF HYPERSPECTRAL IMAGES**
*Shanshan Li, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China; Xiuping Jia, University of New South Wales, Australia Defense Force Academy, Australia; Bing Zhang, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

**TH4.207.4** 16:40 **A GRAPH-CUT-BASED METHOD FOR SPATIO-TEMPORAL SEGMENTATION OF FIRE FROM SATELLITE OBSERVATIONS**
*Yuliya Tarabalka, Guillaume Charpiat, INRIA Sophia-Antipolis Méditerranée, France*

**TH4.207.5** 17:00 **HYPERSPECTRAL IMAGE RECONSTRUCTION BASED SUPER-PIXEL MAPPING USING CROSS-CHANNEL SPARSE MODEL**
*Jie Li, Chao Zeng, Qiangqiang Yuan, Liangpei Zhang, Huanfeng Shen, Wuhan University, China*

Thursday, July 25 | 08:20 - 10:00 | Room 208
Session TH1.208 | Oral-Invited

## Spaceborne Imaging Spectroscopy Missions - Current and Future Activities I

**TH1.208.1** 08:20 **OVERVIEW OF TERRESTRIAL IMAGING SPECTROSCOPY MISSIONS**
*Karl Staenz, University of Lethbridge, Canada; Andreas Mueller, Uta Heiden, German Aerospace Center (DLR), Germany*

**TH1.208.2** 08:40 **ESA'S HYPERSPECTRAL MISSIONS**
*Jean-Loup Bézy, Grégory Bazalgette Courèges-Lacoste, Joerg Callies, Umberto Del Bello, Matthias Drusch, Paul Ingmann, Stefan Kraft, Daniel Lamarre, Armin Loescher, Luca Maresi, Kevin McMullan, Yasjka Meijer, Roland Meynart, Jens Nieke, Bernd Sierk, Hendrik Stark, Ben Veihelmann, European Space Agency / ESTEC, Netherlands; Michael Berger, Michael Rast, European Space Agency / ESRIN, Italy*

**TH1.208.3** 09:00 **THE PRISMA HYPERSPECTRAL MISSION: SCIENCE ACTIVITIES AND OPPORTUNITIES FOR AGRICULTURE AND LAND MONITORING**
*Stefano Pignatti, IMAA-CNR, Italy; Nicola Acito, Accademia Navale, Università di Pisa, Italy; Umberto Amato, IAC-CNR, Italy; Raffaele Casa, Università della Tuscia, Italy; De Bonis Roberto, Università di Roma, Italy; Marco Diani, Università di Pisa, Italy; Giovanni Laneve, Università di Roma, Italy; Stefania Matteoli, Università di Pisa, Italy; Angelo Palombo, Simone Pascucci, Filomena Romano, Federico Santini, Tiziana Simoniello, IMAA-CNR, Italy; Cristina Ananasso, Italian Space Agency (ASI), Italy; Giovanni Corsini, Università di Pisa, Italy; Vincenzo Cuomo, IMAA-CNR, Italy*

**TH1.208.4** 09:20 **THE FRENCH EARTH OBSERVATION SCIENCE/DEFENCE MISSION HYPXIM – A SECOND GENERATION HIGH SPECTRAL AND SPATIAL RESOLUTION IMAGING SPECTROMETER**
*Véronique Carrere, Université de Nantes, France; Anne Bourguignon, BRGM, France; Xavier Briottet, ONERA, France; Malik Chami, Université Pierre et Marie Curie, France; Stéphane Chevrel, BRGM, France; Stéphane Jacquemoud, IPG Paris, France; Rodolphe Marion, CEA, France*

**TH1.208.5** 09:40 **DEVELOPMENT OF CANADIAN HYPERSPECTRAL IMAGER ONBOARD MICRO-SATELLITES**
*Shen-En Qian, Ralph Girard, Guennadi Kroupnik, Canadian Space Agency, Canada*

Thursday, July 25 | 10:30 - 12:10 | Room 208
Session TH2.208 | Oral-Invited

## Spaceborne Imaging Spectroscopy Missions - Activities & Calibration

**TH2.208.1** 10:30 **THE ENVIRONMENTAL MAPPING AND ANALYSIS PROGRAM (ENMAP) - PRESENT STATUS OF PREPARATORY PHASE**
*Hermann Kaufmann, Karl Segl, Theres Kuester, Christian Rogass, Saskia Foerster, Hendrik Wulf, Helmholtz Centre Potsdam, German Research Centre for Geosciences GFZ, Germany; Stefan Hofer, Bernhard Sang, Kayser-Threde GmbH, Germany; Tobias Storch, Andreas Mueller, German Aerospace Center (DLR) German Remote Sensing Data Center (DFD), Germany; Godela Rossner, Christian Chlebek, German Aerospace Center (DLR), Germany*

**TH2.208.2** 10:50 **CURRENT STATUS OF HYPERSPECTRAL IMAGER SUITE (HISUI)**
*Tsuneo Matsunaga, National Institute for Environmental Studies, Japan; Akira Iwasaki, The University of Tokyo, Japan; Satoshi Tsuchida, National Institute of Advanced Industrial Science and Technology, Japan; Jun Tanii, Osamu Kashimura, Japan Space Systems, Japan; Ryosuke Nakamura, Hirokazu Yamamoto, National Institute of Advanced Industrial Science and Technology, Japan; Tetsushi Tachikawa, Japan Space Systems, Japan; Shuichi Rokugawa, The University of Tokyo, Japan*

**TH2.208.3** 11:10 **SHALOM: SPACEBORNE HYPERSPECTRAL APPLICATIVE LAND AND OCEAN MISSION: A JOINT PROJECT OF ASI-ISA**
*Eyal Bend Dor, Tel Aviv University, Israel; Avia Kafri, Israel Space Agency, Israel; Giancarlo Varacalli, Italian Space Agency, Italy*

**TH2.208.4** 11:30 **A STUDY ON VICARIOUS CALIBRATION AND CROSS CALIBRATION FOR HISUI HYPERSPECTRAL AND MULTISPECTRAL IMAGER**
*Hirokazu Yamamoto, Satoshi Tsuchida, GSJ, Japan*

**TH2.208.5** 11:50 **RADIOMETRIC ABSOLUTE ACCURACY IMPROVEMENTS FOR IMAGING SPECTROMETRY WITH HYSICS**
*Greg Kopp, Peter Pilewskie, Chris Belting, Zach Castleman, Ginger Drake, Joey Espejo, Karl Heuerman, Bret Lamprecht, Paul Smith, Bill Vermeer, University of Colorado, United States*

Thursday, July 25 | 13:30 - 15:10 | Room 208
Session TH3.208 | Oral-Invited

## New Developments in Monitoring of Ocean Surface Features with Spacebourne SAR

**TH3.208.1** 13:30 **TROPICAL CYCLONE VECTOR WINDS FORM C-BAND DUAL-POLARIZATION SYNTHETIC APERTURE RADAR**
*Biao Zhang, Nanjing University of Information Science & Technology, China; William Perrie, Bedford Institute of Oceanography, Canada; Yijun He, Zhongfeng Qiu, Nanjing University of Information Science & Technology, China; Jie Guo, Yantai Institute of Coastal Zone Research, Chinese Academy of Sciences, China*

**TH3.208.2** 13:50 **DETECTION OF OIL SPILLS WITH THE SECOND STOKES PARAMETER OF THE HYBIRD POLARIMETRIC SAR**
*HaiYan Li, Key Laboratory of Computational Geodynamics, Chinese Academy of Sciences/Earth Science College, University of Chinese Academy of Sciences; Fisheries and Oceans Canada, Bedford Institute of Oceanography, China; William Perrie, Fisheries and Oceans Canada, Bedford Institute of Oceanography, Canada*

**TH3.208.3** 14:10 **HURRICANE WIND MONITORING BY CROSS DUAL-POL SAR**
*Hui Shen, Chinese Academy of Sciences, China; William Perrie, Bedford Institute of Oceanography, Canada; Peifang Guo, Ocean University of China, China*

**TH3.208.4** 14:30 **SAR OBSERVATIONS OF INTERNAL SOLITARY WAVE REFRACTION AT DONGSHA ATOLL, SOUTH CHINA SEA**
*Xiaofeng Li, National Oceanic and Atmospheric Administration / SHOU, United States; Christopher Jackson, William Pichel, National Oceanic and Atmospheric Administration, United States*

**TH3.208.5** 14:50 **COMPARISON OF CURRENT FIELDS FROM TERRASAR-X AND TANDEM-X ALONG-TRACK INTERFEROMETRY AND DOPPLER CENTROID ANALYSIS**
*Roland Romeiser, University of Miami, United States; Hartmut Runge, Steffen Suchandt, Ralph Kahle, Cristian Rossi, German Aerospace Center (DLR), Germany; Paul Bell, National Oceanography Centre, United Kingdom*

Thursday, July 25 | 15:40 - 17:20 | Room 208
Session TH4.208 | Oral

## Subsurface Sensing I

Session Co-Chairs: Keith Morrison, Cranfield University; Liping Di, George Mason University

**TH4.208.1** 15:40 **SUBSAR – A SCHEME FOR SEPARATING SURFACE AND SUB-SURFACE FEATURES IN SAR IMAGERY**
*Keith Morrison, Cranfield University, United Kingdom; John Bennett, Sheffield University, United Kingdom; Matt Nolan, University of Alaska Fairbanks, United States*

**TH4.208.2** 16:00 **AUTOMATIC CLASSIFICATION OF SUBSURFACE FEATURES IN RADAR SOUNDER DATA ACQUIRED IN ICY AREAS**
*Ana-Maria Ilisei, Lorenzo Bruzzone, University of Trento, Italy*

**TH4.208.3** 16:20 **APPLICATION OF FREEMAN DECOMPOSITION TO FULL POLARIMETRIC GPR**
*Xuan Feng, Yue Yu, Qi Lu, Cai Liu, Jilin University, China; Jianguo Zhao, China University of Petroleum, China; Yan Zhang, CongMei Xie, WenJing Liang, Delihai Enhe, Ning Hu, HongLi Li, Qianci Ren, Jilin University, China*

**TH4.208.4** 16:40 **A SIMPLE AND ACCURATE MEANS OF PREDICTING THE LOCUS OF CONSTANT TRAVEL TIME OF AN UNDERGROUND SCATTERER FOR AIR-LAUNCHED BISTATIC GPR**
*Carey Rappaport, Ann Morgenthaler, Northeastern University, United States*

**TH4.208.5** 17:00 **RADIO-WAVE DETECTION AND ESTIMATION OF SUB-SURFACE HYDRAULIC FRACTURES AT MF BAND**
*Jiangfeng Wu, Kamal Sarabandi, The University of Michigan, United States*

## Remote Sensing from Unmanned Aerial Vehicles and Systems

Session Co-Chairs: Delwyn Moller, Remote Sensing Solutions; Darren Turner, University of Tasmania

**FR3.101.1** 13:30 **THE GLACIER AND ICE SURFACE TOPOGRAPHY INTERFEROMETER AIRBORNE CRYOSPHERIC MAPPING SENSOR**
*Delwyn Moller, Remote Sensing Solutions, United States; Scott Hensley, Xiaoqing Wu, Gregory Sadowy, Jet Propulsion Laboratory / California Institute of Technology, United States; James Carswell, Remote Sensing Solutions, United States; Charles Fisher, Lance Milligan, Mauricio Sanchez-Barbetty, Yunling Lou, Jet Propulsion Laboratory / California Institute of Technology, United States*

**FR3.101.2** 13:50 **USING A MICRO UNMANNED AERIAL VEHICLE (UAV) FOR ULTRA HIGH RESOLUTION MAPPING AND MONITORING OF LANDSLIDE DYNAMICS**
*Darren Turner, Arko Lucieer, University of Tasmania, Australia*

**FR3.101.3** 14:10 **AN UNMANNED AIRCRAFT SYSTEM (UAS) WITH A HYPERSPECTRAL SENSOR FOR MAPPING MOSS BED HEALTH IN ANTARCTICA**
*Arko Lucieer, Darren Turner, University of Tasmania, Australia*

**FR3.101.4** 14:30 **ASSESSING THE STABILITY OF CANOPY MAPS PRODUCED FROM UAV-LIDAR DATA**
*Luke Wallace, University of Tasmania, Australia*

**FR3.101.5** 14:50 **AN ADAPTIVE TEXTURE SELECTION FRAMEWORK FOR ULTRA-HIGH RESOLUTION UAV IMAGERY**
*Joshua Kelcey, Arko Lucieer, University of Tasmania, Australia*





## Ground-based Sensor Systems

Session Chair: Keith Morrison, Cranfield University

**FR4.101.1** 15:40 **REDUCTION OF SEISMIC SIGNAL RANDOM NOISE BASED ON GREY FILTER**
*Qian Wang, Zhongyu Wang, Jihua Fu, Beihang University, China*

**FR4.101.2** 16:00 **COHERENT SCATTERER SELECTION BASED ON COHERENCE OF INTERLEAVED SUB-IMAGES FOR ATMOSPHERIC CORRECTION OF GROUND-BASED SYNTHETIC APERTURE RADAR INTERFEROMETRY**
*Kazunori Takahashi, Masayoshi Matsumoto, Motoyuki Sato, Tohoku University, Japan*

**FR4.101.3** 16:20 **FOCUSING ALGORITHMS ANALYSIS FOR GROUND-BASED SAR IMAGES**
*Pietro Guccione, Mariantonietta Zonno, Luigi Mascolo, Politecnico di Bari, Italy; Giovanni Nico, Consiglio Nazionale delle Ricerche, Italy*

**FR4.101.4** 16:40 **LANDSLIDE MONITORING SYSTEM BASED ON SPREAD-SPECTRUM CONTINUOUS WAVE RADAR**
*Tao Wang, Hong Zhang, Lisheng Yang, Chongqing University, China; Andrew G Dempster, University of New South Wales, Austria; Kangnan Li, Qiu Wu, Chongqing University, China*

**FR4.101.5** 17:00 **ESTIMATION OF SIGNIFICANT WAVE HEIGHT USING REFLECTED DIGITAL COMMUNICATION SIGNALS**
*Rashmi Shah, James Garrison, Purdue University, United States*

Friday, July 26 | 08:20 - 10:00 | Room 102
Session FR1.102 | Oral

## Subsurface Sensing II

Session Co-Chairs: Liping Di, George Mason University; Keith Morrison, Cranfield University

**FR1.102.1** 08:20 **EFFICIENT DRIVE SIGNALS FOR BROADBAND CW ELECTROMAGNETIC INDUCTION SENSORS**
*Waymond Scott, Georgia Institute of Technology, United States*

**FR1.102.2** 08:40 **RIME: RADAR FOR ICY MOON EXPLORATION**
*Lorenzo Bruzzone, University of Trento, Italy; Jeffrey J. Plaut, Jet Propulsion Laboratory / California Institute of Technology, United States; Gianni Alberti, C.O.R.I.S.T.A., Italy; Donald D. Blankenship, University of Texas at Austin, United States; Francesca Bovolo, University of Trento, Italy; Bruce A. Campbell, Smithsonian Institution, United States; Adamo Ferro, University of Trento, Italy; Yonggyu Gim, Jet Propulsion Laboratory / California Institute of Technology, United States; Wlodek Kofman, Institut de Planetologie ed d'Astrophysique de Grenoble IPAG CNRS/UJF,, France; Goro Komatsu, Institute Research School of Planetary Sciences, Università d'Annunzio, Italy; William McKinnon, Washington University in St. Louis, United States; Giuseppe Mitri, Roberto Orosei, INAF/IFSI, Italy; G. Wesley Patterson, The Johns Hopkins University Applied Physics Laboratory, United States; Dirk Plettemeier, Technische Universität Dresden, Germany; Roberto Seu, University of Rome La Sapienza, Italy*

**FR1.102.3** 09:00 **A METHOD ON COALBED METHANE GAS CONTENT MONITORING BASED ON SUPER-LOW FREQUENCY ELECTROMAGNETIC TECHNOLOGY**
*Yanbing Bai, Qiming Qin, Li Chen, Nan Wang, Jianhua Wang, Peking University, China; Hongbo Jiang, China Seismological Bureau, China*

**FR1.102.4** 09:20 **ORBITING ARID SUBSURFACE AND ICE SHEET SOUNDER (OASIS)**
*Essam Heggy, Paul Rosen, Anthony Freeman, Jet Propulsion Laboratory, United States*

**FR1.102.5** 09:40 **EBG ANTENNA FOR GPR CO-LOCATED WITH A METAL DETECTOR FOR LANDMINE DETECTION**
*Ian McMichael, US Army CERDEC RDECOM NVESD, United States; Waymond Scott, Georgia Institute of Technology, United States; Eric Nallon, Vincent Schnee, US Army CERDEC RDECOM NVESD, United States; Mark Mirotznik, University of Delaware, United States*

Friday, July 26 | 13:30 - 15:10 | Room 102
Session FR3.102 | Oral

## Forest Degradation II

Session Chair: Mark Williams, Horizon Geoscience Consulting

**FR3.102.1** 13:30 **REFOCUSING REMOTE SENSING TOWARDS THE RESTORATION OF GLOBAL ECOSYSTEMS**
*Richard Lucas, Aberystwyth University, United Kingdom; Daniel Clewley, University of Southern California, United States; Peter Bunting, Aberystwyth University, United Kingdom*

**FR3.102.2** 13:50 **DEPENDENCY OF FOREST BIOMASS ON FULL POLARIMETRIC PARAMETERS OBTAINED FROM L-BAND SAR DATA FOR A NATURAL FOREST IN INDONESIA**
*Manabu Watanabe, Takeshi Motooka, Tomohiro Shiraishi, Rajesh Thapa, Noriyuki Kawano, Masanobu Shimada, Japan Aerospace Exploration Agency, Japan*

**FR3.102.3** 14:10 **MULTI-SCALE ANALYSIS OF VEGETATION DYNAMICS FROM SATELLITE IMAGES**
*Yang-Sheng Chiang, Kun-Shan Chen, National Central University, Taiwan*

**FR3.102.4** 14:30 **ANTHROPOGENIC AND CLIMATIC INFLUENCES ON BIOMASS BURNING IN INSULAR SOUTHEAST ASIA**
*Soo Chin Liew, National University of Singapore, Singapore*

**FR3.102.5** 14:50 **INDONESIA'S NATIONAL CARBON ACCOUNTING REMOTE SENSING PROGRAM - A NATIONAL SYSTEM FOR MONITORING FOREST CHANGES**
*Orbita Roswintiarti, Pak Kustiyo, Arum Tjahyaningsih, LAPAN, Indonesia; Suzanne Furby, Jeremy Wallace, Commonwealth Scientific and Industrial Research Organisation, Indonesia*

Friday, July 26 | 15:40 - 17:20 | Room 102
Session FR4.102 | Oral

## Impact of Remote Sensing Programs II

Session Chair: David Kunkee, The Aerospace Corporation

**FR4.102.1** 15:40 **A COLLABORATIVE FRAMEWORK FOR VEGETATED SYSTEMS RESEARCH: A PERSPECTIVE FROM VICTORIA, AUSTRALIA**
*Mariela Soto-Berelov, Simon Jones, RMIT University, Australia; Andrew Mellor, Department of Environment and Primary Industries, Australia; Darius Culvenor, Environmental Sensing Systems, Australia; Andrew Haywood, Department of Environment and Primary Industries, Australia; Lola Suarez, Phillip Wilkes, William Woodgate, RMIT University, Australia; Glenn Newnham, Commonwealth Scientific and Industrial Research Organisation, Australia*

**FR4.102.2** 16:00 **ENVIRONMENTAL CONTROLS ON SALTCEDAR (TAMARIX SPP.) TRANSPIRATION AND STOMATAL CONDUCTANCE AND IMPLICATIONS FOR DETERMINING EVAPOTRANSPIRATION OF SALTCEDAR STANDS BY REMOTE SENSING**
*Pamela Nagler, US Geological Survey, Southwest Biological Science Center, Sonoran Desert Research Station, United States; Edward Glenn, University of Arizona, Soil, Water, Environmental Science Department, United States; Kevin Hultine, Desert Botanical Gardens, United States; Kiyomi Morino, University of Arizona, Tree Ring Lab, United States*

**FR4.102.3** 16:20 **EVALUATE REMOTE SENSING SYSTEM QUALITY BY SIMULATING IMAGING PROCESS AND ANALYZING DEGRADED IMAGE**
*Xiliang Tong, Xiaomei Chen, Ye Cheng, Bingjing Mao, Guoqiang Ni, Beijing Institute of Technology, China*

**FR4.102.4** 16:40 **REMOTE SENSING AND CROWD-SOURCING**
*Raffaella Guida, Peter T.B. Brett, Salman Saeed Khan, University of Surrey, United Kingdom*

**FR4.102.5** 17:00 **FUSION OF GIS AND REMOTE SENSING DATA FOR GEOLOCATION OF PHOTOGRAPHS**
*Krzysztof Koperski, Carsten Tusk, Kathleen Johnson, Giovanni Marchisio, DigitalGlobe Inc., United States*

Friday, July 26 | 08:20 - 10:00 | Room 103
Session FR1.103 | Oral

### Information Extraction for Change Detection

Session Co-Chairs: Francesca Bovolo, University of Trento; Antonio Iodice, Università di Napoli

**FR1.103.1** 08:20 **SEQUENTIAL CASCADE CLASSIFICATION OF IMAGE TIME SERIES BY EXPLOITING MULTIPLE PAIRWISE CHANGE DETECTION**
*Begum Demir, Francesca Bovolo, Lorenzo Bruzzone, University of Trento, Italy*

**FR1.103.2** 08:40 **EFFECTS OF DESPECKLING ON THE ESTIMATION OF FRACTAL DIMENSION FROM SAR IMAGES**
*Gerardo Di Martino, Giovanni Poggi, Daniele Riccio, Luisa Verdoliva, University of Naples Federico II, Italy*

**FR1.103.3** 09:00 **TIME SERIES OF SAR IMAGE FRACTAL MAPS**
*Ivana Zinno, Claudio De Luca, IREA-CNR, Italy; Gerardo Di Martino, Antonio Iodice, Università degli Studi di Napoli, Federico II, Italy; Mariarosaria Manzo, Antonio Pepe, Susi Pepe, IREA-CNR, Italy; Daniele Riccio, Giuseppe Ruello, Università degli Studi di Napoli, Federico II, Italy; Eugenio Sansosti, Pietro Tizzani, IREA-CNR, Italy*

**FR1.103.4** 09:20 **UNSUPERVISED CLASSIFICATION OF SEA-ICE USING SYNTHETIC APERTURE RADAR VIA AN ADAPTIVE TEXTURE SPARSIFYING TRANSFORM**
*Robert Amelard, Alexander Wong, Fan Li, David Clausi, University of Waterloo, Canada*

**FR1.103.5** 09:40 **MONITORING SYSTEM OF PHYTOPLANKTON BLOOMS BY USING UNSUPERVISED CLASSIFIER AND TIME MODELING**
*Kevin Rousseeuw, Emilie Caillault, Université du Littoral Cote d'Opale, France; Alain Lefebvre, IFREMER, France; Denis Hamad, Université du Littoral Cote d'Opale, France*

Friday, July 26 | 10:30 - 12:10 | Room 103
Session FR2.103 | Oral

### 3D Information Extraction in Urban Data Sets

Session Chair: Peijun Li, Peking University

**FR2.103.1** 10:30 **HOUGH FOREST FOR OBJECT DETECTION IN LASER SCANNING POINT CLOUDS**
*Hanyun Wang, National University of Defense Technology, China; Cheng Wang, Huan Luo, Xiamen University, China; Peng Li, National University of Defense Technology, China; Zhuo Sun, Yongtao Yu, Chenglu Wen, Jonathan Li, Xiamen University, China*

**FR2.103.2** 10:50 **AUTOMATIC AND THRESHOLD-FREE EVALUATION OF 3D BUILDING ROOF RECONSTRUCTION TECHNIQUES**
*Mohammad Awrangjeb, Monash University, Australia; Clive Fraser, University of Melbourne, Australia*

**FR2.103.3** 11:10 **AUTOMATIC BUILDING INFORMATION EXTRACTION BY MODIFIED VOLUMETRIC SHADOW ANALYSIS FROM HIGH RESOLUTION MULTISPECTRAL DATA**
*Taeyoon Lee, Youn-Soo Kim, Korea Aerospace Research Institute, Republic of Korea; Taejung Kim, Inha University, Republic of Korea*

**FR2.103.4** 11:30 **USING RANDOM FOREST TO INTEGRATE LIDAR DATA AND HYPERSPECTRAL IMAGERY FOR LAND COVER CLASSIFICATION**
*Rui Huang, Jiangtao Zhu, Shanghai University, China*

**FR2.103.5** 11:50 **OBJECT RECOGNITION IN LASER SCANNING POINT CLOUDS BASED ON FAST LINEAR SUPPORT VECTOR MACHINE**
*Huan Luo, Cheng Wang, Xiamen University, China; Hanyun Wang, School of Electronic Science and Engineering, National University of Defense Technology, China; Zhuo Sun, School of Information Science and Technology, Xiamen University, China; Zhipeng Cai, Chenglu Wen, Jonathan Li, Xiamen University, China*

Friday, July 26 | 13:30 - 15:10 | Room 103
Session FR3.103 | Oral

### 2D Information Extraction in Urban Data Sets

**FR3.103.1** 13:30 **INCORPORATING SPATIAL PROPERTIES IN SUBSPACE DETECTION**
*Md Ali Hossain, Xiuping Jia, Mark Pickering, University of New South Wales, Australia*

**FR3.103.2** 13:50 **URBAN CHANGE DETECTION IN SAR IMAGES BY INTERACTIVE LEARNING**
*Bertrand Le Saux, Hicham Randrianarivo, ONERA - French Aerospace Laboratory, France*

**FR3.103.3** 14:10 **A DEM-BASED MODIFIED PIXEL SWAPPING ALGORITHM FOR FLOODPLAIN INUNDATION MAPPING AT SUBPIXEL SCALE**
*Chang Huang, East China Normal University, Australia; Yun Chen, Commonwealth Scientific and Industrial Research Organisation, Australia; Jianping Wu, East China Normal University, China*

**FR3.103.4** 14:30 **A NOVEL MODEL FOR BUILDING INFORMATION ACQUISITION OPTIMIZATION TECHNOLOGY OF REMOTE SENSING OBSERVATION**
*Nan Su, Ye Zhang, Yiming Yan, Yanfeng Gu, Harbin Institute of Technology, China*

**FR3.103.5** 14:50 **VEHICLE DETECTION FROM PARKING LOT AERIAL IMAGES**
*Huan Wei, Guoqing Zhou, Guilin University of Technology, China; Zezhong Zheng, University of Electronic Science and Technology of China, China; Xiaowen Li, Beijing Normal University and the Institute of Remote Sensing and Digital Earth of Chinese Academy of Sciences, China; Yalan Liu, Chinese Academy of Sciences, China; Ying Zhang, University of Electronic Science and Technology of China, China; Shang Li, Tao Yue, Guilin University of Technology, China*

Friday, July 26 | 15:40 - 17:20 | Room 103
Session FR4.103 | Oral

### Information Extraction for Target Detection

Session Co-Chairs: Gerard Margarit, GMV Aerospace and Defence; Jon Mitchell, University of Texas at Arlington

**FR4.103.1** 15:40 **RADAR TARGET CHARACTERIZATION USING MODEL-BASED BICOHERENCE**
*Jon Mitchell, Saibun Tjuatja, University of Texas at Arlington, United States*

**FR4.103.2** 16:00 **WAVEFORM DESIGN FOR TARGET DETECTION BASED ON PRIORI CHARACTERISTICS**
*Jiliang Liu, Kaizhi Wang, Xingzhao Liu, Shanghai Jiao Tong University, China*

**FR4.103.3** 16:20 **FEATURE EXTRACTION OF A GENERIC SAR TARGET USING AN IMPROVED DATA MODEL**
*Qianrong Lu, Kaizhi Wang, Xingzhao Liu, Shanghai Jiao Tong University, China*

**FR4.103.4** 16:40 **DETECTION OF POWER TRANSMISSION TOWER FROM SAR IMAGE BASED ON THE FUSION METHOD OF CFAR AND EF FEATURE**
*Ping Zhang, Zhen Li, Quan Chen, Center for Earth Observation and Digital Earth, Chinese Academy of Sciences, China*

**FR4.103.5** 17:00 **COAL-BED METHANE RESERVOIR IDENTIFICATION USING THE NATURAL SOURCE SUPER-LOW FREQUENCY REMOTE SENSING**
*Nan Wang, Qiming Qin, Chao Xie, Li Chen, Yanbing Bai, Peking University, China*

Friday, July 26 | 08:20 - 10:00 | Room 104
Session FR1.104 | Oral-Invited

## High Resolution Remote Sensing for Environmental Monitoring

Session Co-Chairs: Christoph Rudiger, Monash University; Alessandra Monerris, Monash University

**FR1.104.1** 08:20 **LAND MONITORING USING GNSS-R TECHNIQUES: A REVIEW OF RECENT ADVANCES**
*Adriano Camps, Universitat Politècnica de Catalunya (UPC), Spain; Nereida Rodriguez-Alvarez, Colorado State University, United States; Enric Valencia, Giuseppe Forte, Isaac Ramos, Alberto Alonso-Arroyo, Universitat Politècnica de Catalunya (UPC), Spain; Xavier Bosch-Lluis, Colorado State University, United States*

**FR1.104.2** 08:40 **SOIL MOISTURE MEASUREMENTS AT AN INTERMEDIATE SCALE USING COSMIC-RAY NEUTRONS.**
*David Mcjannet, Aaron Hawdon, Commonwealth Scientific and Industrial Research Organisation, Australia; Marek Zreda, Trenton Franz, Bobby Chrisman, University of Arizona, United States*

**FR1.104.3** 09:00 **POTENTIAL OF SENTINEL-1 FOR HIGH-RESOLUTION SOIL MOISTURE MONITORING**
*Alexander Gruber, Wolfgang Wagner, Alena Hegyiová, Felix Greifeneder, Stefan Schlaffer, Vienna University of Technology, Austria*

**FR1.104.4** 09:20 **INTEGRATING MEDIUM AND HIGH RESOLUTION PSINSAR DATA TO MONITOR TERRAIN MOTION ALONG LARGE SCALE MANMADE LINEAR FEATURES- A CASE STUDY IN SHANGHAI**
*Daqing Ge, Yan Wang, Ling Zhang, Man Li, Xiaofang Guo, China Aero Geophysical Survey & Remote Sensing Center for Land and Resources(AGRS), China*

**FR1.104.5** 09:40 **TEXTURE BASED IMAGE RETRIEVAL AND CLASSIFICATION OF VERY HIGH RESOLUTION MARITIME PINE FOREST IMAGES**
*Olivier Regniers, Jean-Pierre Da Costa, Gilbert Grenier, Christian Germain, Lionel Bombrun, Laboratoire IMS, France*

Friday, July 26 | 10:30 - 12:10 | Room 104
Session FR2.104 | Oral

## Microwave Interaction with Soil, Vegetation & Ocean Surface

Session Chair: Albin Gasiewski, University of Colorado

**FR2.104.1** 10:30 **A NEW DIELECTRIC MODEL FOR VEGETATION IN FROZEN ENVIRONMENT – PART I: MODELING SECTION**
*Xiaokang Kou, Linna Chai, Lingmei Jiang, Shaojie Zhao, Fengmin Wu, Beijing Normal University, China*

**FR2.104.2** 10:50 **OBSERVATIONAL ANALYSIS OF SOIL MOISTURE EFFECTS ON DINSAR SIGNALS**
*Simon Zwieback, Irena Hajnsek, ETH Zürich, Switzerland; Scott Hensley, Jet Propulsion Laboratory, United States*

**FR2.104.3** 11:10 **MODELING OF THE GNSS-R SIGNAL AS A FUNCTION OF SOIL MOISTURE AND VEGETATION BIOMASS**
*Leila Guerriero, University of Rome Tor Vergata, Italy; Nazzareno Pierdicca, Sapienza University of Rome, Italy; Alejandro Egido, University of Rome Tor Vergata, Spain; Marco Caparrini, Starlab, Spain; Simonetta Paloscia, Emanuele Santi, IFAC-CNR, Italy; Nicolas Floury, European Space Agency / ESTEC, Netherlands*

**FR2.104.4** 11:30 **APPLICATION OF BISTATIC ROUGH SURFACE BOUNDARY CONDITION BASED ON NMM3D TO 1ST ORDER RADIATIVE TRANSFER SOLUTION IN MICROWAVE REMOTE SENSING OF SOIL MOISTURE AT L-BAND**
*Chenxin Su, Tienhao Liao, Leung Tsang, University of Washington, United States; Xiaolan Xu, Jet Propulsion Laboratory, United States; Shaowu Huang, University of Washington, United States*

**FR2.104.5** 11:50 **RUSSIAN SCATTEROMETER METEOR-3: A REVIEW OF THE FIRST NUMERICAL SIMULATIONS**
*Vladimir Karaev, Eugeny Meshkov, Institute of Applied Physics RAS, Russian Federation; Alexei Shlaferov, Yury Kuznetcov, Rostovskii Scientific Research Institute of Radio Communications, Russian Federation*

Friday, July 26 | 13:30 - 15:10 | Room 104
Session FR3.104 | Oral

## Microwave Interaction with Natural Media

Session Chair: Roger Lang, George Washington University

**FR3.104.1** 13:30 **RADAR BACKSCATTERING FROM SEA FOAM AND SPRAY**
*Victor Raizer, Zel Technologies, LLC, United States*

**FR3.104.2** 13:50 **A NEW SYNTHESIS CRITERION FOR FRACTAL SURFACES: THE REMOTE SENSING APPROACH**
*Daniele Riccio, Giuseppe Ruello, University of Napoli, Italy*

**FR3.104.3** 14:10 **SIMULATING GPS TO GROUND AND RADIO OCCULTATION SIGNAL PATHS USING 3-D RAY TRACING**
*Robert Norman, RMIT University, Australia; John Le Marshall, Australian Government Bureau of Meteorology, Australia; Witold Rohm, Brett Carter, Congliang Liu, Kefei Zhang, RMIT University, Australia*

**FR3.104.4** 14:30 **A MICROWAVE BACKSCATTERING MODEL FOR THE RAIN COLUMN**
*Seda Ermis, Saibun Tjuatja, University of Texas at Arlington, United States*

**FR3.104.5** 14:50 **TOMOGRAPHIC SAR DATA ANALYSIS BASED ON THREE-DIMENSIONAL MONTE CARLO SIMULATIONS OF MAXWELL'S EQUATIONS**
*Sami Bellez, Laurent Ferro-Famil, University of Rennes 1, IETR, France*

Friday, July 26 | 15:40 - 17:20 | Room 104
Session FR4.104 | Oral

## Ground Penetration and Target Detection

**FR4.104.1** 15:40 **ANALYTIC ANALYSIS OF GROUND PENETRATING RADAR WAVE SCATTERING OF REINFORCED CONCRETE BRIDGE DECKS**
*Mohammad Tajdini, Carey Rappaport, Northeastern University, United States*

**FR4.104.2** 16:00 **LOCALIZATION OF ANTI-PERSONNEL LAND MINES USING COMPUTATIONALLY MODELED DATA FOR BISTATIC GROUND-COUPLED GROUND PENETRATING RADAR**
*Margery Hines, Carey Rappaport, Northeastern University, United States*

**FR4.104.3** 16:20 **COMPOSITE SCATTERING FROM A TARGET ABOVE 1-D DISPERSIVE SOIL SURFACE**
*Juan Li, Lixin Guo, Ke Li, Xidian University, China*

**FR4.104.4** 16:40 **CHARACTERISTICS OF SINGLE, DUAL AND MULTIPLE POLARIZATION FOR STADARD SPHERICAL TARGET IN PASSIVE W-BAND RADIOMETER IMAGING**
*Won-Gyum Kim, Nam-Won Moon, Gwangju Institute of Science and Technology, Republic of Korea; Jun-Ho Choi, Agency for Defense Development, Republic of Korea; Jin-Mi Jung, Myung-Hwan Lee, Millisys Inc., Republic of Korea; Yong-Hoon Kim, GIST, Republic of Korea*

Friday, July 26 | 08:20 - 10:00 | Room 105

Session FR1.105 | Oral

## Hyperspectal Image and Signal Processing

Session Co-Chairs: Lori Bruce, Mississippi State University; Sylvia Valero, Centre d'Etudes Spatiales de la BIOsphère (CESBIO)

**FR1.105.1** 08:20 **ENSEMBLE OF CLASSIFIERS FOR REMOTE SENSED HYPERSPECTRAL LAND COVER ANALYSIS: AN APPROACH BASED ON LINEAR PROGRAMMING AND WEIGHTED LINEAR COMBINATION**
*Sandro Luiz Jailson Lopes Tinôco, Haroldo Gambini Santos, David Menotti, Universidade Federal de Ouro Preto, Brazil; Andrey Bicalho Santos, Universidade Federal de Minas Gerais, Brazil; Jefersson A. dos Santos, University of Campinas, Brazil*

**FR1.105.2** 08:40 **HYPERSPECTRAL AND MULTISPECTRAL DATA FUSION MISSION ON HYPERSPECTRAL IMAGER SUITE (HISUI)**
*Naoto Yokoya, Akira Iwasaki, The University of Tokyo, Japan*

**FR1.105.3** 09:00 **JOINTLY SPARSE FUSION OF HYPERSPECTRAL AND MULTISPECTRAL IMAGERY**
*Claas Grohnfeldt, Xiao Xiang Zhu, Richard Bamler, German Aerospace Center (DLR), Germany*

**FR1.105.4** 09:20 **GAME THEORY APPLIED TO BIG DATA ANALYTICS IN GEOSCIENCES AND REMOTE SENSING**
*Lori Bruce, Mississippi State University, United States*

**FR1.105.5** 09:40 **OBJECT RECOGNITION IN URBAN HYPERSPECTRAL IMAGES USING BINARY PARTITION TREE REPRESENTATION**
*Silvia Valero, Centre d'Études Spatiales de la BIOsphère, France; Philippe Salembier, Technical University of Catalonia (UPC), Barcelona, Catalonia, Spain, Spain; Jocelyn Chanussot, GIPSA-lab, Signal & Image Dept., Grenoble Institute of Technology, Grenoble, France*

Friday, July 26 | 10:30 - 12:10 | Room 105

Session FR2.105 | Oral

## Image Processing I

Session Co-Chairs: John Richards, Australian National University; Paolo Gamba, University of Pavia

**FR2.105.1** 10:30 **ASSESSING UNCERTAINTIES IN REMOTE SENSING-BASED FLOOD MAPPING**
*Laura Giustarini, CRP - Gabriel Lippmann, Luxembourg; Hilde Vernieuwe, Jan Verwaeren, Department of Mathematical Modelling, Statistics and Bioinformatics, Ghent University, Belgium; Renaud Hostache, Patrick Matgen, CRP - Gabriel Lippmann, Luxembourg; Niko Verhoest, Laboratory of Hydrology and Water Management, Ghent University, Belgium; Bernard De Baets, Department of Mathematical Modelling, Statistics and Bioinformatics, Ghent University, Belgium*

**FR2.105.2** 10:50 **CONTRIBUTION OF TEXTURE AND RED-EDGE BAND FOR VEGETATED AREAS DETECTION AND IDENTIFICATION**
*Arnaud Le Bris, Francois Tassin, Nesrine Chehata, IGN, France*

**FR2.105.3** 11:10 **MAPPING AGRICULTURAL CROPS USING MODIS EVI TIME SERIES DATASETS THROUGH WAVELET VARIANCE**
*Bingwen Qiu, Ming Zhong, Fuzhou University, China; Zhenghong Tang, University of Nebraska-Lincoln, United States; Chongcheng Chen, Fuzhou University, China*

**FR2.105.4** 11:30 **CONTINUOUS SEA ICE THICKNESS ESTIMATION USING A JOINT MODIS AND AMSR-E GUIDED VARIATIONAL MODEL**
*Alexander Wong, K. Andrea Scott, Edward Li, Robert Amelard, University of Waterloo, Canada*

**FR2.105.5** 11:50 **A SEMI-AUTOMATIC APPROACH FOR ESTIMATING NEAR SURFACE INTERNAL LAYERS FROM SNOW RADAR IMAGERY**
*Jerome Mitchell, David Crandall, Geoffrey Fox, Indiana University, United States; John Paden, The University of Kansas, United States*

Friday, July 26 | 13:30 - 15:10 | Room 105

Session FR3.105 | Oral

## Image Processing II

Session Chair: Devis Tuia, Ecole Polytechnique Fédérale de Lausanne (EPFL)

**FR3.105.1** 13:30 **A NEW METHOD BASED ON SPATIAL DIMENSION CORRELATION AND FAST FOURIER TRANSFORM FOR SNR ESTIMATION IN REMOTE SENSING IMAGES**
*Bo Zhu, Xinhong Wang, Ziyang Li, Shuai Dou, Lingli Tang, Chuan-Rong Li, Academy of Opto-Electronics, Chinese Academy of Sciences, China*

**FR3.105.2** 13:50 **COMPARISON OF GLACIER CHANGE DETECTION USING PIXEL BASED & OBJECT BASED CLASSIFICATION TECHNIQUES**
*Sher Muhammad, Chaman Gul, Amir Javed, Javeria Muneer, Mirza Muhammad Waqar, Institute of Space Technology, Pakistan*

**FR3.105.3** 14:10 **SPARSE CODING-BASED TOPIC MODEL FOR REMOTE SENSING IMAGE SEGMENTATION**
*Jun Shi, Zhiguo Jiang, Hao Feng, Yibing Ma, Beijing University of Aeronautics and Astronautics, China*

**FR3.105.4** 14:30 **AN UNMIXING FRAMEWORK TO IMPROVE CLASS ACCURACIES USING DETECTED HIGH IMPORTANCE LOCAL REGIONS**
*Anuj Katiyal, Ks Rajan, IIIT Hyderabad, India*

**FR3.105.5** 14:50 **PANCHROMATIC IMAGE BASED DICTIONARY LEARNING FOR HYPERSPECTRAL IMAGERY DENOISING**
*Minchao Ye, Yuntao Qian, Qi Wang, Zhejiang University, China*

Friday, July 26 | 15:40 - 17:20 | Room 105

Session FR4.105 | Oral

## Image Analysis II

**FR4.105.1** 15:40 **STATISTICAL ASSESSMENT OF DATASET SHIFT AND MODEL PORTABILITY IN MULTI-ANGLE IN-TRACK IMAGE ACQUISITIONS**
*Giona Matasci, University of Lausanne, Switzerland; Nathan Longbotham, Fabio Pacifici, DigitalGlobe Inc., United States; Mikhail Kanevski, University of Lausanne, Switzerland; Devis Tuia, Ecole Polytechnique Fédérale de Lausanne, Switzerland*

**FR4.105.2** 16:00 **A DATA FUSION APPROACH FOR THE ANALYSIS OF AZIMUTH AMBIGUITIES**
*Silvana Dellepiane, Michaela De Martino, Matteo Toma, UNIVERSITA' DEGLI STUDI DI GENOVA, Italy*

**FR4.105.3** 16:20 **A SIFT-BASED MODE-SEEKING PROCEDURE FOR EFFICIENT, ACCURATE REGISTRATION OF REMOTELY SENSED IMAGES**
*Benny Kupfer, Nathan Netanyahu, Bar Ilan University, Israel; Ilan Shimshoni, Haifa University, Israel*

**FR4.105.4** 16:40 **A HYBRID APPROACH TO AUTOMATED LANDSAT PIXEL QUALITY**
*Joshua Sixsmith, Simon Oliver, Leo Lymburner, Geoscience Australia, Australia*

**FR4.105.5** 17:00 **CONTEXTUAL GENETIC ALGORITHM FOR COMPRESSIVE SENSING RECONSTRUCTION OF VHR IMAGES**
*Luca Lorenzi, Farid Melgani, University of Trento, Italy; Grégoire Mercier, Telecom Bretagne, France*

Friday, July 26 | 08:20 - 10:00 | Room 106
Session FR1.106 | Oral

## Polarimetric Statistical Analysis and Modelling

Session Co-Chairs: Carlos Lopez-Martinez, Universitat Politecnica de Catalunya; Si-Wei Chen, National University of Defense Technology

**FR1.106.1** 08:20 **STATISTICAL STUDY OF THE H/A/ALPHA DECOMPOSITION BASED ON A PERTURBATION ANALYSIS OF THE COHERENCY MATRIX**
*Carlos Lopez-Martinez, Alberto Alonso-Gonzalez, Universitat Politècnica de Catalunya (UPC), Spain*

**FR1.106.2** 08:40 **INDEPENDENT COMPONENT ANALYSIS WITHIN POLARIMETRIC INCOHERENT TARGET DECOMPOSITION**
*Nikola Besic, Gabriel Vasile, Jocelyn Chanussot, GIPSA-lab, France; Srdjan Stankovic, University of Montenegro, Yugoslavia; Didier Boldo, Guy d'Urso, Électricité de France (EDF), France*

**FR1.106.3** 09:00 **THE HOTELLING-LAWLEY TRACE STATISTIC FOR CHANGE DETECTION IN POLARIMETRIC SAR DATA UNDER THE COMPLEX WISHART DISTRIBUTION**
*Vahid Akbari, Stian Normann Anfinsen, Anthony Paul Doulgeris, Torbjørn Eltoft, University of Tromsø, Norway*

**FR1.106.4** 09:20 **UNIFORM POLARIMETRIC MATRIX ROTATION THEORY**
*Si-Wei Chen, Yong-Zhen Li, Da-Hai Dai, Xue-Song Wang, Shun-Ping Xiao, State Key Laboratory of Complex Electromagnetic Environment Effects on Electronics and Information System, National University of Defense Technology, China; Motoyuki Sato, Center for Northeast Asian Studies, Tohoku University, Japan*

**FR1.106.5** 09:40 **NOVEL APPROACH FOR THE ANALYSIS OF MULTI-POLARIZED, MULTI-TEMPORAL, AND MULTI-SENSOR SAR DATA**
*Andreas Schmitt, Astrid Gruber, Achim Roth, German Aerospace Center (DLR), Germany*

Friday, July 26 | 10:30 - 12:10 | Room 106
Session FR2.106 | Oral

## Interferometric and Polarimetric Techniques

Session Chair: Nico Adam, German Aerospace Center (DLR)

**FR2.106.1** 10:30 **POLARIMETRIC SAR TOMOGRAPHY WITH SVD-WIENER**
*Yuan Sun, Hong Zhang, Chao Wang, Bo Zhang, Fan Wu, Yixian Tang, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

**FR2.106.2** 10:50 **GLOBAL URBAN MAPPING USING BUILDING DENSITY FROM POLARIMETRIC SAR IMAGES WITH POA CORRECTION**
*Muneyoshi Kajimoto, Junichi Susaki, Kyoto University, Japan*

**FR2.106.3** 11:10 **INTEGRATION OF TERRASAR-X AND TANDEM-X INSAR STACKS FOR COMPLEX URBAN AREA ANALYSIS USING DISTRIBUTED SCATTERERS**
*Kanika Goel, Nico Adam, German Aerospace Center (DLR), Germany*

**FR2.106.4** 11:30 **PERSISTENT SCATTERER INTERFEROMETRY IN COMPLEX URBAN ENVIRONMENTS EXPLOITING TERRASAR-X AND TANDEM-X DATA**
*Kanika Goel, Nico Adam, German Aerospace Center (DLR), Germany*

**FR2.106.5** 11:50 **A NEW COMPACT THREE-COMPONENT DECOMPOSITION SCHEME**
*Lei Xie, Hong Zhang, Chao Wang, Bo Zhang, Fan Wu, Yixian Tang, Center for Earth Observation and Digital Earth, Chinese Academy of Sciences, China*

Friday, July 26 | 13:30 - 15:10 | Room 106
Session FR3.106 | Oral

## Bistatic SAR II

Session Co-Chairs: Ingo Walterscheid, Fraunhofer FHR; Francisco Lopez-Dekker, German Aerospace Center (DLR)

**FR3.106.1** 13:30 **SAR APPLICATIONS USING TANDEM-X ALTERNATING BISTATIC DATA**
*Sergi Duque, Cristian Rossi, Alessandro Parizzi, Nestor Yague-Martinez, Thomas Fritz, German Aerospace Center (DLR), Germany*

**FR3.106.2** 13:50 **MULTISTATIC AND MULTI-ASPECT SAR DATA ACQUISITION TO IMPROVE IMAGE INTERPRETATION**
*Ingo Walterscheid, Andreas Brenner, Fraunhofer Institute for High Frequency Physics and Radar Techniques FHR, Germany*

**FR3.106.3** 14:10 **MOVING TARGET FOCUSING WITH NORMALIZED RELATIVE SPEED IN AZIMUTH-INVARIAN BISTATIC SAR**
*Viet Thuy Vu, Thomas Sjögren, Mats Pettersson, Blekinge Institute of Technology, Sweden*

**FR3.106.4** 14:30 **A FIRST EXPERIMENT OF AIRBORNE BISTATIC FORWARD-LOOKING SAR -PRELIMINARY RESULTS**
*Jianyu Yang, Yulin Huang, Haiguang Yang, Junjie Wu, Wenchao Li, Zhongyu Li, Xiaobo Yang, University of Electronic Science and Technology of China, China*

**FR3.106.5** 14:50 **GENERALIZED FREQUENCY DOMAIN IMAGING ALGORITHM FOR ARBITRARY BISATIC SAR**
*Zhe Liu, Xiaoling Zhang, Jianyu Yang, Huan Huang, University of Electronic Science and Technology of China, China*

Friday, July 26 | 15:40 - 17:20 | Room 106
Session FR4.106 | Oral

## Active Microwave Sensors

Session Chair: James Morris, DSTO

**FR4.106.1** 15:40 **THE PARETO DISTRIBUTION FOR HIGH GRAZING ANGLE SEA-CLUTTER**
*Luke Rosenberg, Stephen Bocquet, DSTO, Australia*

**FR4.106.2** 16:00 **POLARIMETRIC RADAR STUDIES OF SHOALING WAVES**
*Stuart Anderson, James Morris, DSTO, Australia*

**FR4.106.3** 16:20 **DATA PROCESSING AND AIRBORNE EXPERIMENT RESULTS ANALYSIS OF A FULLY POLARIZED SCATTEROMETER**
*Xing-Ou Xu, Xiaolong Dong, Xiangkun Zhang, National Space Science Center, Chinese Academy of Sciences, China; Shaobo Wang, DFH Satellite Co. Ltd., China*

**FR4.106.4** 16:40 **GENERATION OF THE HY-2 SATELLITE ALTIMETER LOOK-UP TABLE TO ACCOUNT FOR THE PTR AND LPF FEATURES**
*Xi-Yu Xu, Ke Xu, Zhen-Zhan Wang, Lei Wang, The CAS Key Laboratory of Microwave Remote Sensing, Center for Space Science and Applied Research, Chinese Academy of Sciences, China*

**FR4.106.5** 17:00 **PRELIMINARY CONSIDERATION ABOUT CALIBRATION AND ATTITUDE ERROR ESTIMATION OF ROTATING FANBEAM SCATTEROMETER USING GROUND CALIBRATION GROUND STATION**
*Jintai Zhu, Xiaolong Dong, National Space Science Center, Chinese Academy of Sciences, China; Wenming Lin, Institute of Marine Sciences(ICM-CSIC), Spain*

Friday, July 26 | 08:20 - 10:00 | Room 109
Session FR1.109 | Oral

## Agriculture: Remote Sensing for Crop Classification and Mapping

Session Co-Chairs: Jean-Marc Garneau, Defence R&D Canada; Alicia Joseph, NASA Goddard Space Flight Center

**FR1.109.1** 08:20 **DERIVING CROP SPECIFIC COVARIATE DATA SETS FROM MULTI-YEAR NASS GEOSPATIAL CROPLAND DATA LAYERS**
*Claire Boryan, Zhengwei Yang, USDA NASS, United States*

**FR1.109.2** 08:40 **IDENTIFICATION OF AGRICULTURAL CROPS IN EARLY STAGES USING REMOTE SENSING IMAGES**
*Silvia Valero, Centre d'Études Spatiales de la BIOsphère, France; Pietro Ceccato, Walter E. Baethgen, International Research Institute for Climate and Society (IRI), Columbia University, United States; Jocelyn Chanussot, GIPSA-lab, Signal & Image Dept., Grenoble Institute of Technology, Grenoble, France*

**FR1.109.3** 09:00 **ANALYSIS ON THE ECOLOGICAL IMPACT OF CROP PLANTING PATTERN CHANGE -A CASE STUDY IN NORTHEAST CHINA**
*Jihua Meng, Miao Zhang, Taifeng Dong, Xingzhi You, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

**FR1.109.4** 09:20 **SPATIAL STATISTIC TO ASSESS REMOTE SENSING ACREAGE ESTIMATES: AN ANALYSIS OF SUGARCANE IN SÃO PAULO STATE, BRAZIL**
*Marcio Pupin Mello, Daniel Alves Aguiar, Bernardo Friedrich Theodor Rudorff, National Institute for Space Research - INPE, Brazil; Edzer Pebesma, Jim Jones, Institute for Geoinformatics (ifgi), Germany; Naiara Carolina Pontes Santos, National Institute for Space Research - INPE, Brazil*

**FR1.109.5** 09:40 **SPECTRAL CLASSIFICATION OF CROP GROUPS FOR LAND USE IDENTIFICATION WITH TEMPORALLY SPARSE TIME-SERIES SATELLITE IMAGES**
*Heather North, David Pairman, Stella Belliss, Stephen McNeill, Landcare Research, New Zealand; Jeromy Cuff, Zach Hill, Environment Canterbury, New Zealand*

Friday, July 26 | 10:30 - 12:10 | Room 109
Session FR2.109 | Oral-Invited

## Mapping of Soils and Vegetation Using Reflectance and Emittance Spectroscopy

**FR2.109.1** 10:30 **REGOLITH LANDORM MAPPING AT THE OLDFIELD WELL (LAVERTON REGION, WESTERN AUSTRALIA) USING ASTER**
*Carsten Laukamp, Commonwealth Scientific and Industrial Research Organisation, Australia*

**FR2.109.2** 10:50 **REGOLITH CHARACTERISATION USING ASTER DATA IN THE CENTRAL NAMIB, NAMIBIA**
*Kombada Mhopjeni, University of Western Australia, Australia; Thomas Cudahy, CSIRO Earth Science and Resource Engineering, Australia; Arianne Ford, University of Western Australia, Australia; Carsten Laukamp, CSIRO Earth Science and Resource Engineering, Australia; Campbell McCuaig, University of Western Australia, Australia*

**FR2.109.3** 11:10 **SPECTROSCOPIC PREDICTIONS OF SOIL ORGANIC CARBON USING A LARGE SCALE LIBRARY: LIMITATIONS AND APPLICATIONS**
*Antoine Stevens, UCLouvain, Belgium; Marco Nocita, Luca Montanarella, Joint Research Centre - European Commission, Italy; Bas van Wesemael, UCLouvain, Belgium*

**FR2.109.4** 11:30 **ESTIMATION OF VEGETATION CLUMPING INDEX USING MULTI-ANGLE IMAGING SPECTRORADIOMETER (MISR) DATA**
*Jan Pisek, Tartu Observatory, Estonia; Liming He, University of Toronto, Canada; Andres Kuusk, Joel Kuusk, Tartu Observatory, Estonia*

**FR2.109.5** 11:50 **BEYOND SPATIAL ENABLEMENT OF GROUNDWATER DEPENDENT ECOSYSTEM MAPPING**
*Zaffar Sadiq Mohamed-Ghouse, Joanne Poon, Sinclair Knight Merz, Australia*

Friday, July 26 | 13:30 - 15:10 | Room 109
Session FR3.109 | Oral

## Urban Remote Sensing II

Session Chair: Jun Zhang, Peking University

**FR3.109.1** 13:30 **UNSUPERVISED HIGH-RESOLUTION GLOBAL MONITORING OF URBAN SETTLEMENTS**
*Mattia Marconcini, Thomas Esch, Andreas Felbier, Wieke Heldens, German Aerospace Center (DLR), Germany*

**FR3.109.2** 13:50 **THE DYNAMIC CHANGE OF THE URBAN THERMAL ENVIRONMENT LANDSCAPE PATTERNS IN BEIJING FROM 2003 TO 2011**
*Mingyu Wang, Yonghua Sun, Dan Meng, Xiaojuan Li, Capital Normal University, China*

**FR3.109.3** 14:10 **URBAN BUILT-UP AREA EXTRACTION USING COMBINED SPECTRAL INFORMATION AND MULTIVARIATE TEXTURE**
*Jun Zhang, Peijun Li, Haiqing Xu, Peking University, China*

**FR3.109.4** 14:30 **WEATHERING IMPACT ON VISIBLE & THERMAL OPTICAL PROPERTIES OF MATERIALS**
*Michael Cathcart, Sarah Lane, Edward Burdette, Georgia Institute of Technology, United States*

**FR3.109.5** 14:50 **BUILDING EXTRACTION USING LIDAR DATA AND VERY HIGH RESOLUTION IMAGE OVER COMPLEX URBAN AREA**
*Peijun Li, Shasha Jiang, Xue Wang, Peking University, China; Jun Zhang, Peking university, China*

Friday, July 26 | 15:40 - 17:20 | Room 109
Session FR4.109 | Oral

## Urban Remote Sensing III

Session Co-Chairs: Fabio Pacifici, DigitalGlobe, Inc.; Mihai Datcu, German Aerospace Center (DLR)

**FR4.109.1** 15:40 **HOW MANY CATEGORIES ARE IN VERY HIGH RESOLUTION SAR IMAGES?**
*Corneliu Octavian Dumitru, Mihai Datcu, German Aerospace Center (DLR), Germany*

**FR4.109.2** 16:00 **A NEW ALGORITHM FOR BUILDING FEATURE EXTRACTION FROM SINGLE AMPLITUDE SAR IMAGES**
*Gerardo Di Martino, Antonio Iodice, Daniele Riccio, Giuseppe Ruello, University of Naples Federico II, Italy*

**FR4.109.3** 16:20 **ANALYSIS OF A NLOS CANYON IN AN INSAR IMAGE OF A URBAN AREA AT KA-BAND**
*Azza Mokadem, Laetitia Thirion, Supélec, France; Elise Colin Koeniguer, ONERA, France*

**FR4.109.4** 16:40 **AN APPROACH FOR IMPROVING BUILDING HEIGHT ESTIMATION FROM INTERFEROMETRIC SAR DATA**
*Giosuè Andrey Giardino, Giovanni Schiavon, Domenico Solimini, University of Rome Tor Vergata, Italy*

**FR4.109.5** 17:00 **TOWARDS EO-BASED SUSTAINABLE URBAN PLANNING AND MANAGEMENT**
*Mattia Marconcini, Thomas Esch, German Aerospace Center (DLR), Germany; Nektarios Chrysoulakis, Foundation for Research and Technology – Hellas (FORTH), Greece; Sebnem Duzgun, Middle East Technical University, Turkey; Tal Abraham, University of Tel Aviv, Israel; Christian Feigenwinter, Eberhard Parlow, University of Basel, Switzerland*

Friday, July 26 | 08:20 - 10:00 | Room 110
Session FR1.110 | Oral

### Land Cover Change: Analysis Techniques I

Session Co-Chairs: William Emery, University of Colorado; Peter Tan, Geoscience Australia

**FR1.110.1** 08:20 **NON-PHYSICAL AND PHYSICAL QUANTITIES FOR THE ANALYSIS OF MULTI-TEMPORAL AND MULTI-ANGULAR OPTICAL VERY HIGH SPATIAL RESOLUTION IMAGES**
*Fabio Pacifici, DigitalGlobe Inc., United States; Nathan Longbotham, William (Bill) Emery, University of Colorado at Boulder, United States*

**FR1.110.2** 08:40 **SVDD-BASED LAND-COVER MAPPING USING OPTIMAL PARAMETERS VIA SINGLE WINDOW FLEXIBLE PACE SEARCH METHOD**
*Guanyuan Shuai, Shuang Zhu, Jinshui Zhang, Xiufang Zhu, College of Resources Science and Technology/State Key Laboratory of Earth Surface Processes and Resource Ecology, Beijing Normal University, China; Guangfeng Liu, No.2 middle school, Botou city, China*

**FR1.110.3** 09:00 **SIMULATION OF ECOHYDROLGOCAL PROCESS USING AN OPTIMALITY BASED MODEL**
*Lajiao Chen, Center for Earth Observation and Digital Earth, Chinese Academy of Sciences, China; Lizhe Wang, Yan Ma, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China; Xiaomin Zhu, Shandong Computer Science Center, China*

**FR1.110.4** 09:20 **A NEW FINER RESOLUTION LAND-USE MAPPING METHOD USING TIME SERIES OF NDVI FROM HJ-1/CCD DATA**
*Peng Ma, Chongqing University of Posts and Telecomunications, China; Bo Zhong, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China; Weisheng Li, Chongqing University of Posts and Telecomunications, China; Qinhuo Liu, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China*

Friday, July 26 | 10:30 - 12:10 | Room 110
Session FR2.110 | Oral

### Land Cover Change: Analysis Techniques II

Session Chair: Fabio Pacifici, DigitalGlobe, Inc.

**FR2.110.1** 10:30 **APPLYING MACHINE LEARNING METHODS AND TIME SERIES ANALYSIS TO CREATE A NATIONAL DYNAMIC LAND COVER DATASET FOR AUSTRALIA**
*Peter Tan, Leo Lymburner, Norman Mueller, Fuqin Li, Medhavy Thankappan, Adam Lewis, Geoscience Australia, Australia*

**FR2.110.2** 10:50 **ATMOSPHERIC CORRECTION AND VALIDATION OF 19-BAND MODIS SURFACE REFLECTANCE IN SUPPORT OF TERRESTRIAL ECOSYSTEM RESEARCH**
*Helen Chedzey, Curtin University, Australia; Brendon McAtee, Western Australian Land Information Authority, Australia; Mark Broomhall, Peter Fearns, Mervyn Lynch, Curtin University, Australia*

**FR2.110.3** 11:10 **CHANGE DETECTION METHOD USING A NEW DIFFERENCE IMAGE FOR REMOTE SENSING IMAGES**
*Lizhong Qiu, Shanghai Jiao Tong University, China; Lei Gao, Beijing Aerospace Automatic Control Institute, China; Yongke Ding, Yuanxiang Li, Shanghai Jiao Tong University, China; Heping Lu, Beijing Aerospace Automatic Control Institute, China; Wenxian Yu, Shanghai Jiao Tong University, China*

**FR2.110.4** 11:30 **INNOVATIVE NDVI TIME-SERIES ANALYSIS BASED ON MULTISPECTRAL IMAGES FOR DETECTING SMALL SCALE VEGETATION COVER CHANGE**
*Xiaojing Li, Linlin Ge, Rattanasuda Cholathat, Zhe Hu, University of New South Wales, Australia*

**FR2.110.5** 11:50 **EVALUATION OF RULE-BASED CLASSIFIER FOR LANDSAT-BASED AUTOMATED LAND COVER MAPPING IN SOUTH AFRICA**
*Brian Salmon, Konrad Wessels, Frans van den Bergh, Karen Steenkamp, Waldo Kleynhans, Derick Swanepoel, Remote Sensing Research Unit, South Africa; David Roy, Valeriy Kovalskyy, Geographic Information Science Center of Excellence, United States*

Friday, July 26 | 13:30 - 15:10 | Room 110
Session FR3.110 | Oral-Invited

### Pleiades: A Dual Optical Constellation for Submetric Observations: Thematic Space Applications I

**FR3.110.1** 13:30 **THE PLEIADES SYSTEM AND DATA DISTRIBUTION**
*Benoit Boissin, Alain Gleyzes, Claire Tinel, CNES, France*

**FR3.110.2** 13:50 **THE PLEIADES USERS THEMATIC COMMISSIONING : FIRST MAIN RESULTS**
*Claire Tinel, Delphine Fontannaz, CNES, France; Bruno Montfort, Astrium GEO-Information Services, France; Hélène de Boissezon, CNES, France*

**FR3.110.3** 14:10 **POTENTIAL OF PLEIADES VHR DATA FOR MAPPING APPLICATIONS**
*Michel Pausader, Jean-Philippe Cantou, Institut Geographique National France, France; Claire Tinel, Delphine Fontannaz, Centre National d'Études Spatiales, France*

**FR3.110.4** 14:30 **ENVIRONMENTAL OBSERVATORY OF SENSITIVE HABITATS, USING PLEIADES HR DATA, CONTRIBUTING TO BIODIVERSITY PROTECTION: CASE OF THE COMMON HAMSTER IN ALSACE, FRANCE**
*Stéphanie Battiston, Jérôme Maxant, SERTIT, France; Claire Tinel, CNES, France; Paul de Fraipont, SERTIT, France*

**FR3.110.5** 14:50 **THE USE OF PLEIADES VHR IMAGES FOR THE MONITORING OF THE STRUCTURES OF MARINE BREAKWATERS AND EMBANKMENTS**
*Antoine Mangin, ACRI-ST, France*

Friday, July 26 | 15:40 - 17:20 | Room 110
Session FR4.110 | Oral-Invited

### Mapping Contaminated Soils using Imaging Spectroscopy

Session Co-Chairs: Cindy Ong, CSIRO; Eyal Ben Dor, Tel Aviv University

**FR4.110.1** 15:40 **MAPPING OF GEOLOGIC SUBSTRATES IMPREGNATED WITH LIQUID HYDROCARBONS USING PROXIMAL AND AIRBORNE HYPERSPECTRAL REMOTE SENSING: POTENTIAL APPLICATIONS FOR ONSHORE EXPLORATION AND LEAKAGE MONITORING**
*Carlos Souza Filho, University of Campinas, Brazil*

**FR4.110.2** 16:00 **ASSESSMENT OF ACID SULFATE SOILS USING HYPERSPECTRAL DATA AT SOUTH YUNDERUP, WESTERN AUSTRALIA**
*Xianzhong Shi, Mehrooz Aspandiar, Curtin University of Technology, Australia; Ian Lau, Commonwealth Scientific and Industrial Research Organisation, Australia*

**FR4.110.3** 16:20 **ESTIMATING SOIL SALINITY USING HYPERSPECTRAL DATA IN THE WESTERN AUSTRALIAN WHEAT BELT**
*Chiaki Kobayashi, Infoserve Inc., Japan; Ian Lau, Commonwealth Scientific and Industrial Research Organisation, Australia; Buddy Wheaton, Dan Carter, DAFWA, Australia; Lindsay Bourke, DEC, Australia; Norichika Asada, Osamu Kashimura, Japan Space Systems, Japan; Cindy Ong, Thomas Cudahy, Commonwealth Scientific and Industrial Research Organisation, Australia*

**FR4.110.4** 16:40 **AN EVALUATION OF MULTISPECTRAL VHR IMAGERY FOR SOIL SALINITY MONITORING**
*Divan Vermeulen, Adriaan van Niekerk, Stellenbosch University, South Africa*

Friday, July 26 | 08:20 - 10:00 | Room 111
Session FR1.111 | Oral-Invited

### Space Lidar: Missions, Technologies and Observations

Session Co-Chairs: Upendra Singh, NASA Langley Research Center; Georgios Tzeremes, European Space Agency

**FR1.111.1** 08:20 **ADVANCES ON COHERENT DOPPLER WIND LIDAR FOR NASA 3-D WINDS MISSION**
*Upendra Singh, Michael Kavaya, Jirong Yu, Mulugeta Petros, Grady Koch, NASA Langley Research Center, United States*

**FR1.111.2** 08:40 **ICESAT-2: THE NEXT-GENERATION SPACEBORNE LASER ALTIMETRY MISSION TO MEASURE ICE SHEET ELEVATION, SEA ICE THICKNESS, AND VEGETATION HEIGHTS**
*Thorsten Markus, Thomas Neumann, Anthony Martino, NASA Goddard Space Flight Center, United States*

**FR1.111.3** 09:00 **ESA LIDAR SPACE MISSIONS AND SUPPORTING ACTIVITIES**
*Errico Armandillo, Georgios Tzeremes, Arnaud Heliere, Denny Wernham, Anne Grete Straume, European Space Agency, Netherlands*

**FR1.111.4** 09:20 **PRELIMINARY STUDIES FOR A VEGETATION LADAR/LIDAR SPACE MISSION IN FRANCE**
*Sylvie Durrieu, UMR TETIS, France; Selma Cherchali, Josiane Costeraste, Linda Mondin, CNES, France; Henri Debise, UMR TETIS, France; Patrick Chazette, LSCE, France; Jean Dauzat, CIRAD AMAP, France; Jean-Philippe Gastellu-Etchegorry, Centre d'Études Spatiales de la BIOsphère, France; Nicolas Baghdadi, UMR TETIS, France; Raphael Pelissier, CIRAD AMAP, France*

**FR1.111.5** 09:40 **AN AUTOMATED STATISTICAL ANALYSIS APPROACH TO NOISE REDUCTION FOR PHOTON-COUNTING LIDAR SYSTEMS**
*Kimberly H. Horan, John P. Kerekes, Rochester Institute of Technology, United States*

Friday, July 26 | 10:30 - 12:10 | Room 111
Session FR2.111 | Oral-Invited

### Vegetation Structure from Multi-frequency Measurements

Session Chair: Matteo Pardini, German Aerospace Center (DLR)

**FR2.111.1** 10:30 **POLARIMETRIC TOMOGRAPHY FOR FOREST PARAMETERS RETRIEVAL**
*Bassam El Hajj Chehade, Laurent Ferro-Famil, Université Rennes1, France*

**FR2.111.2** 10:50 **PHYSICAL INTERPRETATIONS OF LIDAR AND X-BAND INSAR STRUCTURE OF TROPICAL FORESTS IN COSTA RICA AND BRAZIL**
*Robert Treuhaft, Jet Propulsion Laboratory / California Institute of Technology, United States; Fabio Gonçalves, Oregon State University, United States; Soren Madsen, Maxim Neumann, Bruce Chapman, Scott Hensley, Jet Propulsion Laboratory / California Institute of Technology, United States; Joao Roberto dos Santos, Camila Silva, Luciano Dutra, Instituto Nacional de Pesquisas Espaciais, Brazil; Michael Palace, University of New Hampshire, United States; Paulo Graça, Instituto Nacional de Pesquisas da Amazônia, Brazil*

**FR2.111.3** 11:10 **ESTIMATING AND UNDERSTANDING VERTICAL STRUCTURE OF FORESTS FROM MULTIBASELINE TANDEM-X POL-INSAR DATA**
*Matteo Pardini, Astor Torano-Caicoya, Florian Kugler, Konstantinos P. Papathanassiou, German Aerospace Center (DLR), Germany*

**FR2.111.4** 11:30 **DEVELOPMENT OF VOLUME STRUCTURE APPLICATIONS BY MEANS OF POL-INSAR TECHNIQUES: ACTUAL STATUS AND NEW CHALLENGES**
*Konstantinos P. Papathanassiou, Irena Hajnsek, German Aerospace Center (DLR), Germany*

**FR2.111.5** 11:50 **VEGETATION INDEX COMPOSITING WITH AVHRR, MODIS AND FY3 VIRR**
*Xin Long, Jing Li, Qinhuo Liu, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

Friday, July 26 | 13:30 - 15:10 | Room 111
Session FR3.111 | Oral-Invited

### Image Information Mining II

Session Co-Chairs: Mihai Datcu, German Aerospace Center (DLR); Gottfried Schwarz, German Aerospace Center (DLR)

**FR3.111.1** 13:30 **PREPARATION OF SCENARIOS FOR THE PERFORMANCE OPTIMIZATION OF A CONTENT-BASED REMOTE SENSING IMAGE MINING SYSTEM**
*Gottfried Schwarz, Mihai Datcu, German Aerospace Center (DLR), Germany*

**FR3.111.2** 13:50 **AN EFFECTIVE ACTIVE LEARNING METHOD FOR INTERACTIVE CONTENT-BASED RETRIEVAL IN REMOTE SENSING IMAGES**
*Begum Demir, Lorenzo Bruzzone, University of Trento, Italy*

**FR3.111.3** 14:10 **A DATA MINING APPROACH TO DISCOVER COLLECTIONS OF HOMOGENEOUS REGIONS IN SATELLITE IMAGE TIME SERIES**
*Pierre-Nicolas Mougel, Nazha Selmaoui-Folcher, Université de Nouvelle Calédonie, New Caledonia*

**FR3.111.4** 14:30 **COMPARISON OF SELECTED TEXTURAL FEATURES AS GLOBAL CONTENT-BASED DESCRIPTORS OF VHR SATELLITE IMAGE**
*Wojciech Drzewiecki, AGH University of Science and Technology, Poland; Anna Wawrzaszek, Sebastian Aleksandrowicz, Michal Krupinski, Space Research Center, Polish Academy of Sciences, Poland; Katarzyna Bernat, AGH University of Science and Technology, Poland*

**FR3.111.5** 14:50 **THE IMPACT OF RAIN, FROST, SEASONAL CYCLE, AND WIND ON SEQUENCES OF HIGH RESOLUTION URBAN SAR IMAGES**
*Gottfried Schwarz, Mihai Datcu, German Aerospace Center (DLR), Germany*

Friday, July 26 | 15:40 - 17:20 | Room 111
Session FR4.111 | Oral-Invited

### Image Information Mining III

Session Chair: Mihai Datcu, German Aerospace Center (DLR)

**FR4.111.1** 15:40 **MULTI-LEVEL FEATURE ANALYSIS FOR SEMANTIC CATEGORY RECOGNITION**
*Harini Sridharan, Anil Cheriyadat, Oak Ridge National Laboratory, United States*

**FR4.111.2** 16:00 **A COMPARISON STUDY BETWEEN WINDOWING AND BINARY PARTITION TREES FOR HYPERSPECTRAL IMAGE INFORMATION MINING**
*Miguel Angel Veganzones, Guillaume Tochon, Mauro Dalla-Mura, GIPSA-lab, France; Antonio J. Plaza, University of Extremadura, Spain; Jocelyn Chanussot, GIPSA-lab, France*

**FR4.111.3** 16:20 **IMAGE REGISTRATION BY AUTOMATIC SUBIMAGE SELECTION AND MAXIMIZATION OF COMBINED MUTUAL INFORMATION AND SPATIAL INFORMATION**
*Anthony Amankwah, University of Witwatersrand, South Africa*

**FR4.111.4** 16:40 **UNSUPERVISED CLASSIFICATION OF AGRICULTURAL LAND COVER USING POLARIMETRIC SYNTHETIC APERTURE RADAR VIA A SPARSE TEXTURE DICTIONARY MODEL**
*Robert Amelard, Alexander Wong, David Clausi, University of Waterloo, Canada*

**FR4.111.5** 17:00 **IMAGE PATCH CHARACTERIZATION WITH SHAPE DISTRIBUTIONS: APPLICATION TO WORLDVIEW-2 IMAGES**
*Lionel Gueguen, DigitalGlobe Inc., United States*

Friday, July 26 | 08:20 - 10:00 | Room 112
Session FR1.112 | Oral

## Sensor and Model Synergies I

Session Chair: Davina White, University of Adelaide

**FR1.112.1** 08:20 **ADVANCES IN SYNERGY OF AATSR-MERIS SENSORS FOR CLOUD DETECTION**
*Luis Gómez-Chova, Jordi Muñoz-Marí, Julia Amorós-López, Emma Izquierdo-Verdiguier, Gustavo Camps-Valls, University of Valencia, Spain*

**FR1.112.2** 08:40 **CLASSIFYING THE CANADIAN BOREAL FOREST'S STRUCTURE USING MULTI-MODAL REMOTE SENSING AND EXTRAPOLATION TECHNIQUES**
*Michael Benson, Leland Pierce, Kamal Sarabandi, University of Michigan, United States*

**FR1.112.3** 09:00 **OPTIMAL FUSION OF ALARM SETS FROM MULTIPLE DETECTORS USING DYNAMIC PROGRAMMING**
*Brandon Smock, Taylor Glenn, Joseph Wilson, University of Florida, United States*

**FR1.112.4** 09:20 **NEW INSIGHTS AND TOOLS FOR MONITORING AUSTRALIAN GREAT ARTESIAN BASIN WETLANDS FROM MULTI-SENSOR SYNERGIES**
*Megan Lewis, Davina White, The University of Adelaide, Australia*

**FR1.112.5** 09:40 **THE FUSION OF THAICHOTE, X AND C-BAND SYNTHETIC APERTURE RADAR IMAGERY FOR ESTIMATING GRAIN YIELD**
*Jiratiwan Kruasilp, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China; Amornchai Prakobya, Chonticha Chitpaiboon, Geo-informatics and Space Technology Development Agency (GISTDA), Thailand; Bingfang Wu, Jihua Meng, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China*

Friday, July 26 | 10:30 - 12:10 | Room 112
Session FR2.112 | Oral

## Optical and Hyperspectral Sensors

Session Chair: Daniel Bongiorno, University of Sydney

**FR2.112.1** 10:30 **OZONE MAPPER PROFILER SUITE EARLY ORBIT LINEARITY PERFORMANCE EVALUATION**
*Chunhui Pan, University of Maryland, United States; Xiangqian Wu, Fred Wu, M. Grotenhuis, National Oceanic and Atmospheric Administration, United States*

**FR2.112.2** 10:50 **DATA PRODUCT OF HYPERSPECTRAL IMAGER SUITE (HISUI)**
*Akira Iwasaki, The University of Tokyo, Japan; Hirokazu Yamamoto, National Institute of Advanced Industrial Science and Technology, Japan*

**FR2.112.3** 11:10 **OBSERVATION PLANNING AND ITS COVERAGE SIMULATION OF A JAPANESE SPACEBORNE SENSOR: HYPERSPECTRAL IMAGER SUITE (HISUI)**
*Kenta Ogawa, Rakuno Gakuen University, Japan; Tsuneo Matsunaga, Satoru Yamamoto, National Institute for Environmental Studies, Japan; Osamu Kashimura, Tetsushi Tachikawa, Japan Space Systems, Japan; Satoshi Tsuchida, National Institute of Advanced Industrial Science and Technology, Japan; Jun Tanii, Japan Space Systems, Japan; Shuichi Rokugawa, University of Tokyo, Japan*

**FR2.112.4** 11:30 **DEVELOPMENT OF UAV-MOUNTED MINIATURURE HYPERSPECTRAL SENSOR SYSTEM FOR AGRICULTURAL MONITORING**
*Kuniaki Uto, Haruyuki Seki, Genya Saito, Yukio Kosugi, Tokyo Institute of Technology, Japan*

**FR2.112.5** 11:50 **STATUS OF MODIS INSTRUMENT AND RADIOMETRIC CALIBRATION**
*Xiaoxiong Xiong, NASA Goddard Space Flight Center, United States; Brian Wenny, Sigma Space Corporation, United States; Amit Angal, SSAI, United States; Junqiang Sun, Sigma Space Corporation, United States; Vincent Salomonson, University of Utah, United States; William Barnes, UMBC, United States*

Friday, July 26 | 13:30 - 15:10 | Room 112
Session FR3.112 | Oral

## Hyperspectral Parameters

Session Co-Chairs: Claudia Spinetti, INGV; Leo Lymburner, Geoscience Australia

**FR3.112.1** 13:30 **OPERATIONAL CALIBRATION OF APEX**
*Andreas Hueni, University of Zurich, Switzerland; Sindy Sterckx, VITO, Belgium; Michael Jehle, University of Zurich, Switzerland*

**FR3.112.2** 13:50 **2012 HYPERSPECTRAL AIRBORNE CAMPAIGN ON ETNA: MULTI DATA ACQUISITION FOR ASI-PRISMA PROJECT**
*Laura Colini, Claudia Spinetti, Fawzi Doumaz, Stefania Amici, INGV, Italy; Cristina Ananasso, ASI, Italy; Maria Fabrizia Buongiorno, INGV, Italy; Paolo Cafaro, maricogecap, Italy; Tommaso Caltabiano, INGV, Italy; Gabriele Curci, CTEMS, Italy; Salvatore d'Andrea, maricogecap, Italy; Massimiliano Favalli, Salvatore Giammanco, Ilaria Isola, Alessandro La Spina, Valerio Lombardo, INGV, Italy; Marco Mancini, maricogecap, Italy; Francesco Mazzarini, Massimo Musacchio, Marco Neri, Giuseppe Puglisi, Giuseppe Salerno, INGV, Italy; Valentina Sarli, CGIAM, Italy; Malvina Silvestri, INGV, Italy; Sergio Teggi, UNIMORE, Italy*

**FR3.112.3** 14:10 **IMPACT OF SIGNAL-TO-NOISE RATIO IN A HYPERSPECTRAL SENSOR ON THE ACCURACY OF RETRIEVED CONSTITUENT CONCENTRATIONS IN INLAND AND COASTAL WATERS**
*Wesley Moses, Jeffrey Bowles, Robert Lucke, Michael Corson, Naval Research Laboratory, United States*

**FR3.112.4** 14:30 **USING BRDF CORRECTED SURFACE REFLECTANCE TO ENABLE A SENSOR INDEPENDENT OBSERVATION STRATEGY**
*Alexis McIntyre, Fuqin Li, Leo Lymburner, Alex Ip, Medhavy Thankappan, Geoscience Australia, Australia*

**FR3.112.5** 14:50 **AUTOMATIC SPECTROMETER/RGB CAMERA SPATIAL CALIBRATION**
*Daniel Bongiorno, University of Sydney, Australia; Adam Fairley, Defence Science and Technology Organisation, Australia; Mitch Bryson, Stefan Williams, University of Sydney, Australia*

Friday, July 26 | 15:40 - 17:20 | Room 112
Session FR4.112 | Oral

## Calibration and Instruments

Session Co-Chairs: Takeo Tadono, Japan Aerospace Exploration Agency (JAXA); Andreas Hueni, Universität Zürich

**FR4.112.1** 15:40 **APEX: SPECTRAL SENSOR CALIBRATION IN REGIONS OF ATMOSPHERIC ABSORPTION**
*Michael Jehle, Andreas Hueni, Alexander Damm, University of Zurich, Switzerland; Karim Lenhard, Andreas Baumgartner, German Aerospace Center (DLR), Germany; Mathias Kneubühler, Michael E. Schaepman, University of Zurich, Switzerland*

**FR4.112.2** 16:00 **GROUND CALIBRATION OF COMPACT INFRARED CAMERA (CIRC) FOR EARTH OBSERVATION**
*Ryoko Nakamura, Haruyoshi Katayama, Masataka Naitoh, Masatomo Harada, Eri Kato, Japan Aerospace Exploration Agency, Japan; Koji Nakau, Hokkaido University, Japan; Ryota Sato, Japan Aerospace Exploration Agency, Japan*

**FR4.112.3** 16:20 **FEASIBILITY STUDY OF PRISM-2 ONBOARD ALOS-3 -SIMULATED IMAGE GENERATION-**
*Takeo Tadono, Hiroko Imai, Fumi Ohgushi, Japan Aerospace Exploration Agency, Japan; Junichi Takaku, Tomohiro Watanabe, Remote Sensing Technology Center of Japan, Japan*

**FR4.112.4** 16:40 **BLIND SUPER-RESOLUTION CONSIDERING A POINT SPREAD FUNCTION OF PUSHBROOM SATELLITE IMAGING SYSTEM**
*Shinji Nakazawa, Akira Iwasaki, The University of Tokyo, Japan*

**FR4.112.5** 17:00 **A NOVEL METHOD OF DESTRIPING FOR AIRBORNE HYPERSPECTRAL IMAGE**
*Yini Duan, Lei Yan, Xin Jing, Peking University, China*

Friday, July 26 | 08:20 - 10:00 | Room 207

Session FR1.207 | Oral

## Spaceborne SAR

Session Chair: Paul Rosen, NASA Jet Propulsion Laboratory

**FR1.207.1** 08:20 **FIELD CALIBRATION AND VALIDATION OF RADARSAT-2**
*Xiao Zhou, Qiming Zeng, Jian Jiao, Qing Wang, Siting Xiong, Sheng Gao, Peking University, China*

**FR1.207.2** 08:40 **EXPLORING THE TRADE-SPACE OF MIMO SAR**
*Marwan Younis, Paco Lopez-Dekker, Federica Bordoni, Piotr Laskowski, Gerhard Krieger, German Aerospace Center (DLR), Germany*

**FR1.207.3** 09:00 **CORRELATING SAR (COSAR): CONCEPT, PERFORMANCE ANALYSIS, AND MISSION CONCEPTS**
*Paco Lopez-Dekker, Francesco De Zan, Marc Rodriguez-Cassola, Gerhard Krieger, German Aerospace Center (DLR), Germany*

**FR1.207.4** 09:20 **SIMULATION OF IONOSPHERIC EFFECTS ON L-BAND SYNTHETIC APERTURE RADAR IMAGES**
*Giorgio Gomba, Michael Eineder, Thomas Fritz, Alessandro Parizzi, German Aerospace Center (DLR), Germany*

**FR1.207.5** 09:40 **POSSIBLE EXTENSION OF BANDWIDTH OF L BAND SAR MOUNTED ON SMALL SATELLITES**
*Korehiro Maeda, The University of Tokyo, Japan*

Friday, July 26 | 10:30 - 12:10 | Room 207

Session FR2.207 | Oral

## UAV, Airborne and GB-SAR

**FR2.207.1** 10:30 **UAVSAR PROGRAM: INITIAL RESULTS FROM NEW INSTRUMENT CAPABILITIES**
*Yunling Lou, Scott Hensley, Jet Propulsion Laboratory, United States; Mahta Moghaddam, University of Southern California, United States; Delwyn Moller, Remote Sensing Solutions, United States; Elaine Chapin, Alexandra Chau, Duane Clark, Brian Hawkins, Cathleen Jones, Phillip Marks, Thierry Michel, Ron Muellerschoen, Joanne Shimada, Yang Zheng, Jet Propulsion Laboratory, United States*

**FR2.207.2** 10:50 **THE KASAR AIRBORNE CAMPAIGN**
*Jean-François Nouvel, Pascale Dubois-Fernandez, Xavier Dupuis, DEMR/RIM, France*

**FR2.207.3** 11:10 **A MULTIFUNCTIONAL UAV SAR (MFUSAR) —SYSTEM DESIGN AND EXPERIMENTAL RESULTS**
*Wang Yanfei, Liu Chang, Zhan Xueli, Wang Qi, Liu Xiuqing, Institute of Electronics, Chinese Academy of Sciences, China*

**FR2.207.4** 11:30 **CHARACTERIZATION OF BASIC SCATTERING MECHANISMS USING LABORATORY BASED POLARIMETRIC SYNTHETIC APERTURE RADAR IMAGING**
*Sanjit Maitra, Micheal G. Gartley, Jason Faulring, John P. Kerekes, Rochester Institute of Technology, United States*

**FR2.207.5** 11:50 **A NEW SMALL AIRBORNE SAR BASED ON PI-SAR2**
*Takashi Fujimura, Kiyonobu Ono, Hidefumi Nagata, Tsunekazu Kimura, Minoru Murata, NEC Corporation, Japan*

Friday, July 26 | 13:30 - 15:10 | Room 207

Session FR3.207 | Oral

## Radar Processing and Calibration

Session Chair: Alberto Moreira, German Aerospace Center (DLR)

**FR3.207.1** 13:30 **IMPACT OF SAR DATA QUANTIZATION ON TANDEM-X PERFORMANCE**
*Michele Martone, Benjamin Braeutigam, Paola Rizzoli, Gerhard Krieger, German Aerospace Center (DLR), Germany*

**FR3.207.2** 13:50 **ESTIMATION OF TROPOSPHERIC DELAYS USING SYNTHETIC APERTURE RADAR AND SQUINT DIVERSITY**
*Marc Rodriguez-Cassola, Pau Prats-Iraola, Marc Jaeger, Andreas Reigber, Alberto Moreira, German Aerospace Center (DLR), Germany*

**FR3.207.3** 14:10 **PERSISTENT POINT SCATTERER ANALYSIS IN COSMO SKYMED SAR DATA**
*Pietro Guccione, Mariantonietta Zonno, Luigi Mascolo, Politecnico di Bari, Italy*

**FR3.207.4** 14:30 **EXTRACTING OCEAN SURFACE CURRENTS FROM SYNTHETIC APERTURE RADAR (SAR): MAXIMUM CROSS CORRELATION AND DOPPLER CENTROID METHODS**
*Waqas Qazi, William (Bill) Emery, University of Colorado, United States; Morten Hansen, Nansen Environmental and Remote Sensing Center, Norway*

**FR3.207.5** 14:50 **HIGH RESOLUTION GEODETIC EARTH OBSERVATION WITH TERRASAR-X: CORRECTION SCHEMES AND VALIDATION**
*Ulrich Balss, German Aerospace Center (DLR), Germany; Christoph Gisinger, Xiao Ying Cong, Technische Universität München (TUM), Germany; Ramon Brcic, German Aerospace Center (DLR), Germany; Peter Steigenberger, Technische Universität München (TUM), Germany; Michael Eineder, German Aerospace Center (DLR), Germany; Roland Pail, Urs Hugentobler, Technische Universität München (TUM), Germany*

Friday, July 26 | 15:40 - 17:20 | Room 207

Session FR4.207 | Oral-Invited

## Digital Calibration Techniques for Multi-Channel SAR Systems

Session Chair: Marwan Younis, German Aerospace Center (DLR)

**FR4.207.1** 15:40 **DIGITAL CALIBRATION FOR NEXT-GENERATION X-BAND SAR**
*Thomas Fügen, Jung-Hyo Kim, Christian Fischer, Christoph Heer, Astrium GmbH, Germany; Rolf Werninghaus, German Aerospace Center (DLR), Germany*

**FR4.207.2** 16:00 **ERROR ANALYSIS AND CALIBRATION TECHNIQUES FOR MULTI-CHANNEL SAR INSTRUMENTS**
*Piotr Laskowski, Federica Bordoni, Marwan Younis, German Aerospace Center (DLR), Germany*

**FR4.207.3** 16:20 **CHANNEL ERROR ESTIMATION METHODS FOR MULTI-CHANNEL HRWS SAR SYSTEMS**
*Taoli Yang, Zhenfang Li, Yanyang Liu, Zhiyong Suo, Zheng Bao, Xidian University, China*

**FR4.207.4** 16:40 **ON THE CALIBRATION OF POLARIMETRIC SAR DATA WITH A NUMERICAL METHOD**
*Alberto Villa, Aresys/Politecnico di Milano, Italy; Lorenzo Iannini, Politecnico di Milano / Delft University, Italy; Davide Giudici, Aresys, Italy; Andrea Monti-Guarnieri, Stefano Tebaldini, Politecnico di Milano, Italy; Andrea Recchia, Aresys srl / Politecnico di Milano, Italy*

**FR4.207.5** 17:00 **POLARIMETRIC CALIBRATION OF THE NICT AIRBORNE X-BAND SAR, PI-SAR2**
*Makoto Satake, Tatsuharu Kobayashi, Jyunpei Uemoto, Toshihiko Umehara, Shoichiro Kojima, Takeshi Matsuoka, Akitsugu Nadai, Seiho Uratsuka, National Institute of Information and Communications Technology, Japan*

Friday, July 26 | 08:20 - 10:00 | Room 208
Session FR1.208 | Oral-Invited

## The Surface Water and Ocean Topography (SWOT) Mission

Session Co-Chairs: Roger Fjørtoft, Centre National d'Etudes Spatiales (CNES); Delwin Moller, Remote Sensing Solutions

**FR1.208.1** 08:20 **THE SURFACE WATER AND OCEAN TOPOGRAPHY (SWOT) MISSION SYSTEM DESCRIPTION**
*Parag Vaze, California Institute of Technology - Jet Propulsion Laboratory, United States; Thierry Lafon, Centre National d'Études Spatiales, France*

**FR1.208.2** 08:40 **EMPIRICAL CROSS-CALIBRATION OF COHERENT SWOT ERRORS USING EXTERNAL REFERENCES AND THE ALTIMETRY CONSTELLATION**
*Gérald Dibarboure, Sylvie Labroue, Mickaël Ablain, CLS Space Oceanography Division, France; Roger Fjørtoft, Alain Mallet, Juliette Lambin, Jean-Claude Souyris, CNES, France; François Soulat, CLS Space Oceanography Division, France*

**FR1.208.3** 09:00 **NEAR-NADIR KA-BAND BACKSCATTERING MODELS AND EXPERIMENTAL ASSESSMENT**
*Alexandra Bringer, Aix-Marseille Université, France; Olivier Boisot, Université de Toulon, France; Guillemette Caulliez, CNRS, France; Sébastien Pioch, Université de Toulon, France; Pierre Borderies, ONERA, France; Jean-Claude Lalaurie, CNES, France; Laiba Amarouche, CLS, France; Charles-Antoine Guérin, Université de Toulon, France*

**FR1.208.4** 09:20 **PROCESSING OF PROPOSED KARIN/SWOT DATA**
*Roger Fjørtoft, Centre National d'Études Spatiales, France; Philip S. Callahan, Ernesto Rodriguez, Jet Propulsion Laboratory / California Institute of Technology, United States; Damien Desroches, Centre National d'Études Spatiales, France*

**FR1.208.5** 09:40 **THE KA-BAND SWOT PHENOMENOLOGY AIRBORNE RADAR (KASPAR) FOR AIRSWOT PLATFORM**
*James Carswell, Delwyn Moller, Torry Akins, Dan Robinson, Remote Sensing Solutions, United States*

Friday, July 26 | 10:30 - 12:10 | Room 208
Session FR2.208 | Oral

## Data Management and Systems II

Session Co-Chairs: Mihai Datcu, German Aerospace Center (DLR); Liam Gumley, University of Wisconsin-Madison

**FR2.208.1** 10:30 **JPSS CGS EVOLUTION**
*Shawn Miller, Kerry Grant, Michael Jamilkowski, Raytheon Company, United States*

**FR2.208.2** 10:50 **SUOMI NATIONAL POLAR-ORBITING PARTNERSHIP (SUOMI NPP) GROUND SYSTEM PERFORMANCE**
*Kerry Grant, Craig Bergeron, Raytheon Company, United States*

**FR2.208.3** 11:10 **PRODUCTION OF DIAS SATELLITE DATASETS, JAXA'S CONTRIBUTION TO DIAS & GRENE-EI**
*Kazuo Umezawa, Japan Aerospace Exploration Agency, Japan*

**FR2.208.4** 11:30 **THE COMMUNITY SATELLITE PROCESSING PACKAGE (CSPP) FOR REAL-TIME PROCESSING OF DATA RECEIVED BY DIRECT BROADCAST FROM SUOMI NPP, POES, METOP, AND FY-3.**
*Liam Gumley, Allen Huang, Kathleen Strabala, Scott Mindock, Ray Garcia, Geoff Cureton, Graeme Martin, Nadia Smith, Elisabeth Weisz, University of Wisconsin-Madison, United States*

**FR2.208.5** 11:50 **AN INDEX AND RETRIEVAL METHOD OF SPATIAL DATA BASED ON GEOSOT GLOBAL DISCRETE GRID SYSTEM**
*Nan Lu, Chengqi Cheng, An Jin, Peking University, China; Haijian Ma, National Earthquake Infrastructure Service, China*

Friday, July 26 | 13:30 - 15:10 | Room 208
Session FR3.208 | Oral

## Data Management and Systems III

Session Co-Chairs: Mihai Datcu, German Aerospace Center (DLR); Barbara Rasaiah, RMIT University

**FR3.208.1** 13:30 **SPECCHIO FOR AUSTRALIA: TAKING SPECTROSCOPY DATA FROM THE SENSOR TO DISCOVERY FOR THE AUSTRALIAN REMOTE SENSING COMMUNITY**
*Laurie Chisholm, University of Wollongong, Australia; Andreas Hueni, University of Zurich, Switzerland; Cindy Ong, Commonwealth Scientific and Industrial Research Organisation, Australia; Matthew Wyatt, iVEC, Australian National Data Service, Australia; Tim Malthus, Commonwealth Scientific and Industrial Research Organisation, Australia; Simon Jones, RMIT University, Australia; Megan Lewis, University of Adelaide, Australia; Stuart Phinn, University of Queensland, Australia*

**FR3.208.2** 13:50 **INTEGRATING FULL RESOLUTION IMAGERY INTO NASA'S EARTH OBSERVING SYSTEM DATA AND INFORMATION SYSTEM**
*Kevin Murphy, Ryan Boller, NASA Goddard Space Flight Center, United States*

**FR3.208.3** 14:10 **APPROACHES TO ESTABLISHING A METADATA STANDARD FOR FIELD SPECTROSCOPY DATASETS**
*Barbara Rasaiah, RMIT University, Australia; Tim Malthus, Commonwealth Scientific and Industrial Research Organisation, Australia; Chris Bellman, RMIT University, Australia; Laurie Chisholm, University of Wollongong, Australia; John Gamon, University of Alberta, Canada; Andreas Hueni, University of Zurich, Switzerland; Alfredo Huete, University of Technology, Sydney, Australia; Simon Jones, RMIT University, Australia; Cindy Ong, Commonwealth Scientific and Industrial Research Organisation, Australia; Stuart Phinn, Chris Roelfsema, University of Queensland, Australia; Lola Suarez, RMIT University, Australia; Philip Townsend, University of Wisconsin-Madison, United States; Rebecca Trevithick, Queensland Department of Environment and Resource Management, Australia; Matthew Wyatt, iVEC, Australian National Data Service, Australia*

**FR3.208.4** 14:30 **APPLICATION OF DYNAMIC DATA-DRIVEN APPLICATION SYSTEM (DDDAS) IN MARINE OIL SPILL MANAGEMENT: A NEW FRAMEWORK COMBINING MULTIPLE SOURCE REMOTE SENSING MONITORING AND SIMULATION AS A SYMBIOTIC FEEDBACK CONTROL SYSTEM**
*Yao Li, Beijing University of Technology, China; Lizhe Wang, Lajiao Chen, Yan Ma, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China; Xiaomin Zhu, Shandong Computer Science Center, China; Chu Bin, Beijing University of Technology, China*

Friday, July 26 | 15:40 - 17:20 | Room 208
Session FR4.208 | Oral-Invited

## Pleiades: a Dual Optical Constellation for Submetric Observations: Thematic Space Applications II

**FR4.208.1** 15:40 **THE PLEIADES USERS GROUP**
*Vanessa Bonnet Souleres, Astrium GmbH, France; James Prior, Astrium GmbH - Spot Imaging Services, Australia; Didier Giacobbo, Astrium GmbH, France; Claire Tinel, CNES, France*

**FR4.208.2** 16:00 **PLEIADES IN THE CONTEXT OF THE INTERNATIONAL CHARTER "SPACE AND MAJOR DISASTERS"**
*Catherine Proy, Claire Tinel, Delphine Fontannaz, CNES, France*

**FR4.208.3** 16:20 **USE OF PLEIADES VHR DATA FOR RISK MANAGEMENT AND SUSTAINABLE RECONSTRUCTION IN HAITI: THE EXAMPLE OF KAL-HAITI RESEARCH DATABASE**
*Delphine Fontannaz, Alain Giros, Centre National d'Études Spatiales, France; Bernard Allenbach, SERTIT, France; Didier Treinsoutrot, Ministère de l'Ecologie du Développement Durable et de l'Energie, France; Marcello de Michele, Bureau de Recherches Géologiques et Minières, France*

**FR4.208.4** 16:40 **MONITORING OF PACIFIC ISLANDS' ENVIRONMENT FROM THE MOUNTAIN TO THE CORAL REEFS UNDER MINING CONSTRAINTS : CASE STUDY OF THE GREAT SOUTH OF NEW CALEDONIA WITH PLEIADES VHR DATA**
*Rémi Andreoli, Bluecham SAS, New Caledonia; Cyril Marchand, IRD, New Caledonia; Nazha Folcher-Selmaoui, UNC, New Caledonia; Hervé Yésou, UDS, France; Claire Tinel, Delphine Fontannaz, CNES, France*

**FR4.208.5** 17:00 **SYNERGY OF VHR PLEIADES DATA AND SWIR SPECTRAL BANDS FOR FLOOD DETECTION AND IMPACT ASSESSMENT IN URBAN AREAS: CASE OF KRYMSK, RUSSIAN FEDERATION, IN JULY 2012**
*Claire Huber, Stéphanie Battiston, Hervé Yésou, SERTIT, France; Claire Tinel, André Laurens, CNES, France; Mathias Studer, SERTIT, France*

# Poster Sessions

## SAR Interferometry I

Session Co-Chairs: Gopalan Venkataraman, Indian Institute of Technology Bombay; Gordon Farquharson, University of Washington

**MOP.P1.1** Board 1 **COMPARISON OF DEMS DERIVED FROM TANDEM-X AND SRTM-C FOR HIMALAYAN TERRAIN**
*Pratima Pandey, Gopalan Venkataraman, Indian Institute of Technology Bombay, India*

**MOP.P1.2** Board 2 **ATI SAR SIGNATURES OF NEARSHORE OCEAN BREAKING WAVES OBTAINED FROM FIELD MEASUREMENTS**
*Yuriy V. Goncharenko, Institute of Radiophysics and Electronics NAS of Ukraine, Ukraine; Gordon Farquharson, University of Washington, United States*

**MOP.P1.3** Board 3 **EFFECT OF IONOSPHERE REFRACTION ON SPACEBORNE SAR IMAGING PRECISION**
*Guojun Li, Fan Zhang, Huan Liu, Wei Hu, Beijing University of Chemical Technology, China*

**MOP.P1.4** Board 4 **IMPROVEMENT OF SCANSAR INTERFEROMETRIC PROCESSING**
*Masanori Miyawaki, NEC Aerospace Systems, Ltd., Japan; Tsunekazu Kimura, NEC Corporation, Japan*

**MOP.P1.5** Board 5 **CHANGE DETECTION WITH SPACEBORNE INSAR TECHNIQUE IN HONG KONG**
*Ling Lei, Daniele Perissin, Yuxiao Qin, The Chinese University of Hong Kong, Hong Kong SAR of China*

**MOP.P1.6** Board 6 **AN EFFICIENT GEOGRAPHY REGISTRATION METHOD FOR INSAR COHERENT CHANGE DETECTION**
*Wanjun Zhang, Shanghai Jiao Tong University, China; Hui Zhang, Beijing Aerospace Automatic Control Institute, China; Wei Wang, Shanghai Jiao Tong University, China; Yan Liu, Beijing Aerospace Automatic Control Institute, China; Yuanxiang Li, Wenxian Yu, Shanghai Jiao Tong University, China*

**MOP.P1.7** Board 7 **FLAT EARTH REMOVAL AND BASELINE ESTIMATION BASED ON ORBIT PARAMETERS USING RADARSAT-2 IMAGE**
*Yongxing Cao, Sichuan Electric Power Research Institute, China; Zhong Fan, Yan Chen, Mingquan Jia, Ling Tong, University of Electronic Science and Technology of China, China; Youchun Lu, China Centre for Resources Satellite Data and Application, China*

**MOP.P1.8** Board 8 **RETRIEVAL OF WAVE PARAMETERS FROM ERS-2 SAR IMAGERY IN SHALLOW OCEAN AREA**
*Tao Yue, Guoqing Zhou, Wei Zhao, Xiaodong Tao, Bo Yang, Jingjin Huang, Guilin University of Technology, China*



## Recent Advances in GNSS-R and Synthetic Aperture Microwave Radiometry

**MOP.P2.9** Board 9 **SOIL MOISTURE MAPPING USING FORWARD SCATTERED GPS L1 SIGNALS**
*Alberto Alonso-Arroyo, Giuseppe Forte, Adriano Camps, Hyuk Park, Daniel Pascual Biosca, Raul Onrubia Ibáñez, Roger Jové Casulleras, Universitat Politècnica de Catalunya (UPC) Barcelona-Tech and IEEC/UPC, Spain*

**MOP.P2.10** Board 10 **COMPARISON OF GPS L1 AND GALILEO E1 SIGNALS FOR GNSS-R OCEAN ALTIMETRY**
*Daniel Pascual Biosca, Hyuk Park, Adriano Camps, Alberto Alonso-Arroyo, Raul Onrubia, Universitat Politècnica de Catalunya (UPC), Spain*

**MOP.P2.11** Board 11 **IMPROVEMENT OF THE PAU/PARIS END-TO-END PERFORMANCE SIMULATOR (P2EPS) IN PREPARATION FOR UPCOMING GNSS-R MISSIONS**
*Hyuk Park, Adriano Camps, Daniel Pascual Biosca, Alberto Alonso-Arroyo, Francisco Martin, Hugo Carreno-Luengo, Universitat Politècnica de Catalunya (UPC), Spain*

**MOP.P2.12** Board 12 **A GNSS-R EXPERIMENT OVER WAVE CHANNEL SURFACE**
*Hugo Carreno-Luengo, Adriano Camps, Universitat Politècnica de Catalunya (UPC), Spain*

**MOP.P2.13** Board 13 **ALTIMETRY PERFORMANCE AND ERROR BUDGET OF THE PARIS IN-ORBIT DEMONSTRATION MISSION**
*Adriano Camps, Daniel Pascual Biosca, Hyuk Park, Francisco Martin, Universitat Politècnica de Catalunya (UPC), Spain; Antonio Rius, Serni Ribo, Institut de Ciències de l'Espai, ICE/IEEC-CSIC, Spain; Javier Benito, Ana Andrés, Paula Saameno, Astrium EADS-CASA Espacio, Spain; Gavin Staton, Kayser-Threde GmbH, Germany; Manuel Martín-Neira, Salvatore d'Addio, Philip Willemsen, European Space Agency / ESTEC, Netherlands*

**MOP.P2.14** Board 14 **FPIR: THE DUAL POLARIZATION ANTENNA**
*Jingye Yan, Ji Wu, Xiaocheng Yang, Hao Liu, Cheng Zhang, Guang Liu, Heguang Liu, Chinese Academy of Sciences, China*

**MOP.P2.15** Board 15 **QUANTITATIVE ANALYSIS OF DESIGN LIMITATIONS FOR SYNTHETIC APERTURE RADIOMETER**
*Xiaocheng Yang, Ji Wu, Jingye Yan, National Space Science Center, Chinese Academy of Sciences, China*

**MOP.P2.16** Board 16 **WIND SPEED MAPING FROM THE ISS USING GNSS-R? A SIMULATION STUDY**
*Adriano Camps, Hyuk Park, Alberto Alonso-Arroyo, Univeristat Politecnica de Catalunya, Spain*

## Microwave Radiometers

Session Co-Chairs: Andreas Colliander, NASA Jet Propulsion Laboratory; Adriano Camps, Universitat Politècnica de Catalunya

**MOP.P3.17** Board 17 **CALIBRATION AND VALIDATION OF THIRD STOKES PARAMETER MEASUREMENTS OF SMOS ZERO-BASELINE RADIOMETERS**
*Chun-Sik Chae, NASA Jet Propulsion Laboratory, United States; Juha Kainulainen, Aalto University, Finland; Andreas Colliander, NASA Jet Propulsion Laboratory, United States*

**MOP.P3.18** Board 18 **INTER-COMPARISON OF SMOS AND AQUARIUS BRIGHTNESS TEMPERATURES AT L-BAND OVER SELECTED TARGETS**
*Miriam Pablos Hernández, María Piles Guillem, Universitat Politècnica de Catalunya (UPC), Spain; Verónica González Gambau, Institut de Ciències del Mar CSIC, Spain; Mercè Vall-llossera Ferran, Adriano Camps, Universitat Politècnica de Catalunya (UPC), Spain*

**MOP.P3.19** Board 19 **DESIGN, POSITION ERROR ANALYSIS AND ADJUSTMENT OF ANTENNA ARRAY FOR GEOSTATIONARY INTERFEROMETRIC MICROWAVE SOUNDER**
*Weiying Sun, Hao Liu, Cheng Zhang, Shengwei Zhang, Ji Wu, National Space Science Center, Chinese Academy of Sciences, China*

**MOP.P3.20** Board 20 **A FINITE ELEMENT THERMAL SIMULATION OF A MICROWAVE BLACKBODY CALIBRATION TARGET**
*Derek Houtz, David Walker, National Institute of Standards and Technology, United States*

**MOP.P3.21** Board 21 **COMPARISON OF THE IN-ORBIT CALIBRATIONS BETWEEN THE MICROWAVE SOUNDERS ON NOAA AND FY-3 SATELLITES**
*Geng-Ming Jiang, Wei Zhou, Fudan University, China*

**MOP.P3.22** Board 22 **ON THE SENSITIVITY OF FIRE DETECTION BY A MICROWAVE RADIOMETER**
*Petr Dvorak, Stanislav Zvanovec, Czech Technical University in Prague, Czech Republic*

**MOP.P3.23** Board 23 **FPGA DESIGN AND REALIZATION OF GROUND TESTING EQUIPMENT BUS INTERFACE FOR MICROWAVE REMOTE SENSOR ON SATELLITE**
*Xiaohua Zhou, Yu Guo, Hao Li, Xi'an Institute of Space Radio Technology, China*



## Hyperspectral Techniques I

Session Co-Chairs: Francesca Bovolo, University of Trento; Liguo Wang, Harbin Engineering University

**MOP.P4.24** Board 24 **HYPERSPECTRAL BAND SELECTION FROM THE SPECTRAL SIMILARITY PERSPECTIVE**
*Shijin Li, Yuelong Zhu, Dingsheng Wan, Jun Feng, Hohai University, China*

**MOP.P4.25** Board 25 **NOVEL SIMILARITY MEASURE-BASED NONLINEAR DIMENSIONALITY REDUCTION METHODS FOR HYPERSPECTRAL IMGERY**
*Hanye Pu, Bin Wang, Fudan University, China*

**MOP.P4.26** Board 26 **A CW-SSIM DISTANCE MEASURE-BASED AFFINITY PROPAGATION FOR HYPERSPECTRAL BAND SELECTION**
*Sen Jia, Lin Deng, Shenzhen University, China*

**MOP.P4.27** Board 27 **HYPERSPECTRAL IMAGERY CLASSIFICATION BASED ON ROTATION INVARIANT SPECTRAL-SPATIAL FEATURE**
*Chao Tao, Jing Jin, Yuqi Tang, Zhengrong Zou, Central South University, China*

**MOP.P4.28** Board 28 **IMPROVING DETECTION USING A MATERIAL PATTERN MATCHING TECHNIQUE IN HYPERSPECTRAL IMAGES**
*Paul Dawson, Vittala Shettigara, Defence Science and Technology Organisation, Australia*

**MOP.P4.29** Board 29 **ISOMAP-BASED SUBSPACE ANALYSIS FOR THE CLASSIFICATION OF HYPERSPECTRAL DATA**
*Ling Ding, Ping Tang, Hongyi Li, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China*

**MOP.P4.30** Board 30 **SPARSE REPRESENTATION OF HYPERSPECTRAL DATA USING CUR MATRIX DECOMPOSITION**
*Jakob Sigurdsson, Magnus O. Ulfarsson, Johannes R. Sveinsson, Jon Atli Benediktsson, University Of Iceland, Iceland*

**MOP.P4.31** Board 31 **A ONE-CLASS CLASSIFICATION BY SPATIAL-CONTEXTUAL FOR REMOTELY SENSED IMAGE**
*Xiaofei Wang, Shuang Wu, Ye Zhang, Beijing Twenty-First Century Science & Technology Development Co. Ltd, China, China; Wang Aihua, Chuanlong Hou, Heilongjiang University, China*

**MOP.P4.32** Board 32 **A NONLINEAR REGRESSION CLASSIFICATION ALGORITHM WITH SMALL SAMPLE SET FOR HYPERSPECTRAL IMAGE**
*Jiayi Li, Hongyan Zhang, Liangpei Zhang, Wuhan University, China*

**MOP.P4.33** Board 33 **ENHANCEMENT OF HYPERSPECTRAL UNMIXING USING CONTINUUM REMOVAL**
*Yuki Itoh, Akira Iwasaki, The University of Tokyo, Japan*

**MOP.P4.34** Board 34 **GIF-BASED LEAST SQUARE METHOD FOR HYPERSPECTRAL AND MULTISPECTRAL DATA FUSION**
*Ying Zhang, Yanrong Cui, Binbin He, University of Electronic Science and Technology of China, China*

**MOP.P4.35** Board 35 **EFFECTS OF LEAF SURFACE WAX ON LEAF SPECTRUM AND HYPERSPECTRAL VEGETATION INDICES**
*Shan Lu, Northeast Normal University, China, China*

**MOP.P4.36** Board 36 **HYPERSPECTRAL IMAGE DENOISING USING A NEW LINEAR MODEL AND SPARSE REGULARIZATION**
*Behnood Rasti, Johannes R. Sveinsson, Magnus O. Ulfarsson, Jon Atli Benediktsson, University of Iceland, Iceland*

## Optical and Infrared Modelling I

Session Chair: Qingsheng Liu, Institute of Geographic Sciences and Natural Resources Research

**MOP.P5.37** Board 37 **TEMPORAL NORMALIZATION OF TERRA-MODIS LAND SURFACE TEMPERATURE PRODUCT**
*Si-Bo Duan, State Key Laboratory of Resources and Environment Information System, Institute of Geographic Sciences and Natural Resources Research, CAS, China; Zhao-Liang Li, Key Laboratory of Agri-informatics, Ministry of Agriculture / Institute of Agricultural Resources and Regional Planning, Chinese Academy of Agricultural Sciences, China; Hua Wu, Bo-Hui Tang, State Key Laboratory of Resources and Environment Information System, Institute of Geographic Sciences and Natural Resources Research, CAS, China*

**MOP.P5.38** Board 38 **PRELIMINARY EVALUATION OF LINEAR SPECTRAL EMISSIVITY CONSTRAINT TEMPERATURE AND EMISSIVITY SEPARATION METHOD FOR CONTRAST SAMPLES FROM HYPERSPECTRAL THERMAL INFRARED DATA**
*Yong-Gang Qian, Ning Wang, Caixia Gao, Yuan Yuan Jia, Lingling Ma, Academy of Opto-Electronics, Chinese Academy of Sciences, China; Hua Wu, Institute of Geographical Sciences and Natural Resources Research, Chinese Academy of Sciences, China; Zhao-Liang Li, University of Strasbourg, China; Lingli Tang, Academy of Opto-Electronics, Chinese Academy of Sciences, China*

**MOP.P5.39** Board 39 **A NEURAL NETWORK BASED METHOD FOR LAND SURFACE TEMPERATURE RETRIEVAL FROM AMSR-E PASSIVE MICROWAVE DATA**
*Caixia Gao, Academy of Opto-Electronics, Chinese Academy of Sciences, China; Xiaoguang Jiang, University of Chinese Academy of Sciences, China; Yong-Gang Qian, Academy of Opto-Electronics, Chinese Academy of Sciences, China; Shi Qiu, ICube, UdS, CNRS, Bld Sebastien Brant, 67412, Illkirch, France, France; Lingling Ma, Academy of Opto-Electronics, Chinese Academy of Sciences, China; Zhao-Liang Li, ICube, UdS, CNRS, Bld Sebastien Brant, 67412, Illkirch, France, France*

**MOP.P5.40** Board 40 **TIME SERIES EVAPOTRANSPIRATION ESTIMATION BASED ON MODIS/TERRA SATELLITE DATA OVER SOUTH ASIA**
*Wei Zhao, Ainong Li, Wei Deng, Institute of Mountain Hazards and Environment, Chinese Academy of Sciences, China*

**MOP.P5.41** Board 41 **THE STUDY ON THE METHOD TO SIMULATE THE RADIATION OF HYBRID SCENE AT PIXEL SCALE BASED ON IMPROVING KUUSK MODEL**
*Jinling Song, Beijing Normal University, China*

**MOP.P5.42** Board 42 **ESTIMATION OF NET SURFACE LONGWAVE RADIATION FOR THE TIBETAN PLATEAU REGION USING MODIS DATA**
*Jiao Wang, Xiao-Yu Zhang, School of Environment and Resources, Shanxi University, China; Bo-Hui Tang, Hua Wu, State Key Laboratory of Resources and Environmental information System, Institute of Geographic Sciences and Natural Resources Research, CAS, China; Zhao-Liang Li, Key Laboratory of Agri-informatics, Ministry of Agriculture / Institute of Agricultural Resources and Regional Planning, Chinese Academy of Agricultural Sciences/ LSIIT, UdS, CNRS, China*

**MOP.P5.43** Board 43 **ESTIMATION OF MAIZE LAI BY ASSIMILATING REMOTE SENSING DATA INTO CROP MODEL**
*Xiaohua Zhu, Lingling Ma, Chuan-Rong Li, Lingli Tang, Bo Zhu, Academy of Opto-Electronics, Chinese Academy of Sciences, China*

**MOP.P5.44** Board 44 **SPATIAL SCALE ISSUE IN TEMPERATURE AND EMISSIVITY SEPARATION FROM THERMAL HYPERSPECTRAL IMAGER**
*Yang Hang, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China; Huang Zhaoqiang, Institute of Mineral Resources, China Metallurgical Geology Bureau, China; Zhang Lifu, Tong Qingxi, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China*



## Integrated Earth Observing Systems I

**MOP.P7.45** Board 45 **MULTI-SCALE OBSERVATION MATRIX OVER HETEROGENEOUS LAND SURFACES FOR VERIFYING REMOTE SENSING RESULTS**
*Jinxin Zhuang, Weizhen Wang, Jiemin Wang, Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences, China*

## High Resolution Optical Techniques III

Session Co-Chairs: Nathan Longbotham, University of Colorado at Boulder; Giona Matasci, University of Lausanne

**MOP.P8.46** Board 46 **EFFECTS OF POINT DENSITY ON THE DEM ACCURACY OF AIRBORNE LIDAR**
*Yafei Jia, Tian Lan, Tao Peng, Hongbo Wu, Cuiling Li, Guoqiang Ni, Beijing Institue of Technology, China*

**MOP.P8.47** Board 47 **IMAGE RESTORATION BASED ON KALMAN FILTER**
*Bingxian Zhang, Mi Wang, Jun Pan, Wuhan University, China*

**MOP.P8.48** Board 48 **LONG TERM SOIL PRODUCTIVITY STUDY USING VERY HIGH SPATIAL RESOLUTION IMAGERY**
*Kongwen Zhang, Selkirk College, Canada; Mike Curran, BC Ministry of Forests, Canada; Justin Robinson, Selkirk College, Canada; Baoxin Hu, York University, Canada*

**MOP.P8.49** Board 49 **THE CHARACTERIZATION OF DIGITAL SURFACE MODEL FROM STEREO IMAGERY OVER VEGETATED AREAS**
*Wenjian Ni, Zhiyu Zhang, Zhifeng Guo, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China; Guoqing Sun, University of Maryland, College Park, United States*

**MOP.P8.50** Board 50 **PATCH BASED MULTI-INSTANCE LEARNING FOR COMPLEX STRUCTURE RECOGNITION IN VERY HIGH-RESOLUTION IMAGERY**
*Ranga Raju Vatsavai, Budhendra Bhaduri, Oak Ridge National Laboratory, United States; Jordan Graesser, McGill University, Canada*

**MOP.P8.51** Board 51 **BUILDING DETECTION IN HIGH RESOLUTION SATELLITE URBAN IMAGE USING SEGMENTATION, CORNER DETECTION COMBINED WITH ADAPTIVE WINDOWED HOUGH TRANSFORM**
*Mi Wang, Shenggu Yuan, Jun Pan, Wuhan University, China*



## Instruments, Calibration and Techniques

Session Co-Chairs: Toru Kouyama, National Institute of Advanced Industrial Science and Technology; Vince Salomonson, University of Utah

**MOP.P9.52** Board 52 **USABILITY OF LUNAR REFLECTANCE MODEL BASED ON SELENE/SP FOR PLANNED HISUI RADIOMETRIC CALIBRATION**
*Toru Kouyama, Yoshiaki Ishihara, Ryosuke Nakamura, Satoshi Tsuchida, National Institute of Advanced Industrial Science and Technology, Japan; Tsuneo Matsunaga, National Institute for Environmental Studies, Japan; Fumihiro Sakuma, Japan Space Systems, Japan; Yasuhiro Yokota, National Institute for Environmental Studies, Japan; Hirokazu Yamamoto, National Institute of Advanced Industrial Science and Technology, Japan; Satoru Yamamoto, National Institute for Environmental Studies, Japan*

**MOP.P9.53** Board 53 **AN OPTIMIZED ACQUISITION ALGORITHM IN GPS SOFTWARE RECEIVER**
*Shaolong Cui, Institute of Computing Technology, Chinese Academy of Sciences, China; Xiangzhen Yao, China Electronics Standardization Institute, China; Qiang Qiu, Jinyun Fang, Institute of Computing Technology, Chinese Academy of Sciences, China*

**MOP.P9.54** Board 54 **VIIRS ON-ORBIT CALIBRATION ACTIVITIES AND PERFORMANCE**
*Xiaoxiong Xiong, NASA Goddard Space Flight Center, United States; Hassan Oudrari, Kwofu Chiang, Jeffrey McIntire, Jon Fulbright, Ning Lei, Junqiang Sun, Boryana Efremova, Zhipeng Wang, Sigma Space Corporation, United States; James Butler, NASA Goddard Space Flight Center, United States*

## Lidar Applications

Session Co-Chairs: Michael Cathcart, Georgia Institute of Technology; David Kunkee, The Aerospace Corporation

**MOP.P11.55 SIMULATION STUDY OF NEW GENERATION OF AIRBORNE**
Board 55 **SCANNERLESS LIDAR SYSTEM**
*Guoqing Zhou, Bo Yang, Guilin University of Technology, China; Wuming Zhang, Beijing Normal University, China; Xiaodong Tao, Wei Zhao, Tao Yue, Xiang Zhou, Chuntao Yang, Guilin University of Technology, China*

**MOP.P11.56 FINE-SCALE 3D BIOTOPE MAPPING USING ULTRA HIGH**
Board 56 **RESOLUTION AIRBORNE PHOTOGRAPHY AND MOBILE LASER SCANNING**
*Yi Lin, Peking University, China; Juha Hyyppä, Finnish Geodetic Institute, Finland; Miao Jiang, China Metallurgical Geology Bureau, China*

**MOP.P11.57 ANALYSIS ON THE INVERSION ACCURACY OF LAI BASED**
Board 57 **ON SIMULATED POINT CLOUDS OF TERRESTRIAL LIDAR OF TREE BY RAY TRACING ALGORITHM**
*Yan Wang, Donghui Xie, Guangjian Yan, Wuming Zhang, Xihan Mu, Beijing Normal University, China*

**MOP.P11.58 THE AUTOMATIC TREE DETECTION AND DELINEATION FROM**
Board 58 **AIRBORNE LIDAR**
*Haibing Xiang, Chunxiang Cao, State Key Laboratory of Remote Sensing Science, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China; Jinsong Liu, Hebei Key Laboratory of Mathematic Calculation and Application, China; Wei Zhou, reservoir department of State Council Three Gorges Project Construction Committee Executive Office, China*



## Remote Sensing from Airborne Platforms

Session Chair: Austin Jensen, Utah State University

**MOP.P14.59 A REALTIME METHOD FOR EVALUATE AERIAL REMOTE**
Board 59 **SENSING TASK**
*Lei Feng, Chaoliang Wang, Bo Zhu, Academy of Opto-Electronics, Chinese Academy of Sciences, China*

**MOP.P14.60 CALIBRATING THERMAL IMAGERY FROM AN UNMANNED**
Board 60 **AERIAL SYSTEM- AGGIEAIR**
*Austin M. Jensen, Utah State University, United States; Mac McKee, Utah Water Research Laboratory, United States; YangQuan Chen, University of California, Merced, United States*

**MOP.P14.61 MATCHING UAV IMAGES WITH IMAGE TOPOLOGY**
Board 61 **SKELETON**
*Zhihua Xu, Lixin Wu, Beijing Normal University, China; Zhi Wang, College of Resources and Civil Engineering, China; Ran Wang, China University of Mining and Technology, China; Zhifeng Li, Beijing Normal University, China; Fashuai Li, China University of Mining and Technology, China*

## Precipitation and Clouds I

Session Co-Chairs: Chinnawat Surussavadee, Prince of Songkla University, Phuket Campus; Delbert Willie, Colorado State University

**MOP.P15.62 A NEW CLOUD DETECTION METHOD OVER TIBETAN**
Board 62 **PLATEAU AND ITS SURROUNDING AREA**
*Shanlong Wu, Chongqing University of Posts and Telecomunications, China; Bo Zhong, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China; Weisheng Li, Chongqing University of Posts and Telecomunications, China; Qinhuo Liu, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China*

**MOP.P15.63 RELATION BETWEEN CUMULONIMBUS(CB) PREICITIATION**
Board 63 **AND CLOUD DYNAMICAL FEATURES OVER HUAIHE RIVER BASIN OF CHINA BASED ON FY-2C IMAGE**
*Yu Liu, Zhao-Liang Li, Chinese Academy of Sciences, China; Chunxiang Shi, Chinese Meteorological Administration, China; Bo-Hui Tang, Hua Wu, Qingsheng Liu, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, China*

**MOP.P15.64 RETRIEVAL OF MESOSCALE ATMOSPHERIC MOTION**
Board 64 **VECTORS USING COMS IMAGES AT KMA/NIMR**
*Somyoung Kim, Mi-Lim Ou, Korea Meteorological Administration/National Institution of Meteorological Research, Republic of Korea*

**MOP.P15.65 A SENSOR-BASED SCHEME FOR ASSESSING CLOUD**
Board 65 **COVERAGE IN HJ-1 CCD DATA**
*Dacheng Li, Ping Tang, Chinese Academy of Sciences, China*

**MOP.P15.66 THE IMPACT OF VERTICAL WIND SHEAR ON THE**
Board 66 **HURRICANE EYE TILT AT THE SEA AND CLOUD LEVELS**
*Xuezhu Lv, Ocean University of China, China; Xiaofeng Li, Global Science and Technology at NOAA, United States; Xiaofeng Yang, Chinese Academy of Sciences, China; William Pichel, National Oceanic and Atmospheric Administration, United States; Xuan Zhou, P. O. Box 5111, China; Yuguang Liu, Ocean University of China, China*

**MOP.P15.67 PRECIPITATION ANALYSIS BY X-BAND MP RADAR DATA**
Board 67 **USING GOOGLE EARTH**
*Masahiro Nishio, Masatoshi Mori, Kinki University, Japan*



## Numerical Weather Prediction and Data Assimilation I

Session Co-Chairs: John LeMarshall, Bureau of Meteorology, Australia; Sandra Cruz-Pol, University of Puerto Rico at Mayaguez

**MOP.P16.68 FLOOD ALERT SYSTEM USING RAINFALL FORECAST DATA IN**
Board 68 **WESTERN PUERTO RICO**
*Luz Torres, Eric Harmsen, Sandra Cruz-Pol, University of Puerto Rico, Mayaguez Campus, Puerto Rico*

**MOP.P16.69 THE URBAN EFFECT ON CLIMATE CHANGES IN**
Board 69 **BEIJING-TIANJIN-TNAGSHAN (BTT) REGIONS OVER CHINA**
*Lei Jiang, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China; Lixin Lu, Colorado State University, United States; Lingmei Jiang, Beijing Normal University, China; Gengjun Zhang, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China*

**MOP.P16.70 TOWARDS A KALMAN FILTER BASED LAND SURFACE DATA**
Board 70 **ASSIMILATION SCHEME FOR ACCESS**
*Imtiaz Dharssi, Peter Steinle, The Centre for Australian Weather and Climate Research, Australia; Brett Candy, UK Met Office, United Kingdom*

## Atmospheric Sounding

Session Co-Chairs: William Blackwell, MIT Lincoln Laboratory; Steven C. Reising, Colorado State University

**MOP.P17.71 ROBUSTLY RETRIEVING AEROSOL OPTICAL DEPTH OVER LAND FROM MODIS DATA**
Board 71
*Guanghui Huang, Weizhen Wang, Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences, China; Zhengqiang Li, State Environmental Protection Key Laboratory of Satellite Remote Sensing, IRSA, CAS, China; Chunlin Huang, Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences, China*

**MOP.P17.72 AEROSOL OPTICAL THICKNESS RETRIEVAL OVER SNOW-COVERED SURFACE USING AATSR DATA**
Board 72
*Linlu Mei, Yong Xue, XingWei He, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*



## Aerosols and Atmospheric Chemistry I

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*Zhongting Wang, Qing Li, Chunyan Zhou, Lijuan Zhang, Huiqin Mao, Hui Chen, Wandong Ma, Satellite Environment Center, Ministry of Environmental Protection, China*

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*Iván Villalón-Turrubiates, ITESO, Universidad Jesuita de Guadalajara, Mexico; Gloria Faus-Landeros, Universidad de Guadalajara, Mexico; Edward Celarier, NASA Goddard Space Flight Center, United States*

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*Xingwei He, Yong Xue, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China; Jie Guang, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China; Leiku Yang, Linlu Mei, Jia Liu, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

### Data Management and Systems I

Session Chair: Liping Di, George Mason University

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*Jian Liu, Xiangtao Fan, Lin Chen, Lajiao Chen, Center for Earth Observation and Digital Earth, Chinese Academy of Sciences, China*

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*Chaker El Amrani, Abdelmalek Essaadi University, Morocco; Gilbert L. Rochon, Tuskegee University, United States; Tarek El-Ghazawi, George Washington University, United States; Gülay Altay, Bogaziçi University, Turkey; Tajeddine Rachidi, Al Akhawayn University, Morocco*

**MOP.P19.78 AN ADAPTIVE HIERARCHICAL CACHING SCHEME FOR**
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*Yunqin Zhong, Jizhong Han, Jinyun Fang, Institute of Computing Technology, Chinese Academy of Sciences, China*



### Inland Waters I

Session Chair: Charles Luther, Retired

**MOP.P20.79 MAPPING SATELLITE-1 IMAGE FUSION AND EVALUATION**
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*He Huang, Yi Feng, YaFei Hu, Meng Zhang, MingTao Li, Beijing University of Civil Engineering and Architecture, China*

**MOP.P20.80 AN EFFICIENT HIERARCHICAL DATA PLACEMENT**
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*Fubiao Xi, Chengqi Cheng, Dong Chen, Fang Dong, Peking University, China*

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Session Chair: Andreas Raigber, German Aerospace Center (DLR)

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*John P. Kerekes, Jiashu Zhang, Adam Goodenough, Scott Brown, Rochester Institute of Technology, United States*

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*Muhammad Shahzad, Technical University Munich TUM, Germany, Germany; Xiao Xiang Zhu, German Aerospace Center (DLR), Germany*



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*Liechen Li, Daojing Li, Institute of Electronics, Chinese Academy of Sciences, China*

**MOP.P22.85 A FAST METHOD FOR COMPRESSIVE SENSING SAR**
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*Peng Xiao, Ze Yu, Chun-Sheng Li, Beihang University, China; Yongqiang Zhang, Beijing Institute of Tracking and Telecommunication Technology, China*

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*Chunhui Pan, umd, United States; Xiangqian Wu, L. Flynn, M. Grotenhuis, F. Weng, National Oceanic and Atmospheric Administration, United States*

**MOP.P23.87 NPP VIIRS LAND SURFACE TEMPERATURE PRODUCT VALIDATION USING WORLDWIDE OBSERVATION NETWORKS**
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*Pierre Guillevic, Cooperative Institute for Climate and Satellites, NCSU, United States; Jeffrey Privette, National Oceanic and Atmospheric Administration / NCDC, United States; Yunyue Yu, National Oceanic and Atmospheric Administration / STAR, United States; Frank Goettsche, Karlsruhe Institute of Technology, Germany; Glynn Hulley, NASA Jet Propulsion Laboratory, United States; Albert Olioso, INRA, France; José Sobrino, University of Valencia, Spain; Tilden Meyers, National Oceanic and Atmospheric Administration / ATDD, United States; Darren Ghent, University of Leicester, United Kingdom; Annika Bork-Unkelbach, Karlsruhe Institute of Technology, Germany; Dominique Courault, INRA, France; Miguel Roman, NASA Goddard Space Flight Center, United States; Simon Hook, NASA Jet Propulsion Laboratory, United States; Ivan Csiszar, National Oceanic and Atmospheric Administration / STAR, United States*

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Session Chair: Jie Chen, Beihang University

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*De-Yi Zou, Jie Chen, Peng-Bo Wang, Yan-Qing Zhu, Wei Yang, Beihang University, China*

**TUP.P1.2** Board 2 **A REFINED GEOMETRIC CORRECTION ALGORITHM FOR SPOTLIGHT AND SLIDING SPOTLIGHT SPACEBORNE SAR**
*Zhi-Rong Men, Peng-Bo Wang, Chun-Sheng Li, Beihang University, China; Zhong-Ma Cui, Beijing Institute of Remote Sensing Equipment, China; Xian-Zhong Wen, Shuang Li, Beihang University, China*

**TUP.P1.3** Board 3 **A NEW MTF-BASED IMAGE QUALITY ASSESSMENT FOR HIGH-RESOLUTION SAR SENSORS**
*Xin Lin, Kaizhi Wang, Xingzhao Liu, Jianjun Li, Shanghai Jiao Tong University, China*

**TUP.P1.4** Board 4 **RADIOMETRIC-SPATIAL ANALYSIS FOR SHIP DETECTION IN HIGH RESOLUTION SYNTHETIC APERTURE RADAR IMAGES**
*Wei Wang, Bin Liu, Hao Hu, Shanghai Jiao Tong University, China; Hui Zhang, Yan Liu, Beijing Aerospace Automatic Control Institute, China; Wenxian Yu, Shanghai Jiao Tong University, China*

**TUP.P1.5** Board 5 **MULTI-SPOTLIGHT BALLOON SAR: AN INTERESTING MICROWAVE REMOTE SENSING MISSION FOR DISTRIBUTED MONITORING**
*Haiguang Yang, Long Teng, Yulin Huang, Jianyu Yang, Xiaobo Yang, University of Electronic Science and Technology of China, China*

**TUP.P1.6** Board 6 **ULTRA WIDE SWATH SAR BASED ON WAVEFORM DIVERSITY**
*Yan Zhang, Ze Yu, Chun-Sheng Li, Beihang University, China*

**TUP.P1.7** Board 7 **THE ALGORITHM OF BUILDING AREA EXTRACTION BASED ON BOUNDARY PRIOR AND CONDITIONAL RANDOM FIELD FOR SAR IMAGE**
*Chu He, Bo Shi, Yu Zhang, School of Electronic Information, Wuhan University, China; Xin Su, Institution Telecom, Telecom Paris, France; Wen Yang, Xin Xu, School of Electronic Information, Wuhan University, China*



## SAR Processing I

Session Chair: Nick Stacy, Defence Science and Technology Organisation (DSTO)

**TUP.P2.8** Board 8 **AZIMUTH AMBIGUITY SUPPRESSION FOR SPACEBORNE SAR BASED ON PRF MICRO-VARIATION**
*Min Liu, Ze Yu, Chun-Sheng Li, Beihang University, China*

**TUP.P2.9** Board 9 **USING GPS BUOY TO VERIFY SWH AND AP OF SAR INVERSION**
*Jingjin Huang, Guoqing Zhou, Tao Yue, Wei Zhao, Xiaodong Tao, Bo Yang, Guilin University of Technology, China*

**TUP.P2.10** Board 10 **SIGNAL PROPERTIES OF TOPS-BASED NEAR SPACE SLOW-SPEED SAR**
*Wenchao Li, Jianyu Yang, Yulin Huang, Haiguang Yang, Qianghui Zhang, Zhe Liu, Junjie Wu, University of Electronic Science and Technology of China, China*

**TUP.P2.11** Board 11 **EFFECTS OF PRF VARIATION ON SPACEBORNE SAR IMAGING**
*Yan Zhang, Ze Yu, Chun-Sheng Li, Beihang University, China*

**TUP.P2.12** Board 12 **A GENERALIZED METHOD OF SYNTHETIC APERTURE RADAR ECHO SIMULATION BASED ON THE THEORY OF ELECTROMAGNETIC SCATTERING**
*Peng Lin, Ze Yu, Chun-Sheng Li, Beihang University, China*

**TUP.P2.13** Board 13 **GROUND MOVING TARGET INDICATION IN SAR IMAGES BASED ON LOCAL 2-LOOK SIMILARITY**
*Tianyi Zhan, Junfeng Wang, Xingzhao Liu, Wentao Lv, Shanghai Jiao Tong University, China*

**TUP.P2.14** Board 14 **SIMULATION STUDY ON SAR IMAGING SPECTRUM OF SHALLOW WATER AREA USING TEXEL-MARSEN-ARSLOE SPECTRUM**
*Guoqing Zhou, Tao Yue, Wei Zhao, Xiaodong Tao, Bo Yang, Jingjin Huang, Guilin University of Technology, China*

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**TUP.P3.15** Board 15 **INSAR DEFORMATION TIME SERIES ANALYSIS USING SMALL-BASELINE APPROACH**
*Yongsheng Li, Jingfa Zhang, Yi Luo, Lixia Gong, China Earthquake Administration, China*

**TUP.P3.16** Board 16 **COHERENCE BASED ANALYSIS OF DISTRIBUTED SCATTERERS IN THE QINGHAI-TIBET PLATEAU**
*Panpan Tang, Zhen Li, Jianmin Zhou, Bangsen Tian, Juan Xu, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

**TUP.P3.17** Board 17 **ANALYSIS OF ARTIFICIAL CORNER REFLECTOR'S RADAR CROSS SECTION ON SAR IMAGES AND ITS APPLICATION IN DEFORMATION MONITORING**
*Guifang Zhang, Xinjian Shan, Institute of Geology, China Earthquake Administration, China*



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Session Chair: Xiaolan Xu, NASA Jet Propulsion Laboratory

**TUP.P4.18** Board 18 **A NEW DIELECTRIC MODEL FOR VEGETATION IN FROZEN ENVIRONMENT – PART ΣVALIDATION SECTION**
*Fengmin Wu, Linna Chai, Lixin Zhang, Shaojie Zhao, Xiaokang Kou, Juntao Yang, Beijing Normal University, China*

**TUP.P4.19** Board 19 **A HYBRID METHOD TO CALCULATE THE COMPOSITE ELECTROMAGNETIC SCATTERING FROM A TARGET ABOVE A ROUGH SURFACE**
*Shuirong Chai, Lixin Guo, Yiwen Wei, Rui Wang, Xidian University, China*

**TUP.P4.20** Board 20 **A NEW SEMI-DETERMINISTIC FACET MODEL FOR ELECTROMAGNETIC SCATTERING FROM OCEAN-LIKE SURFACE**
*Yiwen Wei, Lixin Guo, Shuirong Chai, Anqi Wang, Xidian University, China*

**TUP.P4.21** Board 21 **CALIBRATING AND EVALUATING BACKSCATTERING MODELS FOR GROWING CORN**
*Alejandro Monsivais-Huertero, National Polytechnic Institute, Mexico; Pang-Wei Liu, Jasmeet Judge, University of Florida, United States*

**TUP.P4.22** Board 22 **A TARGET DETECTION METHOD WITH ECHO ACCUMULATION BASED ON EMD OF CARRIER-FREE UWB RADAR**
*Zhang Shunsheng, Cao Wenchen, Wu Xiu, University of Electronic Science and Technology of China, China*

**TUP.P4.23** Board 23 **DETERMINING THE COMPLEX PERMITTIVITY OF POWDER MATERIALS FROM 1-40GHZ USING TRANSMISSION-LINE TECHNIQUE**
*Ling Tong, Haihui Zha, Yu Tian, University of Electronic Science and Technology of China, China*

**TUP.P4.24** Board 24 **POLARIMETRIC RCS MEASUREMENTS OF BUILDING INTERIOR MATERIALS FOR ASSESSMENT OF Y-BAND RADAR SENSOR FOR INDOOR COLLISION AVOIDANCE AND NAVIGATION**
*Meysam Moallem, Kamal Sarabandi, The University of Michigan, United States*

**TUP.P4.25** Board 25 **SPACE-BASED PASSIVE RADAR SYSTEM PERFORMANCE ESTIMATION BY CHINASAT-9 BROADCAST SATELLITE**
*Wei Jin, Xiaode Lu, Mao-sheng Xiang, Liangjiang Zhou, Institute of Electronics, Chinese Academy of Sciences, China*

**TUP.P4.26** Board 26 **DESIGN AND OPERATION SIMULATION OF MAGNETIC SENSOR FOR MEASUREMENTS OF ALTERNATING MAGNETIC FIELD**
*Igor Shirokov, Elena Redkina, Sevastopol National Technical University, Ukraine*

**TUP.P4.27** Board 27 **AN ERROR CALIBRATION METHOD BASED ON BPANN ALGORITHM FOR THREE-AXIS MAGNETOMETERS**
*Lei Jiang, Ziqi Guo, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China; Baogang Zhang, Beijing Normal University, China*

## Subsurface Sensing Methods and Systems

Session Chair: Keith Morrison, Cranfield University

**TUP.P5.28** Board 28 **ADVANCED GPR FOR ARCHAEOLOGICAL SURVEY**
*Motoyuki Sato, Tohoku University, Japan; Kyoji Doi, Mitsui Engineering and Shipbuilding, Japan; Kazunori Takahashi, Tohoku University, Japan*

**TUP.P5.29** Board 29 **RECONSTRUCTION OF OBJECTS FROM ANTENNA AND PULSE REPLACED TIME DOMAIN DATA**
*Hui Zhou, Dongling Qiu, Ying Wang, China University of Petroleum, China*

**TUP.P5.30** Board 30 **SURFACE RECONSTRUCTION FROM SHIP TRACK DATA USING A RECURSIVE METHOD**
*Julien Doumergue, Wilfredo Salazar, Christian Gout, Erik Lenglart, INSA Rouen, France*

**TUP.P5.31** Board 31 **BACKPROJECTION ALGORITHM FOR SUBSURFACE RADAR IMAGING: COMPUTING THE ROUND-TRIP TIME DELAY**
*Angel Ribalta, Maria A. Gonzalez-Huici, Fraunhofer Institute for High Frequency Physics and Radar Techniques FHR, Germany*

**TUP.P5.32** Board 32 **OPTIMAL COILS WITH ZERO MUTUAL INDUCTANCE FOR ELECTROMAGNETIC INDUCTION SYSTEMS**
*Mark Reed, Waymond Scott, Georgia Institute of Technology, United States*

**TUP.P5.33** Board 33 **STUDY OF ACCURATE OCEAN-ALTIMETRY WITH GNSS-R**
*Yun Zhang, Fengling Liu, Qiming Gu, Wanting Meng, Zhonghua Hong, Yanling Han, Shanghai Ocean University, China*

**TUP.P5.34** Board 34 **SIMPLE CALIBRATION OF GEOPHONES USING AN AUDIO SOURCE**
*Antonio Gonzalez-Fernandez, Viridiana Herrera-Juarez, Luis Carlos Gradilla-Martinez, Centro de Investigacion Cientifica y de Educacion Superior de Ensenada, Mexico*

**TUP.P5.35** Board 35 **TECHNIQUES OF MODELING SPATIAL PHENOMENA OF BACKGROUND RADIATION IN TERRAIN GEOMETRIC CLUTTERING**
*Sam Nwaneri, Jaclyn P. Kuzniar, Jemia Whatley, Alcorn State University, United States*

**TUP.P5.36** Board 36 **FAST GPR UNDERGROUND SHAPE ANOMALY DETECTION USING THE SEMI-ANALYTIC MODE MATCHING (SAMM) ALGORITHM**
*Ann Morgenthaler, Carey Rappaport, Northeastern University, United States*

**TUP.P5.37** Board 37 **A CIRCULAR MEASUREMENT FOR LINEARLY POLARIZED GROUND PENETRATING RADAR TO MAP SUBSURFACE CROSSING CYLINDERS**
*Shiping Zhu, Jian Wang, Yu Li, Yi Su, National University of Defense Technology, China; Motoyuki Sato, Tohoku University, Japan*



## Hyperspectral Techniques II

Session Co-Chairs: Alina Zare, University of Missouri; Ryuei Nishii, Kyushu University

**TUP.P6.38** Board 38 **FEATURE EXTRACTION FOR HYPERSPECTRAL DATA BASED ON MNF AND SINGULAR VALUE DECOMPOSITION**
*Jun-Zheng Wu, Wei-Dong Yan, Wei-Ping Ni, Hui Bian, Northwest Institute of Nuclear Technology, China*

**TUP.P6.39** Board 39 **HYPERSPECTRAL IMAGE CLASSIFICATION USING PRIMAL LAPLACIAN SVM IN PRECONDITIONED CONJUGATE GRADIENT SOLUTION**
*Xiaoli Ma, Wang Cheng, Zhuo Sun, Chenglu Wen, Jonathan Li, School of Information Science and Engineering, Xiamen University, China*

**TUP.P6.40** Board 40 **PARALLEL OPTIMIZATION OF HYPERSPECTRAL UNMIXING BASED ON SPARSITY CONSTRAINED NONNEGATIVE MATRIX FACTORIZATION**
*Zebin Wu, Shun Ye, Jie Wei, Jianjun Liu, Zhihui Wei, Le Sun, Nanjing University of Science and Technology, China*

**TUP.P6.41** Board 41 **CONSTRUCTION OF SPARSE BASIS BY DICTIONARY TRAINING FOR COMPRESSIVE SENSING HYPERSPECTRAL IMAGING**
*Chuan-Rong Li, Lingling Ma, Qi Wang, Yong-sheng Zhou, Ning Wang, Academy of Opto-Electronics, Chinese Academy of Sciences, China*

**TUP.P6.42** Board 42 **PARALLEL SPARSE UNMIXING OF HYPERSPECTRAL DATA**
*Jose Alves, Jose Nascimento, Jose Bioucas-Dias, Instituto de Telecomunicações, Portugal; Antonio J. Plaza, University of Extremadura, Spain; Vitor Silva, Instituto de Telecomunicações, Portugal*

**TUP.P6.43** Board 43 **HYPERSPECTRAL DATA UNMIXING USING GNMF METHOD AND SPARSENESS CONSTRAINT**
*Roozbeh Rajabi, Hassan Ghassemian, Tarbiat Modares University, Iran*

**TUP.P6.44** Board 44 **REAL-TIME PROGRESSIVE BAND PROCESSING OF MODIFIED FULLY ABUNDANCE-CONSTRAINED SPECTRAL UNMIXING**
*Guan-Sheng Huang, Chao-Cheng Wu, National Taipei University of Technology, Taiwan; Keng-Hao Liu, Sinica Academia, Taiwan; Chein-I Chang, University of Maryland, Baltimore County, United States*

**TUP.P6.45** Board 45 **SPECTRAL-SPATIAL CLASSIFICATION BASED ON INTEGRATED SEGMENTATION**
*Pedram Ghamisi, University of Iceland, Iceland; Micael S. Couceiro, University of Coimbra, Portugal; Mathieu Fauvel, INP Toulouse, France; Jon Atli Benediktsson, University of Iceland, Iceland*

**TUP.P6.46** Board 46 **ENDMEMBER DETECTION USING GRAPH THEORY**
*Neda Rohani, Mario Parente, Arun Saranathan, University of Massachusetts Amherst, United States*

**TUP.P6.47** Board 47 **A POI-PRESERVING-BASED COMPRESSION METHOD FOR HYPERSPECTRAL IMAGE**
*Cuiping Shi, Junping Zhang, Ye Zhang, Hao Chen, Harbin Institute of Technology, China*

**TUP.P6.48** Board 48 **REDUCING HYPERSPECTRAL DATA DIMENSIONALITY USING RANDOM FOREST BASED WRAPPERS**
*Nitesh Poona, Stellenbosch University, South Africa; Riyad Ismail, University of KwaZulu-Natal, South Africa*

**TUP.P6.49** Board 49 **SEMI-SUPERVISED HYPERSPECTRAL BAND SELECTION VIA SPARSE LINEAR REGRESSION AND HYPERGRAPH MODELS**
*Zhouxiao Guo, Haichuan Yang, Xiao Bai, Beihang University, China; Zhihong Zhang, Xiamen University, China; Jun Zhou, Griffith University, Australia*

**TUP.P6.50** Board 50 **IMPROVED PRINCIPAL COMPONENT ANALYSIS BASED HYPERSPECTRAL IMAGE COMPRESSION METHOD**
*Baisen Liu, Heilongjiang Institute of Technology, China; Ye Zhang, Harbin Institute of Technology, China; Wulin Zhang, Harbin Engineering University, China*

**TUP.P6.51** Board 51 **AN AUTOMATIC ACCURACY EVALUATION APPROACH OF BAND REGISTRATION FOR MULTI-SPECTRAL IMAGERY**
*Ying Zhu, Mi Wang, Jun Pan, Wuhan University, China*

**TUP.P6.52** Board 52 **SUBSPACE CLUSTERING BASED ON DECISION FUSION STRATEGY FOR HYPERSPECTRAL IMAGERY**
*Hongzan Jiao, Yanfei Zhong, Liangpei Zhang, Pingxiang Li, Wuhan University, China*

**TUP.P6.53** Board 53 **CANONICAL CORRELATION ANALYSIS BASED FUSION OF INFRARED AND THERMAL INFRARED DATA**
*Prashanth Reddy Marpu, Michele Lazzarini, Hosni Ghedira, Taha Bmj Ouarda, Masdar Institute of Science and Technology, United Arab Emirates*

### Information Extraction for Mapping Applications

Session Co-Chairs: Krzysztof Koperski, DigitalGlobe, Inc.; Stefan Uhlmann, Tampere University of Technology

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**SAR IMAGE AUTOMATED DETECTION OF DUNE AREA**
*Christophe Gouinaud, Atteib Ibrahim Doutoum, Pascale Gouinaud, Mamadou Kaba Traore, Clermont University, France*

**TUP.P7.55** Board 55
**URBAN HEAT ISLAND MONITORING AND ANALYSIS BASED ON REMOTELY SENSED DATA**
*Ya Ma, Aimin Liu, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, China; Tianxing Wang, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China; Gaodi Xie, Mingyang Zhao, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, China*

**TUP.P7.56** Board 56
**OBJECT-ORIENTED CLUSTERING OF VHR PANCHROMATIC IMAGES USING A NONPARAMETRIC BAYESIAN MODEL EMBEDED WITH A LATENT SCENE**
*Yang Shu, Hong Tang, Jing Li, Jianwei Yue, Beijing Normal University, China*

**TUP.P7.57** Board 57
**FRACTAL AND MULTIFRACTAL CHARACTERISTICS OF VERY HIGH RESOLUTION SATELLITE IMAGES**
*Anna Wawrzaszek, Michal Krupinski, Sebastian Aleksandrowicz, Space Research Center, Polish Academy of Sciences, Poland; Wojciech Drzewiecki, AGH University of Science and Technology, Poland*

**TUP.P7.58** Board 58
**A RURAL CONSTUCTION LAND EXTRACTION ALGORITHM FOR UAV IMAGES BASED ON IMPROVED GAUSSIAN MIXTURE MODEL AND MARKOV RANDOM FIELD**
*Wei Wang, Yunhao Chen, Xuran Zhang, Beijing Normal University, China*

**TUP.P7.59** Board 59
**BOUNDARY REGULARIZATION AND BUILDING RECONSTRUCTION BASED ON TERRESTRIAL LASER SCANNING DATA**
*Fangjian Wang, Xiaohuan Xi, Cheng Wang, Yong Xiao, Yiping Wan, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*



### Information Extraction for Land and Maritime Applications

Session Co-Chairs: Begüm Demir, University of Trento; Jon Mitchell, University of Texas at Arlington

**TUP.P8.60** Board 60
**RETRIEVAL OF OCEAN WAVELENGTH AND WAVE DIRECTION FROM SAR IMAGE BASED ON RADON TRANSFORM**
*Wei Zhao, Guoqing Zhou, Tao Yue, Bo Yang, Xiaodong Tao, Jingjin Huang, Chuntao Yang, Guilin University of Technology, China*

**TUP.P8.61** Board 61
**INTEGRATED MARITIME PICTURE FOR SURVEILLANCE AND MONITORING APPLICATIONS**
*Gerard Margarit, GMV Aerospace and Defence, S.A.U., Spain*

**TUP.P8.62** Board 62
**SHIP DETECTION IN SOUTH AFRICAN OCEANS USING A COMBINATION OF SAR AND HISTORIC LRIT DATA**
*Waldo Kleynhans, Brian Salmon, Colin Schwegmann, Vincent Seotlo, Council for Scientific and Industrial Research, South Africa*

**TUP.P8.63** Board 63
**ANALYSIS OF EFFECTIVE WINDOW SIZE IN TEXTURE-BASED CLASSIFICATION OF 2006-2010 ALOS PALSAR 25M MOSAIC IMAGES**
*Margie Parinas, Enrico Paringit, University of the Philippines, Diliman, Philippines*

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**MEAN TRANSLATION OF GLCM TEXTURE FEATURES FOR ACROSS-DATE SETTLEMENT TYPE CLASSIFICATION OF QUICKBIRD IMAGES**
*Francois Luus, University of Pretoria, South Africa; Frans van den Bergh, CSIR Meraka Institute, South Africa; Bodhaswar Maharaj, University of Pretoria, South Africa*

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**EFFECTIVE BUILDING DETECTION IN COMPLEX SCENES**
*Mohammad Awrangjeb, Monash University, Australia; Clive Fraser, University of Melbourne, Australia*

### Information Extraction in Electromagnetic and Subsurface Problems

Session Chair: Fabio Del Frate, Tor Vergata University

**TUP.P9.66** Board 66 **CROSS-CORRELATION PROCESSING BASED AN ENERGY DETECTION ALGORITHM FOR NON-CARRIER UWB RADAR**
*Jisi Dong, Shunsheng Zhang, Xiu Wu, University of Electronic Science and Technology of China, China*

**TUP.P9.67** Board 67 **ESTIMATING DOWNWARD SURFACE SHORTWAVE RADIATION USING MTSAT-1R AND GROUND MEASUREMENTS DATA BY BAYESIAN MAXIMUM ENTROPY METHOD**
*Xiaotong Zhang, Beijing Normal University, China; Shunlin Liang, University of Maryland, United States; Gongqi Zhou, Beijing Normal University, China*

**TUP.P9.68** Board 68 **MULTILAYER PERCEPTRON WITH GENETIC ALGORITHM FOR WELL LOG DATA INVERSION**
*Kou-Yuan Huang, National Chiao Tung University, Taiwan; Liang-Chi Shen, University of Houston, United States; Kai-Ju Chen, Ming-Che Huang, National Chiao Tung University, Taiwan*

**TUP.P9.69** Board 69 **SEISMIC VELOCITY PICKING BY GENETIC ALGORITHM**
*Kou-Yuan Huang, Kai-Ju Chen, Jia-Rong Yang, National Chiao Tung University, Taiwan*

**TUP.P9.70** Board 70 **COMPRESSION OF SAR INTERFEROGRAMS FOR PARAMETER RETRIEVAL USING NEURAL NETWORKS**
*Matteo Picchiani, Fabio Del Frate, Giovanni Schiavon, University of Rome Tor Vergata, Italy; Salvatore Stramondo, Istituto Nazionale di Geofisica e Vulcanologia, Italy*

**TUP.P9.71** Board 71 **A FUSION METHOD OF IMPROVING FILTERED INTERFEROGRAM QUALITY**
*Sheng Gao, Qiming Zeng, Jian Jiao, Qingxi Tong, Peking University, China*



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Session Co-Chairs: Linwood Jones, University of Central Florida; Peter Minnett, University of Miami

**TUP.P10.72** Board 72 **ON THE ASSESSMENT OF SMOS SALINITY RETRIEVAL BY USING SUPPORT VECTOR REGRESSION (SVR)**
*Roberto Sabia, European Space Agency, Italy; Mattia Marconcini, German Aerospace Center (DLR), Germany; Thomas Katagis, Diego Fernández-Prieto, European Space Agency, Italy; Marcos Portabella, SMOS Barcelona Expert Centre - ICM-CSIC, Spain*

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*Katarzyna Bradtke, Aleksandra Wisz, Institute of Oceanography, University of Gdansk, Poland*

**TUP.P10.74** Board 74 **REMOTE SENSING MONITORING OF THERMAL DISCHARGE IN DAYA BAY NUCLEAR POWER STATION BASED ON HJ-1 INFRARED CAMERA**
*Li Zhu, Shoujing Yin, Chuanqing Wu, Wandong Ma, Jing Xu, Satellite Environment Center, Ministry of Environmental Protection, China*

**TUP.P10.75** Board 75 **DESIGN OF PHASED ARRAY MICROWAVE SCATTEROMETER WITH DIGITAL BEAM FORMING TECHNIQUE IN ACTIVE AND PASSIVE COMBINING OBSERVATION SYSTEM FOR SEA SURFACE SALINITY**
*Xiangkun Zhang, Hao Liu, Center for Space Science and Applied Research, Chinese Academy of Sciences, China*

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*Xianwen Ding, Shanghai Ocean University, China; Ferdinando Nunziata, Parthenope University of Naples, Italy; Xiaofeng Li, National Oceanic and Atmospheric Administration, United States; Maurizio Migliaccio, Parthenope University of Naples, Italy*

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*Saswati Deb, Arun Chakraborty, Indian Institute of Technology Kharagpur, India*

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*Hyun-Woo Choi, Korea Institute of Ocean Science & Technology (KIOST), Republic of Korea*



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*Ninoslav Majurec, Joel Johnson, The Ohio State University, United States; David Lyzenga, Okey Nwogu, University of Michigan, United States; Andrew O'Brien, Graeme Smith, Jon Pozderac, Dennis Trizna, The Ohio State University, United States*

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*Alireza Shamshiri, Azad University of Bushehr, Iran; Ahmad Kehavarz, Persian Gulf University Of Bushehr, Iran; Yaser Mansouri, The University of Melbourne, Austria*

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*Alireza Shamshiri, Azad University of Bushehr, Iran; Ahmad Kehavarz, Persian Gulf University Of Bushehr, Iran; Yaser Mansouri, The University of Melbourne, Australia*

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*Jochen Horstmann, Ruben Carrasco, Cristina Lido, Centre for Maritime Research and Experimentation, Italy; Björn Lund, Hans C. Graber, University of Miami - RSMAS, United States*

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*Francesco Serafino, IREA-CNR, Italy; Giovanni Ludeno, Vitrociset S.p.A., Italy; Claudio Lugni, INSEAN-CNR, Italy; Antonio Natale, IREA-CNR, Italy; Daniele Arturi, Vitrociset S.p.A., Italy; Carlo Brandini, IBIMET - CNR, Italy; Francesco Soldovieri, IREA-CNR, Italy*

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*Victor Raizer, Zel Technologies, LLC, United States*

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Session Chair: Ke Wang, University of New South Wales

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*Ke Wang, Xiaojing Li, Linlin Ge, University of New South Wales, Australia*

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*Shaohui Jin, Xidian University, China; Xiaofeng Li, National Oceanic and Atmospheric Administration, United States; Shuang Wang, Xidian University, China*

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*Xiaofeng Yang, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China; Xiaofeng Li, National Oceanic and Atmospheric Administration / NESDIS, United States; Weizhong Zheng, William Pichel, National Oceanic and Atmospheric Administration / NWS, United States; Ziwei Li, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China*

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*Victor Bakhanov, Nikolay Bogatov, Aleksey Ermoshkin, Olga Kemarskaya, Institute of Applied Physics, Russian Academy of Sciences, Russian Federation*



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*Xi-Yu Xu, He-Guang Liu, Shuang-Bao Yang, The CAS Key Laboratory of Microwave Remote Sensing, Center for Space Science and Applied Research, Chinese Academy of Sciences, China; Ting-Ting Shi, Alcatel-Lucent Shanghai Bell Company, China*

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*Beatriz Martín-Atienza, Universidad Autónoma de Baja California, Mexico; Josué Álvarez-Borrego, Centro de Investigación Científica y de Educación Superior de Ensenada, Mexico*

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Session Co-Chairs: Thomas Fügen, Astrium GmbH; Robert Wang, Institute of Electronics, Chinese Academy of Sciences

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*Huazeng Deng, University of Washington, United States; Yuriy V. Goncharenko, Institute of Radiophysics and Electronics NAS of Ukraine, Ukraine; Gordon Farquharson, University of Washington, United States*

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*Jie Wang, University of Chinese Academy of Sciences, China; Longyong Chen, Xing-dong Liang, Chibiao Ding, Liangjiang Zhou, Yongwei Dong, Chinese Academy of Sciences, China*

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*Masayoshi Tsuchida, Kei Suwa, Kazuhiko Yamamoto, Toshio Wakayama, Hideki Hasegawa, Kei Hayashi, Jun Endo, Yosuke Nakano, Mitsubishi Electric Corporation, Japan*



## Active Microwave Sensors and Calibration

Session Chair: Jiancheng Shi, Institute of Remote Sensing Applications, Chinese Academy of Sciences

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*Alireza Tabatabaeenejad, University of Southern California, United States; Mariko Burgin, University of Michigan, United States; Mahta Moghaddam, University of Southern California, United States*

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*Zhongguo Song, Xiaolong Dong, Di Zhu, Xing-Ou Xu, Tao Wang, National Space Science Center, Chinese Academy of Sciences, China*

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*Wen Jiang, Wenchao Li, Yulin Huang, Zhe Liu, Junjie Wu, Jianyu Yang, University of Electronic Science and Technology of China, China*

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*Di Zhu, National Space Science Center, Chinese Academy of Sciences, China; Lei Zhang, DFH Satellite Co. Ltd, China; Xiaolong Dong, Xing-ou Xu, Zhongguo Song, National Space Science Center, Chinese Academy of Sciences, China; Shuyan Lang, National Satellite Ocean Application Service, China; Shaobo Wang, DFH Satellite Co. Ltd, China*

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*Bingqi Zhu, Kaizhi Wang, Xingzhao Liu, Jianjun Li, Shanghai Jiao Tong University, China*

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*Ke Xu, Key Laboratory of Microwave Remote Sensing, Center for Space Science and Applied Research,Chinese Academy of Sciences, China; Jingshan Jiang, Heguang Liu, Key Laboratory of Microwave Remote Sensing, Center for Space Science and Applied Research, Chinese Academy of Sciences, China*

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*Yajun Li, Yinsheng Wei, Zhuoqun Wang, Harbin Institute of Technology, China*

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*Pietro Guccione, Mariantonietta Zonno, Politecnico di Bari, Italy; Giovanni Nico, Consiglio Nazionale delle Ricerche, Italy; Marco Nicoletti, Andrea Di Pasquale, Dial srl, Italy*

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*Kumar Vijay Mishra, Anton Kruger, Witold Krajewski, The University of Iowa, United States*



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*Rahul Ramachandran, John Rushing, Amy Lin, University of Alabama-Huntsville, United States; Kwo-Sen Kuo, Caelum, United States; Thomas Clune, NASA, United States*

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*Xueping Luo, Jinping Bai, Yunping Chen, Ling Tong, University of Electronic Science and Technology of China, China*

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*Kuldeep Kurte, Surya Durbha, Indian Institute of Technology Bombay, India*

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*Meixia Deng, Liping Di, George Mason University, United States*

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*Kwangseob Kim, Sanggoo Kang, Kiwon Lee, Hansung University, Republic of Korea*

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*Taeyoon Lee, Youn-Soo Kim, Korea Aerospace Research Institute, Republic of Korea*

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*Kwo-Sen Kuo, NASA Goddard Space Flight Center/Caelum Research Corp., United States; John Rushing, Rahul Ramachandran, University of Alabama-Huntsville, United States; Thomas Clune, NASA Goddard Space Flight Center, United States; Udaysankar Nair, University of Alabama-Huntsville, United States*

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*Julia Yagüe, Donata Pedrazzani, David de la Fuente, GMV Aerospace, Spain*

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*Sanggoo Kang, Kwangseob Kim, Kiwon Lee, Hansung University, Republic of Korea*

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*Yunqin Zhong, Jinyun Fang, Xiaofang Zhao, Institute of Computing Technology, Chinese Academy of Sciences, China*

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*Sahbi Bahrouni, Nozha Boujemaa, inria rocquencourt, France; Ziad Belhadji, supcom, Tunisia*

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*Cunjian Yang, Jing Ni, He Huang, Sichuan Normal University, China; Wuxue Cheng, Sichuan Normal University; Institute of Mountain Hazards and Environment Chinese Academy of Sciences, China; Shaou Han, Sichuan Normal University, China*

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*Cunjian Yang, He Huang, Shaou Han, Jing Ni, Sichuan Normal University, China*

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*Yuan Qi, Jinlong Zhang, Zheng Zhong, Feinan Xu, Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences, China*

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*Daniela Espinoza-Molina, Mihai Datcu, German Aerospace Center (DLR), Germany*

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*Prakash Andugula, Surya Durbha, Indian Institute of Technology Bombay, India; Roger King, Nicolas H. Younan, Mississippi State University, United States*

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*Dušan Gleich, Peter Planinšic, University of Maribor, Slovenia; Jagmal Sign, German Aerospace Center (DLR), Germany*

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*Colm Jordan, British Geological Survey, United Kingdom; Stéphane Chevrel, Bureau de Recherches Géologiques et Minières, France; Henk Coetzee, Council of Geosciences, South Africa; Eyal Ben Dor, Tel Aviv University, Israel; Christoph Ehrler, Christian Fischer, German Aerospace Center (DLR), Germany; Stephen Grebby, British Geological Survey, United Kingdom; Gregoire Kerr, German Aerospace Center (DLR), Germany; Ido Livne, Tel Aviv University, Israel; Veronika Kopacková, Czech Geological Survey, Czech Republic; Ernis Kylychbaev, Central Asian Institute for Applied Geosciences, Kyrgyzstan; Fiona McEvoy, British Geological Survey, United Kingdom; Simon Adar, Tel Aviv University, Israel*

**TUP.P21.133 SPATIAL-SPECTRAL CLASSIFICATION BASED ON GROUP**
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*Xiangrong Zhang, Peng Weng, Jie Feng, Erlei Zhang, Biao Hou, Xidian University, China*



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Session Chair: Tobias Landmann, International Center of Insect Physiology and Ecology (ICIPE)

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*Katarzyna Dabrowska-Zielinska, Monika Tomaszewska, Maria Budzynska, Sophie Rychlik, Iwona Malek, Maciej Bartold, Martyna Gatkowska, Alicja Malinska, Konrad Turlej, Institute of Geodesy and Cartography, Poland*

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*Juan Gu, Lanzhou University, China; Chunlin Huang, Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences, China*

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*Yupeng Liu, Deyong Yu, Bin Xun, Ruifang Hao, Yun Sun, Beijing Normal University, China*

## Dynamics of Earth Processes and Climate Change - Hydrosphere/ Geosphere

Session Chair: Wouter Dorigo, Vienna University of Technology

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*Ronglin Tang, Zhao-Liang Li, Xiaomin Sun, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, China*

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*Haibo Wang, Mingguo Ma, Wenping Yu, Guanghui Huang, Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences, China*

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*Hsiu-Wen Wang, Kun-Shan Chen, National Central University, Taiwan*

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*Yixing Ding, Institute of Electronics, Chinese Academy of Sciences, China; HuaDong Guo, Guang Liu, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*



## Dynamics of Earth Processes and Climate Change - Biosphere/ Atmosphere

Session Co-Chairs: Mathias Kneubuehler, University of Zurich; Jianjun Xu, George Mason University

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*Di Chen, Ocean University of China, China; Tao Zuo, Jinnian Chen, Institute of Oceanology, Chinese Academy of Sciences, China*

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*Mathias Kneubühler, Alexander Damm, University of Zurich, Remote Sensing Laboratories, Switzerland; Anna-Katharina Schweiger, Swiss National Park, Switzerland; Parviz Fatehi, Michael E. Schaepman, University of Zurich, Remote Sensing Laboratories, Switzerland*

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*Tianxing Wang, Jiancheng Shi, Yingying Jing, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

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*Jinnian Chen, Tao Zuo, Yang Wang, Hongna Wang, Institute of Oceanology, Chinese Academy of Sciences, China*

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*Hengqian Zhao, Lifu Zhang, Taixia Wu, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China; Yini Duan, Institute of Remote Sensing and Geographic Information System, Peking University, China; Yi Cen, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China*

## Polarimetric Decompositions and Classifications

Session Chair: Keith Morrison, Cranfield University

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*Xiaodong Huang, Xiuguo Liu, Qihao Chen, China University of Geosciences, China*

**WEP.P1.2** Board 2 **SNOW AND SEA ICE ROUGHNESS CHARACTERIZATION FROM QUAD-POL H-A-A CLASSES RELATIVE DISTRIBUTION.**
*Eric Hudier, Simon Tolzczuk-Leclerc, UQAR, Canada*

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*Juan Xu, Zhen Li, Bangsen Tian, Quan Chen, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

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*Tzu-Yu Cheng, Kun-Shan Chen, National Central University, Taiwan; Yoshio Yamaguchi, Niigata University, Japan; Jong-Sen Lee, National Central University, Taiwan*



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Session Chair: Marco Lavalle, NASA Jet Propulsion Laboratory

**WEP.P2.5** Board 5 **SENSITIVITY OF MULTI-SOURCE SAR BACKSCATTER TO CHANGES OF FOREST ABOVEGROUND BIOMASS**
*Wenli Huang, Guoqing Sun, University of Maryland, United States; Zhiyu Zhang, Chinese Academy of Sciences, United States; Wenjian Ni, University of Maryland, United States*

**WEP.P2.6** Board 6 **POLARIMETRIC SAR INTERFEROMETRY FOR FOREST CANOPY ANALYSIS BY USING THE ITERATIVE METHOD**
*Ming Guo, Zhen Li, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China; Jie-Xing Lin, HeKou National Meteorological Observing Station, China; Zhong-qiong Wang, Beijing Research Institute of Uranium Geology, China; Jiu-Liang Liu, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

**WEP.P2.7** Board 7 **CFAR HIERARCHICAL CLUSTERING OF POLARIMETRIC SAR DATA**
*Pierre Formont, Supélec, France; Miguel Angel Veganzones, GIPSA-lab, France; Joana Frontera-Pons, Frédéric Pascal, Supélec, France; Jean-Philippe Ovarlez, ONERA, France; Jocelyn Chanussot, GIPSA-lab, France*

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*Yanan Jiang, Mingsheng Liao, Wuhan University, China; Hanmei Wang, Shanghai Institute of Geological Survey, China; Timo Balz, Lu Zhang, Wuhan University, China*

**WEP.P2.9** Board 9 **THE USE OF POLARIMETRIC C-BAND DATA FOR PASTURE MAPPING**
*Zheng-Shu Zhou, Waqar Ahmad, Alex Held, Jeremy Wallace, The Commonwealth Scientific and Industrial Research Organisation, Australia*

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*Yongjun Cai, Nan Jia, Xiangkun Zhang, Xiaolong Dong, Heguang Liu, Center for Space Science and Applied Research, Chinese Academy of Sciences, China*

**WEP.P2.11** Board 11 **POLINSAR AIRBORNE PRINCIPLE VERIFICATION EXPERIMENT BASED ON KU-BAND MULTIFUNCTION RADAR SYSTEM**
*Nan Jia, Yongjun Cai, Xiangkun Zhang, Xiaolong Dong, Heguang Liu, Center for Space Science and Applied Research, Chinese Academy of Sciences, China*

**WEP.P2.12** Board 12 **POLARIMETRIC SCATTERING TOPIC MODEL FOR POL-SAR IMAGE ANNOTATION**
*Leyi Zhou, Jiayu Chen, Fan Hu, Hong Sun, Signal Processing Laboratory, School of Electronic Information, Wuhan University, China*

## PolSAR Image Analysis

Session Chair: Tom Ainsworth, Naval Research Laboratory

**WEP.P3.13** Board 13 **STATISTICAL MODELING OF POLSAR IMAGES WITH GENERALIZED GAMMA DISTRIBUTION FOR BACKSCATTER**
*Xianxiang Qin, Shilin Zhou, Huanxin Zou, Gui Gao, National University of Defense Technology, China*

**WEP.P3.14** Board 14 **MODIFIED POLARIMETRIC WHITENING FILTER FOR POLARIMETRIC SAR DATA**
*Wen-Tao An, Mingsen Lin, Chunhua Xie, Guangyi Zhou, Xinzhe Yuan, National Satellite Ocean Application Service, China*



## Bistatic SAR I

Session Chair: Marc Rodriguez-Cassola, German Aerospace Center (DLR)

**WEP.P4.15** Board 15 **A NONLINEAR CHIRP SCALING ALGORITHM FOR TANDEM BISTATIC SAR**
*Shichao Chen, Mengdao Xing, Taoli Yang, Zheng Bao, Xidian University, China*

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*Jianyu Yang, Qingying Yi, Zhongyu Li, Junjie Wu, Yulin Huang, University of Electronic Science and Technology of China, China*

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*Miao Yu, Xiaoling Zhang, Zhe Liu, University of Electronic Science and Technology of China, China*

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*Huan Huang, Xiaoling Zhang, Zhe Liu, University of Electronic Science and Technology of China, China*

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Session Chair: Yuliya Tarabalka, Inria, Sophia Antipolis

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*Chih-Cheng Hung, Ellis Casper, Southern Polytechnic State University, United States; Bor-Chen Kuo, National Taichung University, Taiwan; Wenping Liu, Beijing Forestry University, China; Xiaoyi Yu, Anyang Normal University, China; Edward Jung, Ming Yang, Southern Polytechnic State University, United States*

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*Kerem Sahin, ASELSAN Inc., Turkey; Ilkay Ulusoy, Middle East Technical University, Turkey*

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*Jihao Yin, Yin Xu, Hui Li, Yueshan Liu, Beihang University, China*



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Session Chair: Timo Balz, Wuhan University

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*Young Woo Jeon, Yoonsung Bae, Jong Beom Ra, Korea Advanced Institute of Science and Technology, Republic of Korea*

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*Yangchi Liu, Yulin Huang, Qingying Yi, Jianyu Yang, University of Electronic Science and Technology of China, China*

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*Yongquan Zhao, Xiaojun Shan, Ping Tang, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

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*Roger Edberg, Simon Oliver, Geoscience Australia, Australia*

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*Yan Lu, Yongqing Chen, China University of Geosciences, China; Chao Chen, Shandong Construction Development Research Institute, China; Xiao Zhou, Peking University, China*

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*Yuhao Zhou, Qiuze Yu, Sunni Hua, Wen Yin, Yuanxiang Li, Shanghai Jiao Tong University, China*

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*Javier Gimenez, Universidad Nacional de Cordoba, Argentina; Alejandro César Frery, Universidade Federal de Alagoas, Brazil; Ana Georgina Flesia, Universidad Nacional de Cordoba, Argentina*

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*Daniel Capella Zanotta, National Institute for Space Research Brazil, Brazil; Victor Haertel, UFRGS, Brazil*

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*Hanye Pu, Bin Wang, Geng-Ming Jiang, Jian Qiu Zhang, Bo Hu, Dan Li, Fudan University, China*

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*Willem Marais, Yu Hen Hu, Robert Holz, University of Wisconsin-Madison, United States*

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*Shuang Zhou, Hao Chen, Yu Tao, Ye Zhang, Meng Zhang, Harbin Institute of Technology, China*

**WEP.P6.34** Board 34 **COMPRESSIVE SENSING OF MULTISPECTRAL IMAGE BASED ON PCA AND BREGMAN SPLIT**
*Peng Liu, Lingjun Zhao, Yan Ma, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

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*Chung-Chih Liu, Liang-De Chen, Minghsin University, Taiwan*

**WEP.P7.36** Board 36 **NON-ZERO MEAN STATISTICAL MODELS FOR URBAN AREA POLARIZATION SAR IMAGES**
*Wenjin Wu, DADI CAS, China; HuaDong Guo, Xinwu Li, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China; Jie Chen, Beihang University, China; Yigxing Ding, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

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*Limei Zhou, Wenbo Xu, Zhaoxian Wang, Wenzhi Zhang, University of Electronic Science and Technology of China, China; Jing Wang, Xiaoyu Zhang, Ningxia Institute of Meteorological Science, China; Jinlong Fan, China Meteorological Administration, China*

**WEP.P7.38** Board 38 **CORRECTING ERRORS IN VISUALLY INTERPRETED LAND USE DATA -- AN MACHINE LEARNING APPROACH**
*Tao Zhang, Xiaomei Yang, Quanwen Li, State Key Laboratory of Resources and Environmental Information System (LREIS), IGSNRR, China*

**WEP.P7.39** Board 39 **NEIGHBORHOOD PRESERVING NONNEGATIVE MATRIX FACTORIZATION FOR SPECTRAL MIXTURE ANALYSIS**
*Shaohui Mei, Mingyi He, Zhiming Shen, Baassou Belkacem, Northwestern Polytechnical University, China*

**WEP.P7.40** Board 40 **A NEW COMPREHENSIVE SECURITY PROTECTION FOR REMOTE SENSING IMAGE BASED ON THE INTEGRATION OF ENCRYPTION AND WATERMARKING**
*Li Jiang, Zhengzhou University, China; Zhengquan Xu, Yanyan Xu, Wuhan University, China*

**WEP.P7.41** Board 41 **COMBINE LABELED AND UNLABELED INFORMATION FOR HYPERSPECTRAL IMAGE CLASSIFICATION**
*Qian Du, Deok Han, Nicolas H. Younan, Mississippi State University, United States*

**WEP.P7.42** Board 42 **A QUANTUM-MODELED ARTIFICIAL BEE COLONY CLUSTERING ALGORITHM FOR REMOTELY SENSED MULTI-BAND IMAGE SEGMENTATION**
*Chih-Cheng Hung, Ellis Casper, Southern Polytechnic State University, United States; Bor-Chen Kuo, National Taichung University, Taiwan; Wenping Liu, Beijing Forestry University, China; Edward Jung, Ming Yang, Southern Polytechnic State University, United States*

**WEP.P7.43** Board 43 **SHIP CLASSIFICATION IN TERRASAR-X SAR IMAGES BASED ON CLASSIFIER COMBINATION**
*Kefeng Ji, Xiangwei Xing, Wenting Chen, Huanxin Zou, National University of Defense Technology, China; Junli Chen, Shanghai Academy of Spaceflight Technology, China*

**WEP.P7.44** Board 44 **IMPACT ON POLARIMETRIC SAR CALIBRATION OF SAR SUPERRESOLUTION IMAGING ALGORITHM**
*Ping Zhang, Center for Earth Observation and Digital Earth, Chinese Academy of Sciences, China; Shiqun Zhang, Beijing Nufront Technology Co.Ltd, China*

**WEP.P7.45** Board 45 **JOINT IHS AND VARIATIONAL METHODS FOR PAN-SHARPENING OF VERY HIGH RESOLUTION IMAGERY**
*Ze-ming Zhou, Ping-lv Yang, Institute of Meteorology and Oceanography, PLA University of Science and Technology, China; Yuanxiang Li, Wen Yin, School of Aeronautics and Astronautics, Shanghai Jiao Tong University, China; Lin Jiang, Institute of Meteorology and Oceanography, PLA University of Science and Technology, China*

**WEP.P7.46** Board 46 **A PARALLEL APPROACH OF MULTI-LEVEL MORPHOLOGICAL ACTIVE CONTOUR ALGORITHM FOR INDIVIDUAL TREE DETECTION AND CROWN DELINEATION**
*Yi-Ling Chen, Chao-Cheng Wu, Hung-Chang Lin, National Taipei University of Technology, Taiwan; Chinsu Lin, National Chiayi University, Taiwan*

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*Jing Jin, Chao Tao, Huiyun Ma, Zhengrong Zou, Central South University, China*



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Session Chair: Giona Matasci, University of Lausanne

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*Muhammad Kamal, Stuart Phinn, Kasper Johansen, The University of Queensland, Australia*

**WEP.P8.49** Board 49 **VALIDITY OF SOIL ISOLINE EQUATIONΣFOR A SYSTEM OF CANOPY AND SOIL LAYERS**
*Kenta Taniguchi, Aichi Prefectural University, Japan; Kenta Obata, University of Hawaii at Manoa, United States; Masayuki Matsuoka, Kochi University, Japan; Hiroki Yoshioka, Aichi Prefectural University, Japan*

**WEP.P8.50** Board 50 **BIOME MISCLASSIFICATION AND MODIS LEAF AREA INDEX ESTIMATION: A STATISTICAL PERSPECTIVE**
*Hongliang Fang, Wenjuan Li, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, China; Ranga Myneni, Boston University, United States*

**WEP.P8.51** Board 51 **HIGH DENSITY AIRBORNE LIDAR ESTIMATION OF DISRUPTED TREES INDUCED BY LANDSLIDES**
*Khamarrul Azahari Razak, Universiti Teknologi Malaysia, Malaysia; Alexander Bucksch, Georgia Institute of Technology, United States; Menno Straatsma, Utrecht University, Netherlands; Cees J van Westen, University of Twente, Netherlands; Rabieahtul Abu Bakar, Universiti Kebangsaan Malaysia, Malaysia; Steven De Jong, Utrecht University, Netherlands*

**WEP.P8.52** Board 52 **RETRIEVAL OF FOREST BIOPHYSICAL PARAMETERS USING PHYSICALLY-BASED ALGORITHMS**
*Guoqing Sun, Wenjian Ni, Forrest Hall, University of Maryland, United States; Jeffrey Masek, Temilola Fatoyinbo, NASA Goddard Space Flight Center, United States; Derek Peddle, University of Maryland, United States*

**WEP.P8.53** Board 53 **LOCAL SPATIAL ANALYSIS IN SURFACE INFORMATION EXTRACTION OF COAL MINING AREAS WITH HIGH FRACTIONAL VEGETATION COVER USING MULTISOURCE REMOTE SENSING DATA**
*Nan Wang, Chen Du, Qiming Qin, Peking University, China*

**WEP.P8.54** Board 54 **STUDY ON THE TECHNOLOGY OF OIL AND GAS EXPLORATION BY USING THE DIFFERENTIAL SPECTRUM OF PLANTS**
*Qianqian Li, Xiaomei Chen, Bingjing Mao, Ye Cheng, Guoqiang Ni, Beijing Institute of Technology, China*

**WEP.P8.55** Board 55 **SEMI-SUPERVISED CLUSTERING OF VHR PANCHROMATIC SATELLITE IMAGE USING LATENT DIRICHLET ALLOCATION MODEL**
*Hong Tang, Li Shen, Lili Miao, Yunhao Chen, Jing Li, Shaodan Li, Beijing Normal University, China*

**WEP.P8.56** Board 56 **THE STUDY OF ROAD DAMAGE DETECTION BASED ON HIGH-RESOLUTION SAR IMAGE**
*Xirui Zhang, Yan Chen, Mingquan Jia, Ling Tong, University of Electronic Science and Technology of China, China; Youchun Lu, China Centre for Resources Satellite Data and Application, China; Yongxin Cao, Sichuan Electric Power Research Institute, China*

**WEP.P8.57** Board 57 **MOVING HUMAN TARGET DETECTION IN FOLIAGE ENVIRONMENTS BASED ON HOUGH TRANSFORM**
*Pengzheng Lei, Xiaotao Huang, Chongyi Fan, Kefeng Ji, Xianxiang Qin, National University of Defense Technology, China*

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**WEP.P9.58** Board 58 **BASED ON REMOTE SENSING PROCESSING TECHNOLOGY ESTIMATING THE EVAPORATION FROM IRRIGATION CANALS IN ARID REGIONS**
*Suhua Liu, Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences, China; Shuai Cheng, Northeast Institute of Geography and Agroecology, Chinese Academy of Sciences, China; Jinxin Zhuang, Weizhen Wang, Tetsuo Kobayashi, Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences, China*

**WEP.P9.59** Board 59 **THE RELATION BETWEEN ACCURACY AND SIZE OF STRUCTURE ELEMENT FOR VEHICLE DETECTION WITH HIGH RESOLUTION HIGHWAY AERIAL IMAGES**
*Shang Li, University of Electronic Science and Technology of China, China; Guoqing Zhou, Guilin University of Technology, China; Zezhong Zheng, University of Electronic Science and Technology of China, China; Yalan Liu, Chinese Academy of Sciences, China; Xiaowen Li, Beijing Normal University and the Institute of Remote Sensing and Digital Earth of Chinese Academy of Sciences, China; Ying Zhang, University of Electronic Science and Technology of China, China; Tao Yue, Guilin University of Technology, China*



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*Kathryn Sheffield, Elizabeth Morse-McNabb, Victorian Department of Environment and Primary Industries, Australia*

**WEP.P10.61** Board 61 **LAND USE INTENSITY ASSESSED THROUGH GEOTECHNOLOGY IN BRAZILIAN SAVANNAH AND THE EFFECTS ON SOIL NUTRIENT**
*Kleber Trabaquini, Antonio Roberto Formaggio, Lênio Soares Galvão, Marcio Pupin Mello, National Institute of Spatial Research – INPE, Brazil*

**WEP.P10.62** Board 62 **RELATIONSHIPS BETWEEN LAND USE PATTERN AND SURFACE WATER QUALITY IN BEIJING**
*Ke Liu, Satellite Surveying and Mapping Application Center, China; Xiaoyu Guo, Capital Normal University, China; Bing Lei, Satellite Surveying and Mapping Application Center, China; Yonghua Sun, Mingyu Wang, Capital Normal University, China; Chang Xu, Yuhang Gan, Yizhi Hu, Xiaotong Han, Satellite Surveying and Mapping Application Center, China*

**WEP.P10.63** Board 63 **CHANGE DETECTION IN THE TAPAJÓS NATIONAL FOREST THROUGH POST-CLASSIFICATION COMPARISON FOR RADARSAT - 2 DATA**
*Daniela Anjos, National Institute for Space Research - INPE, Brazil; Sidnei João Siqueira Sant'Anna, Instituto Nacional de Pesquisas Espaciais, Brazil; Luciano Dutra, National Institute for Space Research - INPE, Brazil*

**WEP.P10.64** Board 64 **EFFECT EVALUATION OF TOPOGRAPHIC ATTRIBUTES ON FOREST COVERAGE RATIOS BASED ON DIGITAL ELEVATION MODEL**
*Shojiro Tanaka, Shimane University, Japan; Ryuei Nishii, Kyushu University, Japan*

**WEP.P10.65** Board 65 **SPATIO-TEMPORAL PROCESS OF UNUSED LAND RESOURCES IN CHINA AND ITS ECOLOGICAL EFFECTS**
*Ling Yi, Zengxiang Zhang, Xiaoli Zhao, Bin Liu, Xiao Wang, Lijun Zuo, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

**WEP.P10.66** Board 66 **WINTER WHEAT PLANT AREA TRANSFORM MONITORING THROUTH REMOTE SENSING**
*Xiaoyu Song, NERCITA, China; Fangning Cui, Shang dong Jin ling Mining Industry Liability Company, China; Wenjiang Huang, Key laboratory of Digital Earth Sciences, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China; Xiaohe Gu, NERCITA, China; Bei Cui, Shanxi Agricultural University, China*

**WEP.P10.67** Board 67 **MONITORING LAND USE CHANGES ASSOCIATED WITH URBANIZATION IN THE UPPER BHIMA BASIN, MAHARASHTRA, INDIA.**
*Dipak R. Samal, Shirish S. Gedam, Indian Institute of Technology Bombay, India*

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*Feng-Chi Yu, Kuan-Tsung Chang, Minghsin University of Science and Technology, Taiwan; Long-Shin Liang, National Central University, Taiwan*

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*Kim Huong Hoang, Monique Bernier, Sophie Duchesne, National Institute of Scientific Research (INRS), Canada; Minh Y Tran, Space Technology Institute, Viet Nam*

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*Chew Wai Chang, Cheng Hua Shi, Soo Chin Liew, Leong Keong Kwoh, National University of Singapore, Singapore*

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*Hee Young Yoo, Inha University, Republic of Korea; Stefan Leyk, University of Colorado at Boulder, United States; No-Wook Park, Inha University, Republic of Korea*

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Session Co-Chairs: Mariko Burgin, University of Southern California; Sandy Peischl, Monash University

**WEP.P11.72 Board 72 AN APPROACH FOR SURFACE SOIL MOISTURE RETRIEVAL USING MICROWAVE VEGETATION INDICES BASED ON SMOS DATA**
*Qian Cui, Jiancheng Shi, Tianjie Zhao, Qiang Liu, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

**WEP.P11.73 Board 73 AN IMPROVED METHOD FOR DOWNSCALING SOIL MOISTURE RETRIEVED BY SMOS WITH MODIS LST/NDVI**
*Chengyun Song, Li Jia, State Key Laboratory of Remote Sensing Science, Jointly Sponsored by the Institute of Remote Sensing and Digital Earth of CAS and Beijing Normal University, China*

**WEP.P11.74 Board 74 A NEW METHOD FOR ESTIMATION OF BARE SURFACE SOIL MOISTURE USING TIME-SERIES RADAR OBSERVATIONS**
*Chenzhou Liu, Jiancheng Shi, Tianjie Zhao, Shuai Gao, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

**WEP.P11.75 Board 75 DOWNSCALING SMOS DERIVED SOIL MOISTURE USING SEMI-EMPIRICAL AND PHYSICAL APPROACHES**
*Djamai Najib, Ph.D / Université de Sherbrooke, Canada; Ramata Magagi, Université de Sherbrooke, Canada; Kalifa Goïta, Université de Sherbrooke, Centre d'applications et de recherches en télédétection (CARTEL), Canada; Olivier Merlin, CNRS Researcher / CESBIO, France; Mehdi Hosseini, Postdoctoral fellow / Université de Sherbrooke, Canada*

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*Tao Zhang, Lixin Zhang, Lingmei Jiang, Shaojie Zhao, Jun Liu, Beijing Normal University, China*

**WEP.P11.77 Board 77 HOW DOES THE SPATIAL SCALE AND THE SELECTION OF ANCILLARY DATA INFLUENCE THE EVALUATION OF EO SOIL MOISTURE PRODUCTS?**
*Marcela Doubkova, European Space Agency, Italy; Alena Hegyiová, Wouter Dorigo, Vienna University of Technology, Austria; Albert van Dijk, Australian National University, Australia; Diego Fernández-Prieto, European Space Agency, Italy*

**WEP.P11.78 Board 78 A PHYSICALLY-BASED ALGORITHM FOR SURFACE SOIL MOISTURE RETRIEVAL IN THE TIBET PLATEAU USING PASSIVE MICROWAVE REMOTE SENSING**
*Jiangyuan Zeng, Zhen Li, Quan Chen, Haiyun Bi, Ping Zhang, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

**WEP.P11.79 Board 79 THE SIMPLIFIED MODEL OF SOIL DIELECTRIC CONSTANT AND SOIL MOISTURE AT THE MAIN FREQUENCY POINTS OF MICROWAVE BAND**
*Quan Chen, Jiangyuan Zeng, Ping Zhang, Center for Earth Observation and Digital Earth, Chinese Academy of Sciences, China*

**WEP.P11.80 Board 80 THE USE OF REGULARIZATION FOR IMPROVING PROFILE SOIL MOISTURE RETRIEVALS**
*Alexandra Konings, Dara Entekhabi, Massachusetts Institute of Technology, United States*

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*Mariko Burgin, University of Michigan, United States; Alireza Tabatabaeenejad, Mahta Moghaddam, University of Southern California, United States*

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*Soon-Koo Kweon, Ji-Hwan Hwang, Yisok Oh, Hongik University, Republic of Korea*

**WEP.P11.83 Board 83 AN IMPEDANCE BASED APPROACH TO DETERMINE SOIL MOISTURE USING RADARSAT-2 DATA**
*Pooja Mishra, Shivangi Goel, Dharmendra Singh, Indian Institute of Technology Roorkee, India*

**WEP.P11.84 Board 84 SOIL MOISTURE INVERSION AND VALIDATION BASED ON NEW REMOTE SENSING PLATFORM**
*Chen Du, Qiming Qin, Mingchao Liu, Haixia Feng, Heng Dong, Nan Wang, Peking University, China*

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*Pang-Wei Liu, University of Florida, United States; Alejandro Monsivais-Huertero, Instituto Politécnico Nacional, Mexico; Jasmeet Judge, University of Florida, United States*



## Land Cover Change: Analysis Methods

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*Sam Nwaneri, Delandria Jones, TeAmbreya Moore, Jaclyn P. Kuzniar, Alcorn State University, United States*

**WEP.P12.87 Board 87 FEATURE LEVEL FUSION OF MULTI-TEMPORAL ALOS PALSAR AND LANDSAT DATA FOR MAPPING AND MONITORING DEFORESTATION AND FOREST DEGRADATION IN GUYANA**
*Johannes Reiche, Wageningen University, Netherlands; Carlos Souza Filho, Imazon – Amazon Institute of People and the Environment, Brazil; Dirk Hoekman, Jan Verbesselt, Wageningen University, Netherlands; Haimwant Persaud, Guyana Forestry Commission, Guyana; Martin Herold, Wageningen University, Netherlands*

**WEP.P12.88 Board 88 URBAN AREA TEMPORAL CHANGING ANALYSIS AND MODELING IN CHIANG MAI, THAILAND**
*Apitach Saokarn, Jointly Sponsored by the Institute of Remote Sensing and Digital Earth of Chinese Academy of Sciences and Beijing Normal University, Royal Thai Survey Department, China; Chunxiang Cao, Jointly Sponsored by the Institute of Remote Sensing and Digital Earth of Chinese Academy of Sciences and Beijing Normal University, China; Chotipa Kulrat, Mahidol University, Thailand*

**WEP.P12.89 Board 89 FUSION ALGORITHM OF PIXEL-BASED AND OBJECT-BASED CLASSIFIER FOR REMOTE SENSING IMAGE CLASSIFICATION**
*Aiying Zhang, Ping Tang, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

**WEP.P12.90 Board 90 LAND COVER CHANGE DETECTION USING UNSUPERVISED KERNEL C-MEANS AND MULTI-TEMPORAL SAR DATA**
*Mohammad Fazel, University of Tehran, Iran; Valentin Poncos, University of Calgary / Kepler Space Inc., Canada; Saeid Homayouni, University of Tehran, Iran; Mahdi Motagh, GFZ German Research Center for Geosciences, Germany*

**WEP.P12.91 Board 91 REMOTE SENSING IMAGE CLASSIFICATION APPROACH BASED ON SUB-BLOCK FEATURES**
*Aiying Zhang, Ping Tang, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

## Forests and Vegetation

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*Shijo Joseph, Center for International Forestry Research, Indonesia; Martin Herold, Wageningen University, Netherlands; William Sunderlin, Louis Verchot, Center for International Forestry Research, Indonesia*

**WEP.P13.93** Board 93 **SPECTRAL VARIABILITY OF ATLANTIC FOREST SPECIES**
*Matheus Pinheiro Ferreira, National Institute for Space Research - INPE, Brazil; Atilio Efrain Bica Grondona, Silvia Beatriz Alves Rolim, Federal University of Rio Grande do Sul, Brazil; Yosio Edemir Shimabukuro, National Institute for Space Research - INPE, Brazil*

**WEP.P13.94** Board 94 **SOLAR ILLUMINATION ANALYSIS FOR VEGETATION DISCRIMINATION ON HIGH VOLCANIC ISLANDS**
*Benoit Stoll, Sebastien Chabrier, Gepasud Laboratory University of French Polynesia, French Polynesia; Robin Pouteau, Bio-Protection Research Centre, Lincoln University, New Zealand*

**WEP.P13.95** Board 95 **CARBON AND FOREST PRODUCTIVITY LOSS FROM MOUNTAIN PINE BEETLE DISTURBANCE USING LANDSAT TIME SERIES, BIOPHYSICAL, HYDROLOGICAL AND METEOROLOGICAL INPUTS TO A CARBON MODEL.**
*Shiyong Xu, Derek Peddle, Sarah Boon, Craig Coburn, University of Lethbridge, Canada*

**WEP.P13.96** Board 96 **OPERATIONAL DELIVERY OF LONG TIME SERIES OF BIOPHYSICAL VARIABLES IN THE COPERNICUS LAND SERVICE**
*Philippe Pacholczyk, Centre National d'Études Spatiales, France; Roselyne Lacaze, HYGEOS, France; Frédéric Baret, Marie Weiss, Aleixandre Verger, Institut National de Recherche Agronomique, France; Bruno Smets, VITO, Belgium*

**WEP.P13.97** Board 97 **AN IMPROVED BIDIRECTIONAL REFLECTANCE DISTRIBUTION FUNCTION (BRDF) OVER RUGGED TERRAIN BASED ON MODERATE SPATIAL RESOLUTION REMOTE SENSING DATA**
*Bo Gao, State Key Laboratory of Remote Sensing Science, Jointly Sponsored by the Institute of Remote Sensing and Digital Earth of CAS and Beijing Normal University, China; Li Jia, Wageningen University and Research Centre, Netherlands; Massimo Menenti, Delft University of Technology, Netherlands*

**WEP.P13.98** Board 98 **HYPERSPECTRAL ASSESMENTS OF CONDITION AND SPECIES COMPOSITION OF AUSTRALIAN GRASSLANDS**
*Christopher Watson, Natalia Restrepo Coupe, Alfredo Huete, University of Technology, Sydney, Australia*

**WEP.P13.99** Board 99 **COMPARISON OF VEGETATION OPTICAL DEPTH ESTIMATION METHODS USING AMSR-E DATA**
*Yunqing Li, Jiancheng Shi, Tianjie Zhao, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

**WEP.P13.100** Board 100 **ELUCIDATIVE MECHANISM OF THE RECESSION OF ALPINE PLANTS AND THE INVASION OF DWARF BAMBOO KURILENSIS IN THE TAISETSU MOUNTAINS**
*Buho Hoshino, Rakuno Gakuen University, Japan; Gaku Kudo, Hokkaido University, Japan; Masami Kaneko, Rakuno Gakuen University, Japan; Hidehisa Taniuchi, Hokkaido University, Japan; Tetsuo Yabuki, Rakuno Gakuen University, Japan*

**WEP.P13.101** Board 101 **COMPARATIVE ANALYSIS OF HJ-1, SPOT, AND TM DATA FOR LEAF AREA INDEX ESTIMATION IN A MOUNTAINOUS AREA**
*Huaan Jin, Ainong Li, Jinhu Bian, Institute of Mountain Hazards and Environment, Chinese Academy of Sciences, China*

**WEP.P13.102** Board 102 **MONITORING PHENOLOGY OVER NEON TERRESTRIAL CORE SITES WITH THE DAILY MODIS BRDF/ALBEDO PRODUCT**
*Zhuosen Wang, Crystal Schaaf, Xiaoyuan Yang, University of Massachusetts Boston, United States; Jihyun Kim, Boston University, United States; Jeff Morisette, US Geological Survey, United States; Xiaoyang Zhang, National Oceanic and Atmospheric Administration, United States; Yanmin Shuai, NASA, United States; Courtney Meier, NEON, United States; Alan Strahler, Boston University, United States; Yun Yang, University of Massachusetts Boston, United States; Qingsong Sun, Boston University, United States; Yan Liu, University of Massachusetts Boston, United States*

**WEP.P13.103** Board 103 **REMOTE SENSING OF SOLAR-INDUCED CHLOROPHYLL FLUORESCENCE FROM AN UNMANNED AIRSHIP PLATFORM**
*Yang Peiqi, Liu Zhigang, Beijing Normal University, China*



## Agriculture: Remote Sensing of Vegetation Properties I

Session Chair: Jagannath Aryal, University of Tasmania

**WEP.P14.104** Board 104 **MAPPING FPAR IN CHINA WITH MODIS TIME-SERIES DATA BASED ON THE WIDE DYNAMIC RANGE VEGETATION INDEX**
*Taifeng Dong, Huanxue Zhang, Jihua Meng, Bingfang Wu, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

**WEP.P14.105** Board 105 **INVERSION OF PADDY LEAF AREA INDEX USING BEER-LAMBERT LAW AND HJ-1/2 CCD IMAGE**
*Xiaohe Gu, Jingcheng Zhang, Guijun Yang, Xiaoyu Song, Jinling Zhao, Bei Cui, Beijing Research Center for Information Technology in Agriculture, Beijing Academy of Agriculture and Forestry Sciences, China*

**WEP.P14.106** Board 106 **CROP INFORMATION EXTRACTION IN CHINA BASED ON NDVI CHARACTERISTIC CURVE**
*Peipei Xu, Hua Yang, Beijing Normal University, China; Tao Gao, Aerors Inc., China; Xiang Zhao, Donghai Wu, Beijing Normal University, China*

**WEP.P14.107** Board 107 **INTERCOMPARISON OF SEASONAL LEAF AREA INDEX ESTIMATION FROM DESTRUCTIVE SAMPLING, LAI-2200, DIGITAL HEMISPHERICAL PHOTOGRAPHY, AND ACCUPAR OVER PADDY RICE FIELDS**
*Hongliang Fang, Wenjuan Li, Shanshan Wei, Chongya Jiang, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, China*

**WEP.P14.108** Board 108 **ANALYZING THE CHARACTERISTICS OF FPAR FROM MAIZE CANOPIES MEASURED IN NORTHWEST CHINA**
*Donghui Xie, Yan Wang, School of Geography and Remote Sensing Science, Beijing Normal University, China; Peijuan Wang, Chinese Academy of Meteorological Sciences, China; Guangjian Yan, School of Geography and Remote Sensing Science, Beijing Normal University, China; Jinling Song, Beijing Normal University, China*

**WEP.P14.109** Board 109 **RECALIBRATING A SUGARCANE CROP MODEL USING THERMAL INFRARED DATA**
*Julien Morel, Valentine Lebourgeois, Jean-François Martiné, Pierre Todoroff, Agnès Bégué, Cirad, Réunion; Michel Petit, IRD, France*

## Agriculture: Remote Sensing of Vegetation Classification and Identification

Session Co-Chairs: Monique Bernier, National Institute of Scientific Research (INRS); Julien Osman, Centre d'Etudes Spatiales de la BIOsphère (CESBIO)

**WEP.P15.110**
Board 110 **EVALUATION OF ANNUAL SUGARCANE MONITORING USING MODIS/EVI TEMPORAL SERIES AND SPECTRAL MIXTURE ANALYSIS APPROACH**
*Luiz Vicente, Daniel Gomes, Daniel Victoria, Brazilian Agricultural Research Corporation, Brazil; Andréa Koga-Vicente, University of Campinas, Brazil; Fabio Iwashita, Griffith University, Australia*

**WEP.P15.111**
Board 111 **SPATIAL VARIABILITY OF WINTER WHEAT GROWTH BASED ON REMOTE SENSING**
*Bei Cui, Beijing Research Center for Information Technology in Agriculture, Beijing Academy of Agriculture and Forestry Sciences, China; Wenjiang Huang, Key laboratory of Digital Earth Sciences, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China; Wude Yang, College of Agronomy, Shanxi Agricultural University, China; Xiaoyu Song, Beijing Research Center for Information Technology in Agriculture, Beijing Academy of Agriculture and Forestry Sciences, China; Meichen Feng, College of Agronomy, Shanxi Agricultural University, China; Xiaohe Gu, Beijing Research Center for Information Technology in Agriculture, Beijing Academy of Agriculture and Forestry Sciences, China*

**WEP.P15.112**
Board 112 **SPATIO-TEMPORAL ANALYSIS OF CROPLAND CHANGES IN US IN THE LAST DECADE**
*Nagendra Singh, Oak Ridge National Laboratory, United States*

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Board 113 **CHARACTERIZATION OF POWDERY MILDEW IN WINTER WHEAT USING MULTI-ANGULAR HYPERSPECTRAL MEASUREMENTS**
*Jinling Zhao, Lin Yuan, Beijing Research Center for Information Technology in Agriculture, Beijing Academy of Agriculture and Forestry Sciences, China; Linsheng Huang, Key Laboratory of Intelligent Computing & Signal Processing, Ministry of Education, Anhui University, China; Dongyan Zhang, Jingcheng Zhang, Xiaohe Gu, Beijing Research Center for Information Technology in Agriculture, Beijing Academy of Agriculture and Forestry Sciences, China*

**WEP.P15.114**
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*David De La Fuente, Juan Suarez, Julia Yagüe, Donata Pedrazzani, GMV Aerospace, Spain*

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Board 115 **HYPERSPECTRAL DETECTION DYNAMICS OF ARCHAEOLOGICAL VEGETATION MARKS AND ENHANCEMENT USING FULL WAVEFORM LIDAR DATA**
*David Stott, University of Leeds, United Kingdom; Doreen Boyd, University of Nottingham, United Kingdom; Anthony Beck, Anthony Cohn, University of Leeds, United Kingdom*

**WEP.P15.116**
Board 116 **CROP MAPPING BY SUPERVISED CLASSIFICATION OF HIGH RESOLUTION OPTICAL IMAGE TIME SERIES USING PRIOR KNOWLEDGE ABOUT CROP ROTATION AND TOPOGRAPHY**
*Julien Osman, Jordi Inglada, Jean-François Dejoux, Olivier Hagolle, Gérard Dedieu, Centre d'Études Spatiales de la BIOsphère, France*



## Agriculture: Remote Sensing of Land and Water Management I

Session Co-Chairs: Ruzbeh Akbar, University of Southern California; Sylvia Valero, Centre d'Etudes Spatiales de la BIOsphère (CESBIO)

**WEP.P16.117**
Board 117 **SPATIAL-TEMPORAL ANALYSIS OF FIELD EVAPOTRANSPIRATION BASED ON COMPLEMENTARY RELATIONSHIP MODEL AND IKONOS DATA**
*Guijun Yang, Chunjiang Zhao, Beijing Research Center for Information Technology in Agriculture, Beijing Academy of Agriculture and Forestry Sciences, China; Qingyun Xu, Geographic Science and Institute of Surveying and Mapping, Liaoning Technical University, China*

**WEP.P16.118**
Board 118 **EVALUATION OF INTEGRATED SURFACE DROUGHT INDEX (ISDI) VIA PRECIPITATION DATA AND SOIL MOISTURE**
*Lei Zhou, China National Environmental Monitoring Center, China; Jianjun Wu, Adu Gong, Beijing Normal University, China; Jianhui Zhang, China National Environmental Monitoring Center, China; Ming Liu, Beijing Normal University, China; Lin Zhao, Wuhan University, China; Song Leng, Beijing Normal University, China; Xin Lü, China National Environmental Monitoring Center, China*

**WEP.P16.119**
Board 119 **VARIATION ANALYSIS OF CROP PHENOLOGY IN CHINA FROM 1982 TO 2006 USING TIME SERIES NDVI**
*Xingzhi You, Jihua Meng, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

**WEP.P16.120**
Board 120 **LAND SUITABILITY ASSESSMENT FOR RICE CROP USING GEOSPATIAL TECHNIQUES**
*Mirza Muhammad Waqar, Institute of Space Technology, Pakistan; Faiza Rehman, University of the Pubjab, Pakistan; Muhammad Ikram, Institute of Space Technology, Pakistan*

**WEP.P16.121**
Board 121 **WHEAT YIELD ESTIMATION IN RUSSIA WITH MODIS TIME-SERIES DATA BASED ON LIGHT USE EFFICIENCY MODEL**
*Xin Du, Jihua Meng, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China; Igor Savin, Space Research Institute, Austrian Academy of Sciences, Russian Federation; Qiangzi Li, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China*

**WEP.P16.122**
Board 122 **USE OF HIGH-RESOLUTION MULTISPECTRAL IMAGERY FROM AN UNMANNED AERIAL VEHICLE IN PRECISION AGRICULTURE**
*Manal Al-Arab, Alfonso Torres-Rua, Andres Ticlavilca, Austin M. Jensen, Mac McKee, Utah State University, United States*

## SAR: Image Processing Methods

Session Co-Chairs: Marco Lavalle, NASA Jet Propulsion Laboratory; Marwan Younis, German Aerospace Center (DLR)

**THP.P1.1** Board 1 **A NEW METHOD FOR CONSISTENT INTENSITY ADJUSTMENT ON AZIMUTH IN SAR IMAGES OF LOW ALTITUDE PLATFORMS**
*Xiuqing Liu, Yanfei Wang, Xin Gao, Zhuo Pan, Xueli Zhan, Zhigang Pan, Institute of Electronics, Chinese Academy of Sciences, China*

**THP.P1.2** Board 2 **AN AUTO-REGISTRATION METHOD FOR SPACE-BORNE SAR IMAGES BASED ON FFT-SHIFT THEORY AND CORRELATION ANALYSIS IN MULTI-SCALE SCHEME**
*Yixian Tang, Chao Wang, Hong Zhang, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China; Yongjie He, Beijing Normal University, China*

**THP.P1.3** Board 3 **INVERSE SYNTHETIC APERTURE RADAR IMAGING: AIR-TO-AIR AND AIR-TO-SURFACE EXAMPLES**
*Hubert Cantalloube, Office National d'Etudes et Recherches Aerospatiales, France*



## SAR: Image Processing Applications

Session Chair: Paul Rosen, NASA Jet Propulsion Laboratory

**THP.P2.4** Board 4 **LAKE SHORE EXTRACTION EXPLOITING COMPLEX DECOMPOSITION**
*Fabio Baselice, Giampaolo Ferraioli, Vito Pascazio, Università degli Studi di Napoli Parthenope, Italy*

**THP.P2.5** Board 5 **SHIP WAKE CFAR DETECTION ALGORITHM IN SAR IMAGES BASED ON LENGTH NORMALIZED SCAN**
*Jie Nan, Chao Wang, Bo Zhang, Fan Wu, Hong Zhang, Yixian Tang, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

**THP.P2.6** Board 6 **AN AUTOMATIC DETECTION SYSTEM FOR NATURAL OIL SEEP ORIGIN ESTIMATION IN SAR IMAGES**
*Gopika Suresh, University of Bremen, MARUM (Center for Marine Environmental Sciences), Germany; Georg Heygster, Universität Bremen, Germany; Gerhard Bohrmann, MARUM (Center for Marine Environmental Sciences), Germany; Christian Melsheimer, University of Bremen, Germany; Jan-Hendrik Körber, MARUM (Center for Marine Environmental Sciences), Germany*

**THP.P2.7** Board 7 **TARGET DETECTION ON HIGH-RESOLUTION SAR IMAGE USING PART-BASED CFAR MODEL**
*Chu He, Yu Zhang, School of Electronic Information, Wuhan University, China; Xin Su, Institution Telecom, Telecom Paris, France; Xin Xu, School of Electronic Information, Wuhan University, China; Mingsheng Liao, The State Key Laboratory for Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University, China*

**THP.P2.8** Board 8 **WEATHER RADAR DATA VISUALIZATION USING FIRST-ORDER INTERPOLATION**
*Roman Kvasov, Sandra Cruz-Pol, Jose Colom-Ustáriz, Leyda León Colón, University of Puerto Rico, Mayaguez Campus, Puerto Rico; Paula Rees, University of Massachusetts Amherst, United States*

## Image Classification III

Session Chair: Saurabh Prasad, University of Houston

**THP.P3.9** Board 9 **SUPERVISED LOCALLY LINEAR EMBEDDING BASED DIMENSION REDUCTION FOR HYPERSPECTRAL IMAGE CLASSIFICATION**
*Yushi Chen, Changbo Qu, Zhouhan Lin, Harbin Institute of Technology, China*

**THP.P3.10** Board 10 **CLASSIFICATION ALGORITHM FOR EMBEDDED SYSTEMS USING HIGH-RESOLUTION MULTISPECTRAL DATA**
*Iván Villalón-Turrubiates, ITESO, Universidad Jesuita de Guadalajara, Mexico*

**THP.P3.11** Board 11 **COMPARATIVE ANALYSIS OF CLASSIFICATION ACCURACY FOR RISAT-1 COMPACT POLARIMETRIC DATA FOR VARIOUS LAND-COVERS**
*Varsha Turkar, Shaunak De, Y. S. Rao, Sanjay Shitole, Avik Bhattacharya, Indian Institute of Technology Bombay, India; Anup Kumar Das, Indian Space Research Organisation, India*



## Image Processing III

Session Chair: Sebastiano Serpico, University of Genoa

**THP.P4.12** Board 12 **ASSESSMENT OF THE SATELLITE CHLOROPHYLL ALGORITHMS FOR THE BALTIC SEA**
*Monika Wozniak, Bozena Wojtasiewicz, University of Gdansk, Poland*

**THP.P4.13** Board 13 **STUDY OF TOPSIDE ELECTRON DENSITY PROFILES OBTAINED BY COSMIC SATELLITES AND AN IONOSONDE OVER CYPRUS DURING A FOUR YEAR PERIOD**
*Haris Haralambous, Christina Oikonomou, Frederick Research Center, Cyprus*

**THP.P4.14** Board 14 **GIS DATA INTEGRATION FOR SRTM –LANDSAT ETM+-RADARSAT-1 IMAGES TO DELINEAT SUBSURFACE PALEOLAKES,WADI WATIR AREA, EGYPT**
*Mona Kaiser, Suez Canal University, Egypt*

**THP.P4.15** Board 15 **SHAPE-BASED TIME SERIES ANALYSIS FOR REMOTE PHENOLOGY STUDIES**
*Ricardo Torres, University of Campinas, Brazil; Makoto Hasegawa, Salvatore Tabbone, Université Nancy 2, France; Jurandy Almeida, Jefersson A. dos Santos, University of Campinas, Brazil; Bruna Alberton, Patricia Morellato, São Paulo State University, Brazil*

**THP.P4.16** Board 16 **IMPROVED IMPLEMENTATION OF SUPERPIXEL BASED REMOTE SENSING IMAGE MAPPING**
*Guangyun Zhang, Xiuping Jia, Jiankun Hu, University of New South Wales, Australia*

**THP.P4.17** Board 17 **EFFECT OF BANDWIDTH OF PANCHROMATIC IMAGE ON THE QUALITY OF PANSHARPENED MULTISPECTRAL IMAGE**
*Masayuki Matsuoka, Kochi University, Japan; Hiroki Yoshioka, Aichi Prefectural University, Japan; Kenta Obata, University of Hawaii, United States; Takeo Tadono, Japan Aerospace Exploration Agency, Japan*

## Snow Remote Sensing III

Session Chair: Jiancheng Shi, Institute of Remote Sensing Applications, Chinese Academy of Sciences

**THP.P5.18** Board 18 **DESIGN AND FEASIBILITY OF A DUAL-FREQUENCY SPACEBORNE RADAR SCATTEROMETER FOR GLOBAL SNOW MEASUREMENT**
*Xiaolong Dong, Di Zhu, National Space Science Center, Chinese Academy of Sciences, China*

**THP.P5.19** Board 19 **TEMPORAL SERIES ANALYSIS OF SNOW WATER EQUIVALENT OF SATELLITE PASSIVE MICROWAVE DATA IN NORTHERN SEASONAL SNOW CLASSES (1978-2010)**
*Jiuliang Liu, Zhen Li, Center for Earth Observation and Digital Earth, Chinese Academy of Sciences, China*

**THP.P5.20** Board 20 **TIME SERIES MICROWAVE EMISSION PROPERTIES OF SNOW-COVERED SURFACE IN SOUTH CHINA BOTH USING MODEL SIMULATION AND OBSERVATIONS**
*Lingmei Jiang, Beijing Normal University, China*

**THP.P5.21** Board 21 **VERIFICATION OF A GROUND METEOROLOGICAL FORCING DATASET AND ITS APPLICATION ON PERMAFROST REGION OF QINGHAI-TIBETAN PLATEAU**
*Hao Chen, Zhuotong Nan, Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences, China*



## Ice Sheets and Glaciers II

Session Chair: Jørgen Dall, Technical University of Denmark

**THP.P6.22** Board 22 **RADAR-CODING IN THE APPLICAITON OF SAR IMAGE CLASSIFICATION IN THE DISTRICT OF GLACIERS**
*Fu Sitao, Li Zhen, Tian Bangsen, Xing Qiang, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China*

**THP.P6.23** Board 23 **COMBINING A DIGTIAL ELEVATION MODEL AND THERMAL INFORMATION FOR AUTOMATED GLACIER MAPPING**
*Lili Yan, Jian Wang, Xiaohua Hao, Zhiguang Tang, Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences, China*

**THP.P6.24** Board 24 **MONITORING RECENT VARIATIONS OF THE MOVEMENTS ON THE POLYTHERMAL GLACIERS- A CASE STUDY IN THE NYAINQÊNTANGLHA MOUNTAINS**
*Junchao Shi, Massimo Menenti, Delft University of Technology, Netherlands*

## Sea Ice II

**THP.P7.25** Board 25 **ORIENTATION EFFECTS ON POLARIMETRIC SAR IMAGES OF SEA ICE**
*Armando Marino, ETH Zürich, Switzerland; Irena Hajnsek, ETH Zürich / German Aerospace Center (DLR), Germany*

**THP.P7.26** Board 26 **COMPARISON BETWEEN SAR DERIVED SEA ICE DISPLACEMENT AND HINDCASTS BY THE OPERATIONAL OCEAN MODEL HIROMB**
*Anders Berg, Chalmers University of Technology, Sweden; Lars Axell, Swedish Meteorological and Hydrological Institute, Sweden; Leif E. B. Eriksson, Chalmers University of Technology, Sweden*

**THP.P7.27** Board 27 **CHANGES OF SEA ICE EXTENT IN DIFFERENT REGIONS OF THE BALTIC SEA BASED ON OBJECT-BASED IMAGE ANALYSIS METHODS**
*Aleksandra Katarzyna Mazur, Adam Krezel, Institute of Oceanography, University of Gdansk, Poland*



## GIS Applications II

Session Chair: Meixia Deng, George Mason University

**THP.P8.28** Board 28 **AN EFFICIENT METHOD OF PREDICTING TRAFFIC NOISE USING GIS**
*Jianghua Zhao, Qiming Qin, Chao Xie, Jianhua Wang, Qingye Meng, Institute of Remote Sensing and Geographic Information System, Peking University, China*

**THP.P8.29** Board 29 **WEB SERVICE-BASED VEGETATION CONDITION MONITORING SYSTEM - VEGSCAPE**
*Zhengwei Yang, USDA NASS, United States; Genong Yu, Liping Di, Bei Zhang, Weiguo Han, George Mason University, United States; Rick Mueller, USDA NASS, United States*

**THP.P8.30** Board 30 **A PARALLEL STRATEGY FOR PLANE SWEEP ALGORITHM IN MULTI-CORE SYSTEM**
*Qiang Qiu, Institute of Computing Technology, Chinese Academy of Sciences, China; Xiaomin Zhu, Shandong Computer Science Center, China; Xiangzhen Yao, China Electronics Standardization Institute, China; Jinyun Fang, Institute of Computing Technology, Chinese Academy of Sciences, China*

**THP.P8.31** Board 31 **RESEARCH ON THE COMPOSITION TECHNIQUED OF MARINE GIS MODEL SERVICES**
*Wei Liao, Beijing Research Institute of Oil, China; Yawen He, China University of Petroleum, China; Yunyan Du, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, China*

**THP.P8.32** Board 32 **AUTOMATIC GEOGRAPHIC WEB SERVICE CHAINING BASED-ON IMPROVED AND/OR GRAPH**
*Li Liu, Lei Cao, Jinyun Fang, Institute of Computing Technology, Chinese Academy of Sciences, China; Dui Liang, China Electric Equipment and System Engineering Co. Ltd, China*

**THP.P8.33** Board 33 **A FAST APPROACH FOR SPATIAL CO-LOCATION PATTERN MINING**
*Fei He, Institute of Computing Technology, Chinese Academy of Sciences, China; Xuemin Deng, CNPC Bohai Drilling Engineering Co., Ltd, China; Jinyun Fang, Institute of Computing Technology, Chinese Academy of Sciences, China*

**THP.P8.34** Board 34 **VEHICLE ACCELERATION NOISE: A SOLUTION FOR REAL-TIME HIGHWAY TRAFFIC ESTIMATION BASED ON LOW-SPEED FLOATING VEHICLES**
*Chao Xie, Qiming Qin, Jun Li, Jianghua Zhao, Institute of Remote Sensing and Geographic Information System, Peking University, China*

**THP.P8.35** Board 35 **FAST PARALLEL INTERPOLATION ALGORITHM USING CUDA**
*Yanwei Zhao, Qiang Qiu, Jinyun Fang, Institute of Computing Technology, Chinese Academy of Sciences, China; Liang Li, The Second Academy of Aerospace, China*

## Landslides, Volcanoes and Earthquake

Session Chair: Josee Levesque, Defence Research and Development Canada

**THP.P9.36** Board 36 **SPATIAL AND TEMPORAL DISTRIBUTION OF DISASTER EVENTS IN MOUNTAINOUS TOWNSHIPS OF TAIWAN**
*Chien-Yuan Chen, Department of Civil and Water Resources Engineering, National Chiayi University, Taiwan; Jui-Tang Chiang, Sianghuo Salvage Branch, First Corps, Chiayi County Fire Bureau, Taiwan*

**THP.P9.37** Board 37 **THE MULTITEMPORAL CHANGE ANALYSIS OF DEEP-SEATED LANDSLIDE – HSIAOLIN SLIDE**
*Jin-King Liu, Secretary General/Taiwan Group on Earth Observations and CEO/LIDAR Technology Co., Taiwan; Kuan-Tsung Chang, Feng-Chi Yu, Assistant Professor/Minghsin University of Science and Technology, Taiwan; Chin-Shyong Hou, Chief/Central Geological Survey, Ministry of Economic Affairs, Taiwan; Li-Yuan Fei, Director/Central Geological Survey, Ministry of Economic Affairs, Taiwan*

**THP.P9.38** Board 38 **EARTHQUAKE BUILDING DAMAGE DETECTION WITH OBJECT-ORIENTED CHANGE DETECTION**
*Lixia Gong, Qiang Li, Jingfa Zhang, Institute of Crustal Dynamics, China Earthquake Administration, China*

**THP.P9.39** Board 39 **A STATISTICAL ANALYSIS FOR CHARACTERIZING LANDSLIDE CAUSED BY HEAVY RAINFALL AND SEVERE EARTHQUAKE**
*Kuan-Tsung Chang, Assistant Professor/Minghsin University of Science and Technology, Taiwan; Jin-King Liu, Secretary General/Taiwan Group on Earth Observations and CEO/LIDAR Technology Co., Ltd., Taiwan; Wei-Chen Hsu, Ph.D candidate/National Chiao Tung University and General Manager/LIDAR Technology Co., Ltd., Taiwan; Tian-Yuan Shih, National Chiao Tung University, Taiwan*

**THP.P9.40** Board 40 **GEODYNAMIC ACTIVITY OF MALAYSIA: INSIGHT FROM SPACE-BASED TECHNOLOGY AND KNOWLEDGE DRIVEN APPROACH**
*Rabieahtul Abu Bakar, Tajul Anuar Jamaluddin, Universiti Kebangsaan Malaysia, Malaysia; Kamaludin Mohd Omar, Khamarrul Azahari Razak, Universiti Teknologi Malaysia, Malaysia*

**THP.P9.41** Board 41 **THE DEVELOPMENT OF GREAT EARTHQUAKE RISK ASSESSMENT SYSTEM BASED ON HIGH RESOLUTION GRID DATA**
*Xiang Ding, Xiaoqing Wang, Aixia Dou, Xiaoxiang Yuan, Long Wang, Institute of Earthquake Science, China*

**THP.P9.42** Board 42 **TEMPORAL AND SPATIAL VARIATIONS OF SEISMICITY PARAMETERS FOR NORTHWEST HIMALAYA**
*Madan Mohan Rout, Josodhir Das, Kamal Kamal, Indian Institute of Technology, India*



## Water Related Disasters

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*Frank Lin, Weiwei Zhu, University of Marylamd Eastern Shore, United States; Kingkarn Sookhanaphibarn, Piyarat Silapasuphakornwong, Bangkok University, Thailand*

**THP.P10.44** Board 44 **THE EFFECTIVENESS OF LOW-COST GEOINFORMATICS FOR DISASTER RISK REDUCTION APPLICATIONS IN COASTAL REGIONS**
*Mathias Leidig, Richard Teeuw, Andy Gibson, University of Portsmouth, United Kingdom*

**THP.P10.45** Board 45 **SIMULATION OF TSUNAMI IMPACT ON TAIWAN COASTAL AREA**
*Yang-Lang Chang, Min-Yu Huang, Yi Chun Wang, Wen-Da Lin, Jyh Perng Fang, National Taipei University of Technology, Taiwan; Bormin Huang, University of Wisconsin-Madison, United States; Tung-Ju Hsieh, National Taipei University of Technology, Taiwan*

## Miscellaneous Hazards

Session Chair: Wenjiang Huang, Chinese Academy of Sciences

**THP.P11.46** Board 46 **NON-POINT SOURCE P POLLUTION RISK ASSESSMENT FOR BASIN AREA BASED ON REMOTE SENSING IMAGE**
*Shudong Wang, Xia Zhang, Haitao Zhu, Xiaoping Chen, Tong Shuai, Zhi Zhuang, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China*

**THP.P11.47** Board 47 **OIL SPILL DETECTION USING MULTI FREQUENCY MICROWAVE SENSOR ONBOARD SATELLITE; SSM/I AND AMSR-E**
*Opn Calla, Harendra Dadhich, Shruti Singhal, International Centre for Radio Science, India*

**THP.P11.48** Board 48 **THE INFUENCE OF OIL SPILL AND ENTEROMORPHA ON SYNTHETIC APERTURE RADAR BACKSCATTER COEFFICIENT AND WIND FIELD INVERSION.**
*Jie Guo, Yantai Institute of Coastal Zone Research, Chinese Academy of Sciences, China; Yijun He, Biao Zhang, School of Marine Sciences,Nanjing University of Information Science and Technology, China*

**THP.P11.49** Board 49 **AUTOMATIC ROAD DAMAGE DETECTION USING HIGH-RESOLUTION SATELLITE IMAGES AND ROAD MAPS**
*Haijian Ma, National Earthquake Infrastructure Service, China; Nan Lu, Peking University, China; Linlin Ge, the University of New South Wales, Australia; Qiang Li, Xinzhao You, Xiaoxuan Li, National Earthquake Infrastructure Service, China*

**THP.P11.50** Board 50 **DISCRIMINATING WHEAT APHID DAMAGE LEVEL USING SPECTRAL CORRELATION SIMULATING ANALYSIS**
*Wenjiang Huang, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China; Juhua Luo, Nanjing Institute of Geography and Limnology, Chinese Academy of Sciences, China; Qingsong Guan, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China; Jinling Zhao, Jingcheng Zhang, Beijing Research Center for Information Technology in Agriculture, Beijing Academy of Agriculture and Forestry Sciences, China*

**THP.P11.51** Board 51 **HYPERSPECTRAL IMAGE FOR DISCRIMINATING APHID AND APHID DAMAGE REGION OF WINTER WHEAT LEAF**
*Juhua Luo, Nanjing Institute of Geography and Limnology, Chinese Academy of Sciences, China; Wenjiang Huang, Qingsong Guan, Key Laboratory of Digital Earth Sciences, Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences, China; Jinling Zhao, Zhang Jingcheng, Beijing Research Center for Information Technology in Agriculture, Beijing Academy of Agriculture and Forestry Sciences, China*



## Soil Moisture Retrieval II

Session Co-Chairs: Ruzbeh Akbar, University of Southern California; Alicia Joseph, National Aeronautics and Space Administration

**THP.P13.52** Board 52 **VALIDATION OF AMSR-E SOIL MOISTURE PRODUCT AND THE FUTURE PERSPECTIVE OF SOIL MOISTURE ESTIMATION USING SMOS DATA OVER TROPICAL REGION**
*Chuen Siang Kang, Kasturi Devi Kanniah, Universiti Teknologi Malaysia, Malaysia*

**THP.P13.53** Board 53 **THE REMOTE SENSING QUANTITATIVE MONITORING OF SOIL MOISTURE IN THE UPSTREAM OF MINJIANG VALLEY**
*Yuxia Li, University of Electronic Science and Technology of China, China; Wunian Yang, Chengdu University of Technology, China; Lei He, Ling Tong, University of Electronic Science and Technology of China, China; JianCheng Shi, University of California, Santa Barbara, United States*

**THP.P13.54** Board 54 **IMPROVEMENT OF SOIL MOISTURE MONITORING USING EVI AS A KEY PARAMETER BASED ON TVDI IN THE NORTH CHINA PLAIN**
*Yue Shan, Adu Gong, Yongrong Su, Wenyu Liu, Jing Li, Yunhao Chen, Weiguo Jiang, Beijing Normal University, China*

**THP.P13.55** Board 55 **A SIMPLE METHOD TO DETERMINE THE SOIL MOISTURE SATURATION INDEX FROM REMOTELY SENSED DATA**
*Dianjun Zhang, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, China; Zhao-Liang Li, Key Laboratory of Agri-informatics, Ministry of Agriculture / Institute of Agricultural Resources and Regional Planning, Chinese Academy of Agricultural Sciences, China; Ronglin Tang, Bo-Hui Tang, Hua Wu, Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, China*

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*Lei He, Ling Tong, Yan Chen, Mingquan Jia, University of Electronic Science and Technology of China, China; Jiancheng Shi, University of California, Santa Barbara, United States*

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*Shu Wang, Lingmei Jiang, Beijing Normal University, China; Tianjie Zhao, Institute of Remote Sensing Applications, Chinese Academy of Sciences, China; Juntao Yang, Beijing Normal University, China*

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*Biao Cao, Qinhuo Liu, Yongming Du, Hua Li, Li Li, State Key Laboratory of Remote Sensing Science, Jointly Sponsored by the Institute of Remote Sensing and Digital Earth of CAS and Beijing Normal University, China*

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*Zeng-Lin Liu, Hua Wu, Bo-Hui Tang, Zhao-Liang Li, State Key Laboratory of Resources and Environment Information System, Institute of Geographical Sciences and Natural Resources Research, CAS, China*

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*Haijing Tian, Chunxiang Cao, State Key Laboratory of Remote Sensing Science, Jointly Sponsored by the Institute of Remote Sensing and Digital Earth of CAS and Beijing Normal University, China; Daming Bao, Center of Wetland Conservation and Management, State Forestry Administration, China; Yongfeng Dang, Academy of Forest Inventory and Planning, State Forestry Administration, China; Min Xu, State Key Laboratory of Remote Sensing Science, Jointly Sponsored by the Institute of Remote Sensing and Digital Earth of CAS and Beijing Normal University, China*

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*Cheng Liu, Chunxiang Cao, Haibing Xiang, State Key Laboratory of Remote Sensing Science, Jointly Sponsored by the Institute of Remote Sensing and Digital Earth of CAS and Beijing Normal University, China*

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*Junfeng Gao, Yongnian Gao, Nanjing Institute of Geography and Limnology, Chinese Academy of Sciences, China; Guiye Bao, Zhifeng Jin, Jing Wang, Jiangsu Institute of Land Surveying and Planning, China*

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*Di Liu, Chunxiang Cao, Min Xu, State Key Laboratory of Remote Sensing Science, Jointly Sponsored by the Institute of Remote Sensing and Digital Earth of CAS and Beijing Normal University, China; Yuxing Zhang, Academy of Forest Inventory and Planning, State Forestry Administration, China; Guangren Ma, Centre of Wetland Conservation and Management, State Forestry Administration, China*

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*Muhammad Ali, Carsten Montzka, Agrosphere (IBG-3), Forschungszentrum Juelich GmbH, Germany; Anja Stadler, Institute of Crop Science and Resource Conservation, University of Bonn, Germany; Gunter Menz, Remote Sensing Group, Institute of Geography, University of Bonn, Germany; Harry Vereecken, Agrosphere (IBG-3), Forschungszentrum Juelich GmbH, Germany*



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*Jian Zhao, Chunxiang Cao, State Key Laboratory of Remote Sensing Science, Jointly Sponsored by the Institute of Remote Sensing and Digital Earth of CAS and Beijing Normal University, China; Qun Li, Chinese Center for Disease Control and Prevention, China*

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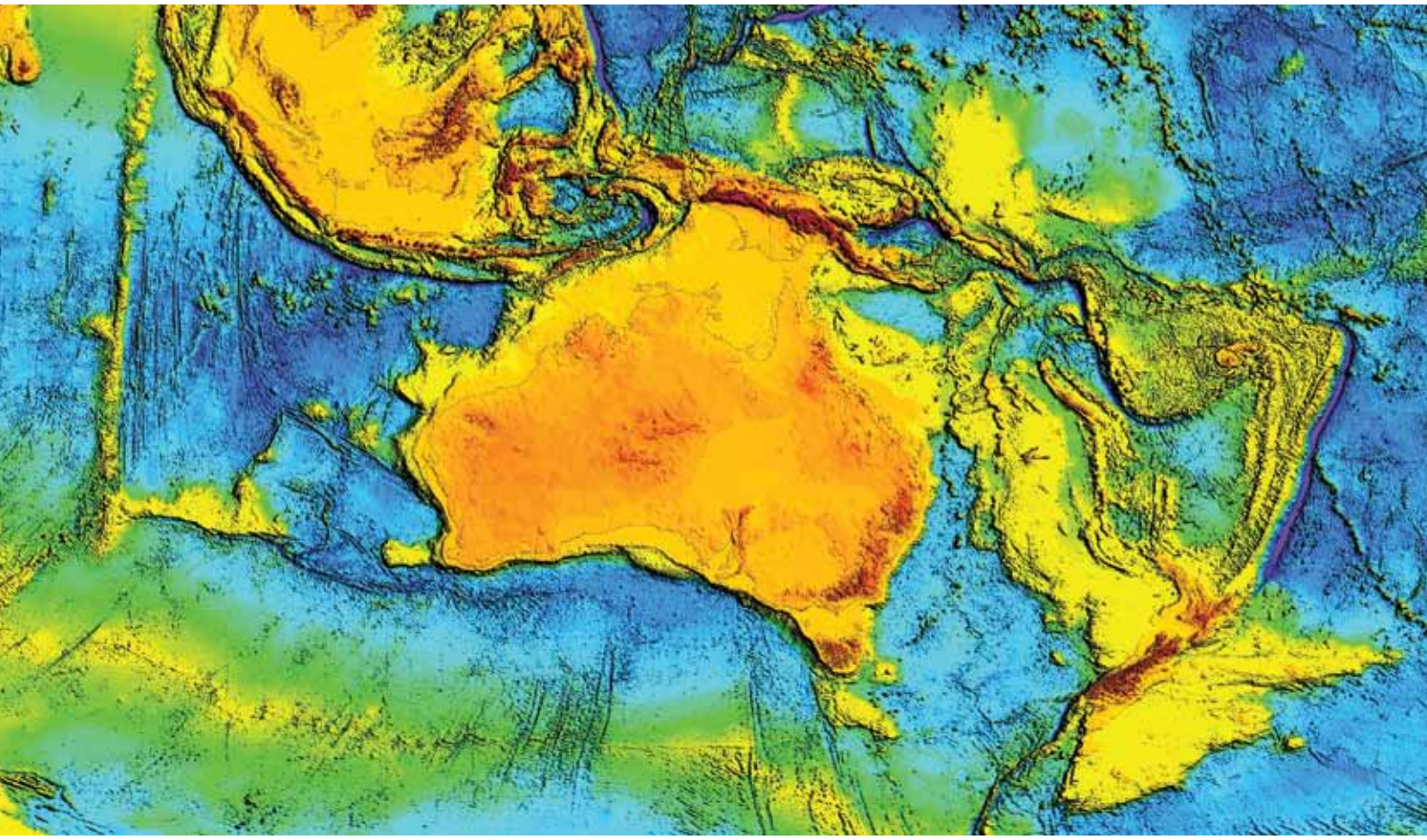

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