



CALL FOR PAPERS

IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing

Special Issue on “Advances in Remote Sensing for Earth Science with Distributed Spacecraft Missions”

A distributed spacecraft mission (DSM) may include dozens or hundreds of small satellites flying in formation or maneuvering with respect to each other to track time-critical events. A DSM can better achieve common goals by allowing for many distributed observations to enable improved spatial, spectral, temporal or angular resolutions. For instance, current instruments measure with low spatial resolution at 250m to 1km (such as on AQUA and TERRA) or with larger time gaps (such as Landsat with a better spatial but rough temporal resolution), but a constellation of low-earth-orbit satellites can provide 10 times improvements in spatial resolution and frequency. The applications of remote sensing through DSMs are profound, ranging from earth imaging to studying short-term weather phenomena (including cyclones and storms) to Heliophysics, Astrophysics and Planetary Science. DSMs are now feasible and affordable with the combination of small spacecraft technologies, instruments and components miniaturization, the availability of various novel launch options, and the advancement of big data analytics. Additionally, rapid advancement of paradigm-shifting technologies such as in-space manufacturing are significantly altering the possibilities for future missions. This includes near-term viability of in-space production of large solar arrays, mesh structures for antennas and other important components that can radically shift the performance and capabilities for remote sensing missions. A critical area of supporting technology is artificial intelligence, relying less on ground stations staffed by human operators around the clock and, instead, uses autonomy software for on-board processing, on-board decision making and even cross-satellite dynamic tasking.

This special issue will explore benefits and limits of DSM, focus on currently operational and planned DSM, and will highlight the technologies and applications of these emerging systems that are opening up new frontiers in Earth observation, space weather, etc. Specifically, papers are solicited on the following topics:

- New earth science missions and applications of distributed spacecraft missions
- Emerging architectures and concepts for distributed and federated missions
- New launch systems and deployment technologies for distributed missions
- Advances in spacecraft miniaturization
- Inter-satellite links and cooperation in distributed spacecraft missions
- Distributed and scalable data management and on-board processing
- Advances in spacecraft communication systems for distributed missions
- General Constellation missions
- Autonomy and artificial intelligence for intelligent and collaborative constellations
- Constellation operations and corresponding ground systems
- In-space manufacturing and servicing for distributed missions
- Cost modeling and analysis of distributed missions
- Risk assessment and evaluation for distributed spacecraft missions
- Model-Based System Engineering for designing and developing distributed missions

Schedule

April 30, 2019 Full paper submission deadline
March 2020 Publication date

Format

All submissions will be peer reviewed according to the IEEE Geoscience and Remote Sensing Society guidelines. Submitted articles should not have been published or be under review elsewhere. Submit manuscript on <http://mc.manuscriptcentral.com/jstars>, selecting the “**Distributed Spacecraft Mission**” special issue manuscript type. Please consult the site <http://www.grss-ieee.org/publication-category/jstars/> for guidelines and information on paper submission. All submissions must be formatted using the IEEE standard format (double column, single spaced) http://www.ieee.org/publications_standards/publications/authors/author_templates.html. Please note that IEEE J-STARS applies a mandatory page over length charge of \$200 per page for IEEE GRSS members and \$230 per page for non-members (beginning with page 7 and beyond).

Guest Editors

Dr. Jacqueline Le Moigne, NASA Earth Science and Technology Office, USA (j.lemoine-stewart@nasa.gov)
Dr. Afreen Siddiqi, Massachusetts Institute of Technology, USA (siddiqi@mit.edu)
Prof. Olivier de Weck, Massachusetts Institute of Technology, USA (deweck@mit.edu)