

# Riccardo Lanari

IREA-CNR

## BIOGRAPHY

Riccardo Lanari was born in Napoli, Italy, in 1964 and graduated in 1989, summa cum laude, in Electronic Engineering at the University of Napoli, Federico II. In the same year, following a short experience at ITALTEL SISTEMI SPA, he joined IRECE and after IREA, a Research Institute of CNR (the Italian National Council of Research), where he currently occupies the position of senior researcher. His main research activities are in the Synthetic Aperture Radar (SAR) data processing field as well as in SAR interferometry techniques; on this topic he holds two patents, has authored more than 60 international journal papers and, in 1999, the book entitled "Synthetic Aperture Radar Processing", written in collaboration with prof. Giorgio Franceschetti and edited by CRC-PRESS. Riccardo Lanari has been a visiting scientist at different foreign research institutes, including the Institute of Space and Astronautical Science (ISAS), Japan (1993), the German Aerospace Research Establishment (DLR), Germany (1991 and 1994) and the Jet Propulsion Laboratory (JPL), USA (1997, 2004 and 2008), where he received a NASA recognition for the technical developments related to the SRTM mission.

Riccardo Lanari is a senior member of the IEEE society and he has served as chairman and technical program committee member at several international conferences. Moreover, he acts as reviewer of several peer reviewed international journals. Riccardo Lanari has lectured in several national and foreign universities and research centers; he has been adjunct professor of Electrical Communication at the l'Università del Sannio (Benevento) from 2000 to 2003 and, from 2000 to 2008, lecturer of the SAR module course of the International Master in Airbone Photogrammetry and Remote Sensing, offered by the Institute of Geomatics in Barcelona (Spain).

## TITLE

**Differential SAR Interferometry: basic principles, key applications and new advance.**

## ABSTRACT

Differential SAR Interferometry (DInSAR) is a microwave imaging technique that permits to investigate earth surface deformation occurring in an area of interest with a centimetre (in some cases millimetre) accuracy. In particular, the DInSAR technique exploits the phase difference (interferogram) of temporally separated SAR images relative to the investigated zone and has already shown its capability in detecting surface deformation caused by different natural and anthropogenic phenomena. The aim of this talk is to introduce the basic concepts involved in the DInSAR technique, summarize the key applications of this method and present its new advance. In particular, a discussion on the rationale of the DInSAR approach will be given first, highlighting the key points and the main limitations. Several examples will be presented for underlining the capability of the technique to analyze the displacements caused by different phenomena such as volcano deformation, earthquakes and urban subsidence. Subsequently, the talk will be focused on the

advanced DInSAR techniques allowing to analyze the temporal evolution of the detected displacements through the generation of deformation time-series computed from a data set of temporarily separated SAR images. Finally, the advance brought in by the new generation X-band spaceborne SAR sensors, characterized by higher spatial resolution and shorter revisit times with respect to the earlier C-band systems, will be discussed, emphasizing the new investigation possibilities for fast varying deformation phenomena.

## CONTACT INFORMATION

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