Duration: 08:30 - 17:50
Room: Budapest

SF-01
Synthetic Aperture Radar (SAR)

Organiser:
Alberto Moreira, German Aerospace Center (DLR), Germany

Abstract
This short course is well suited for engineers and researchers interested in learning theory, techniques, technologies, new concepts, and applications related to synthetic aperture radar (SAR) systems. Today, SAR systems are generating images of the Earth surface with unprecedented resolution and accuracy. Due to their ability to produce high-resolution radar images independent of sunlight illumination and weather conditions, SAR systems have demonstrated their outstanding capabilities for a multitude of applications. Examples are geoscience and climate change research, environmental and Earth system monitoring, 2-D and 3-D mapping, change detection, 4-D mapping (space and time), security-related applications, and planetary exploration.

This short course starts with an overview of the principles, theory and applications of SAR systems. The second lecture will focus on SAR interferometry and will cover the design and system aspects of the mission TanDEM-X, the first radar interferometre in space that employs two satellites operating in a closely controlled formation flight. The third lecture provides an overview of the detection of moving targets with multi-channel SAR systems, including advanced algorithms for motion velocity estimation. The fourth lecture will present several advanced concepts for future spaceborne SAR systems and missions, like digital beamforming, MIMO, and multistatic SAR.

Programme

08:30 - 10:10 SAR Principles, Theory and Applications
Marwan Younis, German Aerospace Center (DLR), Germany

10:10 - 10:50 Break

10:50 - 12:30 SAR Interferometry and TanDEM-X
Paola Rizzoli, German Aerospace Center (DLR), Germany

12:30 - 13:50 Break

13:50 - 15:30 Moving Target Indication (MTI) with SAR
Stefan Baumgartner, German Aerospace Center (DLR), Germany

15:30 - 16:10 Break

16:10 - 17:50 Advanced Spaceborne SAR Concepts
Gerhard Krieger, German Aerospace Center (DLR), Germany