



## Radar in Space – Engineering Marvels Unleashed

Talk by Ulrich Steinbrecher and Markus Bachmann, Germany

Thursday, February 13th, 2025, 15:45 p.m. – 17:15 p.m., NTI lecture hall (Geb. 30.10)

Radar technology has paved the way for groundbreaking advancements in geoscience and environmental monitoring. The TerraSAR-X and TanDEM-X missions have been key contributors to this domain, operating successfully in orbit for nearly 18 years. This talk will provide insights into the fascinating world of satellite radar systems, the daily work of engineers in this field, and the innovative techniques they employ, such as radar interferometry, to generate digital elevation models. Attendees will gain a comprehensive understanding of how advanced radar systems contribute to geoscience and their potential for the future.

**Ulrich Steinbrecher** received the Dipl.-Ing. degree in electrical engineering/communication from the University of Siegen, Siegen, Germany, in 1990. In 1990, he started his career with the German Aerospace Center, Wessling, Germany, with the development of a SAR raw data simulator. Then, he was in software development with the X-SAR Processor and with the joint U.S.–Italian–German SIR-C/XSAR Missions in 1994. When the data were in house, he concentrated on aspects of the operational SAR processing of high data volumes. In 1995, he pioneered a completely automatic SAR processing system based on a robot maintained mass memory archive. Before he became responsible for the development of the raw data analysis and screening system for the shuttle radar topography mission, he developed the software for a phase-preserving ScanSAR processor for Radarsat-1. In the time between the SRTM mission and the start of the TerraSAR-X project, he left the SAR domain for two years and contributed to the SCIAMACHY LIMB processing system. Since 2002, he has been concerned with the TerraSAR-X radar system, and since the launch of the satellite, in 2007, he is responsible for TerraSAR-X instrument operations. In the years 2015-2022 he was responsible for the development of the bistatic SAR Instrument operation for the Tandem-L and ROSE-L Studies.

**Markus Bachmann** received the Dipl.-Ing. degree from the Technical University of Karlsruhe, Germany, in 2005 and the PhD degree in electrical engineering from the Karlsruhe Institute of Technology, Germany, in 2015. In 2005, he joined the Microwaves and Radar Institute, German Aerospace Center. From 2005 to 2011, he was in charge of the calibration of the TerraSAR-X/TanDEM-X antenna model. From 2008 to 2012, he was responsible for the planning and execution of the TanDEM-X commissioning phase and was in charge of the interferometric calibration and global monitoring of the TanDEM-X mission. Since 2012, he leads the “mission engineering” group which is responsible for the TanDEM-X instrument, instrument operations, system performance monitoring and acquisition planning. The group furthermore develops future SAR mission concepts and advanced observation strategies.

The event is co-organized by the IEEE Student Branch Karlsruhe

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