

## Special Issue

# Laser Altimetry and 3D Mapping in Planetary Exploration: Methods and Applications

### Message from the Guest Editors

In the past decades, from the Mars Orbiter Laser Altimeter (MOLA) and Mercury Laser Altimeter (MLA) to the Lunar Orbiter Laser Altimeter (LOLA) and the BepiColombo Laser Altimeter (BELA), laser altimeters have played vital roles in planetary mapping and exploration, providing accurate, abundant, and accessible 3D measurements. Unlike image-based photogrammetry, laser altimetry can overcome the lack of illumination in planetary observation, and provide relatively accurate vertical measurements in comparison to radarmetry with cost-effective instruments and platforms, which is desirable for mapping permanently shadowed regions (PSRs). Beyond planetary exploration, laser altimeters and LiDAR are also employed in the exploration and mapping of asteroids. For example, the NEAR Laser Rangefinder (NLR) and OSIRIS-REx Laser Altimeter (OLA) were introduced to map the shape of the asteroids. For the missions of Hayabusa 1 and 2, LiDAR systems were also equipped for navigation in the touch-down phase and employed in the 3D shape mapping of the asteroids.

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### Guest Editors

Dr. Yusheng Xu

Department of Photogrammetry and Remote Sensing, Technical University of Munich, 80333 Munich, Germany

Prof. Dr. Huan Xie

College of Surveying and Geo-Informatics, Tongji University, 1239 Siping Rd., Shanghai 200092, China

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*Remote Sensing*  
MDPI, Grosspeteranlage 5  
4052 Basel, Switzerland  
Tel: +41 61 683 77 34  
[remotesensing@mdpi.com](mailto:remotesensing@mdpi.com)

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### Editor-in-Chief

Dr. Prasad S. Thenkabail

Senior Scientist (ST), U. S. Geological Survey (USGS), USGS Western Geographic Science Center (WGSC), 2255, N. Gemini Dr., Flagstaff, AZ 86001, USA

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