Activities in Planetary Geodesy / Cartography at the German Aerospace Center (DLR) and the Technical University, Berlin

J. Oberst [1) 2)] , B. Giese 1), M. Wählisch [1)], F. Scholten [1)], K. Gwinner [1)], F. Preusker [1)], S. Elgner [1)], K. Willner [1)], P. Saiger [1)], H. Hussmann [1)], J. Flohrer [1)], B. Brinkmann [1)], H. Lehmann [2)] , J. Albertz [2)]

[1)] German Aerospace Center, Institute of Planetary Science, Planetary Geodesy Department, Rutherfordstrass 2, 12489 Berlin, Germany
[2)] Technical University Berlin, Institute of Geodesy and Geoinformation Sciences, Straße des 17. Juni 135, 10623 Berlin, Germany

Size, shape, rotation, and gravity field are fundamental properties of any planetary body. The Planetary Geodesy Department of the German Aerospace Center (DLR) Institute of Planetary Research, located in the German Capital Berlin is concerned with the determination and the detailed study of these properties, including how they might affect geophysical processes. The general science goals of planetary geodesy are:
- Definition of reference systems
- Determination of rotation parameters, including effects of precession and libration
- Establishment of planetary geodetic control point networks
- Establishment of global and local three-dimensional surface representations
- Creation of geocoded image data, as well as maps and atlases
- Development of Planetary GeoInformation Systems

In this context, the specific tasks of the Department are the photogrammetric processing and analysis of data from
- the HRSC (High Resolution Stereo Camera) on the European Mars Express spacecraft,
- airborne sensors (e.g. HRSC-AX, ADS40)
- the ISS- camera on the Cassini spacecraft currently orbiting Saturn, and
- the MDIS camera on NASA's MESSENGER mission to Mercury

as well as assisting in the analysis of Laser altimeter data for MESSENGER and JAXA's SELENE spacecraft which recently entered Lunar orbit.

The Geodesy Department is also involved in the preparation of the future ESA cornerstone mission BepiColombo to planet Mercury, in particular, the planning for the operation, processing and analysis of the data from the onboard instrument BELA (BepiColombo Laser Altimeter). The Department supports the design and construction of the Laser Altimeter with scientific consulting. The Department is also involved in the design and planning of future planetary missions of the ESA cornerstone program, as well as in the planning of a possible national Lunar Exploration Orbiter (LEO) mission.
Beyond these activities, the Department operates the cameras in Germany for the European Fireball Network and is involved in the geometric calibration, the data processing and trajectory determination for the meteor camera project SPOSH (Smart Panoramic Optical Sensor Head).
The Department has strong ties to the Technical University Berlin, where a new Masters program "Geodesy and Geoinformation Sciences" has recently been established. The curriculum (with its language of instruction being English) has a strong focus on Space and Planetary Geodesy and invites young international

students to take a look at the exciting world of Solar System Planets and to get involved in current planetary missions.
In the full paper and in the Conference presentation, details on our projects will be discussed, and many examples of recent work will be presented.