EP 10: Planets and Small Bodies I

Zeit: Donnerstag 11:00–12:00 Raum: HS-Ost Pharmazie

Hauptvortrag EP 10.1 Do 11:00 HS-Ost Pharmazie

Venus Express: a fascinating journey to our planet-neighbour — •Dmitry Titov[1] and Håkan Svedhem[2] — [1]Max Planck Institute for Solar System Research, Katlenburg-Lindau, Germany — [2]ESA/ESTEC, Noordwijk, The Netherlands

Venus Express is the first European (ESA) mission to the planet Venus. It aims at the global and long-term remote and in-situ investigation of the atmosphere, the plasma environment, and some surface properties from orbit. The spacecraft, based on the Mars Express bus modified for the conditions at Venus, provides a versatile platform for nadir and limb observations as well as solar, stellar, and radio occultations. The payload includes a powerful suite of remote sensing imagers and spectrometers, instruments for in-situ analysis of the circumplanetary plasma, and a radio science experiment. Since April 2006 Venus Express has been performing detailed investigation of (1) the atmospheric structure by infrared remote sensing and radio and solar occultation techniques; (2) the composition and chemistry by nadir and occultation spectroscopy, including observations of the Venus lower atmosphere on the night side; (3) the cloud morphology and atmospheric dynamics by imaging the planet at different wavelengths; (4) the plasma environment and escape processes by measuring density and fluxes of energetic neutral atoms, ions, and electrons and magnetic field; (5) the surface by thermal mapping and bi-static radar sounding. The Venus Express observations provide a new and deep insight in the physics of our mysterious sister-planet and significantly contribute to the field of comparative planetology.

Hauptvortrag EP 10.2 Do 11:30 HS-Ost Pharmazie

The little-known small volcanoes of Mars — •Ernst Hauber — DLR-Institute of Planetary Research, Rutherfordstr. 2, 12489 Berlin

Huge volcanoes with diameters of >>100 km are well known from Mars. However, the planet‘s two largest volcanic provinces, Tharsis and Elysium, are also strewn with hundreds of small shield volcanoes, with diameters of several kilometers to tens of kilometers and heights of only a few hundred meters. These low shields are hard to detect in low-resolution images, and they only became accessible for analysis after the acquisition of high-resolution images and topographic data in the last few years. They are characterized by radial patterns of lava flows and extremely shallow flank slopes of typically <0.5°, indicating low-viscosity lavas. Many other volcanic features are associated with the low shields, such as craters, fissure vents, cinder and spatter cones, lava flows, which are commonly associated with lava channels and tubes, lava inflation features, and volcanic rift zones, all of which have terrestrial analogs in basaltic volcanic provinces. The distribution of low shields does not show any obvious association with large-scale tectonic features. The low shields might represent a recent type of volcanism, which is not related to mantle plumes, but to a zone of partial melting in an anomalously warm mantle underneath a thickened crust.