

Geowissenschaftliches Kolloquium

Magmatic and Volcanic Evolution of Mars from Mineralogy

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The processes responsible for the formation of the crust and of the upper mantle of a large planetary body can include the formation and the solidification of a magma ocean, the density stratification and overturn, large-scale convection, and volcanic activity. These processes are expected to produce distinct mineral assemblages across its surface. Compositional investigations of Mars with various remote sensing, in situ observations and petrology of Martian Meteorites have revealed a wide diversity of igneous minerals, but a relatively uniform surface composition. It was thought to result from an unremarkable magmatic history. However, this is questioned by recent observations and analyses of the surface of Mars in the near-infrared wavelength range using imaging spectrometers on board NASA/Mars Reconnaissance Orbiter and ESA/Mars Express satellites. I will focus my talk on three findings:

- Olivine spatial distribution;
- Search for source regions of the Martian magma origin;
- Anorthosite detection (see picture).

The implications on the volcanic and magmatic history of Mars of these findings will be discussed.

François Poulet is an astronomer at Institut d'Astrophysique Spatiale (Orsay, France). He studies the composition of planetary surface of various bodies including Mars, Satellites of Jupiter and Saturn, and Mercury through his involvement in the planetary space missions such ESA/Mars Express, ESA/BEPI-COLOMBO, ESA/JUICE and NASA/Mars Reconnaissance Orbiter.

