



Physics Colloquium

Friday, January 21, 2011, 4:00 pm, PS 3046

Dr. Gregor Golabek

Institute of Geophysics, Department of Earth Sciences, ETH Zurich

Core and early crust formation on Mars

One of the most striking surface features on Mars is the crustal dichotomy. The crustal dichotomy, a large difference in elevation and crustal thickness between the southern highlands and the northern lowlands, is the oldest geological feature on Mars and was formed more than 4.1 Ga ago. In order to find an internal origin of the crustal dichotomy, located within the geological constraints, the thermal state of the planet resulting from iron core formation needs to be considered. We suggest that the sinking of iron cores delivered by impacting bodies induced thermal anomalies in the mantle that fostered the formation of early Martian crust. Thus, the crustal thickness distribution would largely be a result of planetary core formation, late impact history and the onset of mantle convection. To test this hypothesis we use numerical models to simulate the formation of the Martian iron core and the resulting mantle convection pattern.