

Wednesday, September 12, 2012
HIGH-PRESSURE STUDIES OF THE MARTIAN MANTLE
8:30 a.m. Lecture Hall

High-pressure studies of melting and phase equilibria help to constrain models for the evolution of the martian mantle

Chairs: Yingwei Fei
Kevin Righter

Dasgupta R. * [Invited 20-minute talk]

[*Is Martian Mantle too Reduced to Allow Carbonated Silicate Melt Generation?*](#) [#6013]

Recent experimental calibration on the stability of carbonated magma as a function of oxygen fugacity and new experiments on terrestrial systems are used to discuss the possible stability of carbonated silicate melt in the martian mantle.

Filiberto J. * Dasgupta R. [Contributed 15-minute talk]

[*Constraints on the Depths and Thermal Vigor of Basalt Formation in the Martian Mantle*](#) [#6019]

Here we use experimental petrology and geochemical modeling to predict the pressures and temperatures of basalt formation for the ancient surface basalts from Gusev Crater and Meridiani Planum and the younger shergottites.

Collinet M. * Médard E. Vander Auwera J. Charlier B. [Contributed 15-minute talk]

[*Anhydrous Melting of a Primitive Martian Mantle: New Experiments at 1–2 GPa*](#) [#6031]

Experimental liquids present both similarities and differences with basalts from the martian surface. They are used to discuss the diversity of basaltic magmatism and mantle sources on Mars.

BREAK [15 minutes]

Rapp J. F. * Draper D. S. [Contributed 15-minute talk]

[*Crystallization of Y980459 at 0.5 GPa: Are Residual Liquids Similar to QUE 94201*](#) [#6027]

Experiments on Y980459 suggest that although it may sample a geochemically similar mantle source to QUE 94201, QUE is not simply a more evolved product of such a magma source.

Agee C. * [Invited 20-minute talk]

[*Heterogeneous Mars: Evidence from New Unique Martian Meteorite NWA 7034*](#) [#6041]

The NWA 7034 meteorite is a geochemically enriched crustal rock bearing a striking compositional and average martian crust measured by recent NASA rover and orbiter missions.

Rai N. * van Westrenen W. [Contributed 15-minute talk]

[*Metal-Silicate Partitioning of Siderophile Elements: Application to Core-Mantle Differentiation in Mars*](#) [#6026]

Based on recent advances in our understanding of siderophile-element metal-silicate partitioning and availability of new experimental results on metal-silicate partitioning of elements at high P-T conditions, we model conditions of core-mantle differentiation in Mars.

Righter K. * Humayun M. [Contributed 15-minute talk]

[*Siderophile Element Constraints on the Conditions of Core Formation in Mars*](#) [#6037]

Siderophile-element contents in the martian mantle record a high pressure and temperature (14 GPa, 2200 K) metal-silicate equilibrium that suggests Mars experienced a simple continuous core formation and growth process compared to models for Earth.