

Friday, July 28, 2017
MARTIAN METEORITES II
8:30 a.m. Sweeney A

This session provides insights into the origin of martian meteorites on Mars and the surface processing that they record from impact processes to the nature of the martian climate.

Chairs: Robina Shaheen
Desmond Moser

- 8:30 a.m. Lapen T. J. * Irving A. J. Righter M.
[Magmatism on Mars: Mantle Depletion and Possibly Long-Term Mixing](#) [#6371]
 The ejection ages of martian meteorites have been used to link groups of meteorites to common pre-launch locations on Mars. These spatial relationships provide insights into magmas produced from particular magmatic centers.
- 8:45 a.m. Prissel T. C. * Gross J. Draper D. S.
[Origin of Olivine-Phyric Shergottites](#) [#6338]
 We apply Al-in-Olivine geothermometry to (1) address competing petrogenetic models regarding enriched and depleted olivine-phyric shergottites, and (2) assess mantle heterogeneity (or lack thereof) within the martian interior.
- 9:00 a.m. Melwani Daswani M. * Heck P. R. Greber N. D. Greenwood R. C.
[Petrography and Geochemistry of Northwest Africa 11115: A New, Enriched, High Thorium Basaltic Shergottite](#) [#6302]
 NWA 11115 is a recently found enriched basaltic shergottite. It has an unusually low K/Th ratio compared to other martian meteorites and the surface of Mars. Large phosphate grains may be the hosts of the Th enrichment.
- 9:15 a.m. Righter M. * Lapen T. J. Irving A. J. Andreasen R.
[Trace Elements and Lu-Hf Systematics on Shergottite Northwest Africa 4480](#) [#6321]
 We present *in-situ* trace element analyses and Lu-Hf systematics of unique shergottite NWA 4480.
- 9:30 a.m. Irving A. J. * Kuehner S. M. Gao Y. Righter M. Lapen T. J. Hoefnagels B.
[Petrology and Bulk Composition of Ultramafic Olivine-Orthocumulate Shergottite Northwest Africa 11261](#) [#6345]
 We describe an unusual martian meteorite with olivine-orthocumulate texture and will report on its trace element and radiogenic isotope characteristics.
- 9:45 a.m. Herd C. D. K. * Tornabene L. L. Bowling T. J. Walton E. L. Sharp T. G. Melosh H. J.
[New Insights into Source Craters for the Martian Meteorites](#) [#6334]
 We use results from the shock metamorphism of four representative samples (Zagami, Tissint, Chassigny, and NWA 8159) with new impact modeling and a database of fresh craters to constrain the potential source craters for the martian meteorites.
- 10:00 a.m. Moser D. E. * Reinhard D. A. Larson D. J. Darling J. R. White L. F. Arcuri G. Irving A. J.
[A 4.43 Ga Minimum Age for Mars-Shaping Impact Deduced from Microstructural Geochronology of Meteoritic Zircon and Baddeleyite](#) [#6301]
 A minimum age of the Mars-shaping impact event is proposed based on the microstructural state of U-Pb geochronology minerals zircon and baddeleyite in Rabt Sbayta meteorites such as polymict breccia NWA 7475.

- 10:15 a.m. Hu S. * Lin Y. T. Zhang T. Gu L. X. Tang X.
[Discovery of First Coesite in the Martian Meteorite Northwest Africa 8657](#) [#6152]
Two types of occurrence of coesite were identified in martian meteorite NWA 8657, probably crystallized from impact melt under pressure <14 GPa and temperature >2800 K.
- 10:30 a.m. Takenouchi A. * Mikouchi T. Yamaguchi A.
[Comparison of Shock Induced Lamellar Texture in Olivine Between Martian Meteorites and Experimentally Shocked Basalt](#) [#6213]
We observed shock induced lamellae in olivine from martian meteorites by TEM and compared with those in experimentally shocked basalt. We found that the lamellar texture changes depending on different post shock thermal histories.
- 10:45 a.m. Lee M. R. * Cohen B. E. Mark D. F. Boyce A.
[Multiphase Aqueous Alteration of the Nakhilite Northwest Africa 817](#) [#6186]
The nakhilite meteorite Northwest Africa 817 has been aqueously altered on both Mars and Earth, producing clays, carbonates, sulphates and oxides. The challenge is to see through the terrestrial overprint to understand the martian signature.
- 11:00 a.m. Bishop J. L. * Velbel M. A.
[Comparison of Phyllosilicates Observed on the Surface of Mars with Those Found in Martian Meteorites](#) [#6115]
Comparing the phyllosilicates observed on the surface of Mars today with those found in martian meteorites may provide clues toward understanding which phyllosilicates formed in surface environments and which formed through subsurface processes.
- 11:15 a.m. Shaheen R. * Smirnova V. Jackson T. Thiemens M. H.
[Oxygen Isotope Anomalies of Silicate Minerals Reveal Past and Present History of Mars Atmosphere and Implications for the Mars Sample Return](#) [#6386]
NWA 7034 showed twice O-isotope anomaly compared to other meteorites from Mars. Mechanisms on how these minerals can acquire anomalies are discussed. Laboratory experiments simulating Mars atmosphere-hydrosphere-geosphere interactions are presented.