Tuesday, March 17, 2015
GEOCHEMISTRY AND PETROLOGY OF MARTIAN METEORITES
8:30 a.m.   Waterway Ballroom 4

Chairs: Aaron Bell
         Minako Righter

8:30 a.m. Hewins R. H. * Zanda B. Pont S. Humayun M. Assayag N. et al.
NWA 8694, a Ferroan Chassignite [2249]
NWA 8694 has olivine Fo53, intermediate to Chassigny and nakhlites. Although chassignites are
fractionated and distinct in Fe/Mg, the REE concentrations overlap.

8:45 a.m. Balta J. B. * McSween H. Y. Tucker K. Wadhwa M.
Petrology and Geochemistry of New Antarctic Shergottites: LAR 12011, LAR 12095, and LAR 12240 [2294]
Characterization of three new Antarctic shergottites. LAR 12011 is paired with LAR 06319, LAR 12095 and LAR 12240, are paired and their petrogenesis is characterized.

9:00 a.m. Castle N. * Herd C. D. K.
Petrogenesis of the LAR 12095/12240 Martian Meteorite: Comparisons with Tissint and Other
Depleted Olivine-Phyric Shergottites [1975]
We demonstrate that LAR 12095 is similar to other olivine-phyric shergottites in terms of REE pattern, bulk Mg#, and redox history.

9:15 a.m. Righter M. * Andreasen R. Lapen T. J.
Lu-Hf and Sm-Nd Systematics of Martian Meteorites Larkman Nunatak 12011 and 12095 [2889]
We present Sm-Nd and Lu-Hf isotopic data of two newly found martian meteorites, enriched
shergottite LAR 12011 and depleted shergottite LAR 12095.

9:30 a.m. Tait K. T. * Day J. M. D. Liu Y.
Update on Highly-Siderophile Element Abundances and Re-Os Isotopic Systematics of
Martian Meteorites [2138]
We report new 187Re/187Os and highly siderophile element abundances, along with complementary
major- and trace-element abundance data on nine shergottites.

High-Precision 182W Measurements of Martian Meteorites for Constraining the Early
Evolution of Mars [1928]
We report the first results of a high-precision W isotope study of martian meteorites aimed at assessing
the full extent of 182W variability within Mars.

10:00 a.m. Kayzar T. M. * Borg L. Kruijer T. S. Kleine T. Brennecka G. et al.
Neodymium and Tungsten Isotope Systematics of Mars Inferred from the Augite Basaltic
Meteorite NWA 8159 [2357]
Neodymium and tungsten compositions of NWA 8159 differ from nakhlite, shergottite, and Chassigny
compositions. We relate NWA 8159 evolution to martian planetary differentiation.

10:15 a.m. Andreasen R. * Lapen T. J. Righter M. Irving A. J.
Constraints on the Isotopic Composition of the Shergottite Mantle Sources — From Observation Based
on the Expanding Rock Record [2976]
The Rb/Sr, Lu/Hf, and Sm/Nd source characteristics of shergottites are evaluated in terms of the
constraints on the mantle source composition.
10:30 a.m. Shearer C. K. * Bell A. S. Burger P. V. McCubbin F. M. Agee C. et al.  
The Mineralogical Record of $fO_2$ Variation and Alteration in Northwest Africa 8159 (NWA 8159), Evidence for the Interaction Between a Mantle Derived Martian Basalt and a Crustal Component(s) [#1483]

The unique characteristics of NWA 8159 provide an additional perspective for deciphering the petrogenesis of martian basalts and the nature of the martian crust.

10:45 a.m. Bell A. S. * Burger P. V. Shearer C. K. Papike J. J.  
Decoding the Redox History Recorded in the Olivine Megacrysts of Y98 with Chromium K-Edge XANES [#2421]

Cr valence in olivine can serve as a high fidelity recorder of the Cr valence ratio and the $fO_2$ of the melt from which it grew.

11:00 a.m. Santos A. R. * Agee C. B. McCubbin F. M. Shearer C. K.  
Petrology of Iron, Titanium, and Phosphorus Rich Clasts Within Martian Meteorite Northwest Africa 7034 [#1941]

We have characterized igneous clasts within martian meteorite NWA 7034 derived from a lithology similar to terrestrial FTP rocks to examine their petrogenesis.

11:15 a.m. MacArthur J. L. * Bridges J. C. Hicks L. J. Gurman S. J.  
The Thermal and Alteration History of NWA 8114 Martian Regolith [#2295]

Using SEM, EPMA, XANES to determine the thermal history of a large regolith blanket on Mars; finding oxidation by fluid at high temperature with slow cooling.

11:30 a.m. Leroux H. * Marinova M. Jacob D. Hewins R. H. Zanda B. et al.  
A TEM Study of the Fine-Grained Material of the NWA 7533 Martian Regolith Breccia [#1832]

The matrix of NWA 7533 is a submicrometer granoblastic assemblage, partly sintered. The grain boundaries show evidence for a late-stage destabilization.

11:45 a.m. Cassata W. S. * Borg L. E.  
$^{40}$Ar/$^{39}$Ar Systematics of Shergottite NWA 4468 [#2742]

Ar isotope data from NWA 4468 yield an age of 188 ± 8 Ma and are used to illustrate the sensitivity of some Shergottite $^{40}$Ar/$^{39}$Ar ages to cosmogenic corrections.