Tuesday, March 20, 2012
POSTER SESSION I: HIGH-TEMPERATURE MARTIAN GEOCHEMISTRY
6:00 p.m. Town Center Exhibit Area

Ody A. Poulet F. Langevin Y. Bibring J.-P. Gondet B. Loizeau D.
Evidence for Analogue Mineralogical Site at Mars to the Los Angeles Basaltic Shergottite **[#2350]**
We identify, map, and characterize possible analogue source regions for the SNC martian meteorites using specral data from the near-infrared imaging spectrometer MEx/OMEGA.

Stephen N. R. Benedix G. K. Genge M.
The Effect of Composition and Zoning on Infra-Red Spectra of the Martian Silicate Minerals **[#2199]**
We isolate mid-IR spectral characteristics of the minerals most abundant in the shergottite meteorites (pyroxene and olivine) and aim to illustrate variable compositions within their hosts are reflected in their spectra with respect to Fe, Mg, and Ca.

Irving A. J. Kuehner S. M. Chen G. Herd C. D. K. Tanaka R. Lapen T. J.
Petrologic, Elemental and Isotopic Characterization of Two Unusual Martian Meteorites: Depleted Permafic Microgabbroic Shergottite Northwest Africa 7032 and Intermediate Permafic Intersertal Shergottite Northwest Africa 7042 **[#2496]**
Two more shergottites found in Northwest Africa emphasize the growing diversity among igneous rocks from Mars.

Wilson N. V. Agee C. B. Sharp Z. D.
New Martian Shergottite NWA 6963 **[#1696]**
NWA 6963 is a newly classified martian shergottite. It has pyroxene compositional trends similar to Shergotty. Oxygen isotopes were also determined on NWA 6963 and they plot on the SNC fractionation array.

Alpert S. P. Harvey R. P. Karner J. M. Hull D. R.
Pairing in Martian Meteorites RBT 04261 and RBT 04262: Olivine's Story **[#2673]**
Pairing in two martian meteorites is explored through comparison of olivine grains. Poikilitic and cumulate textures are compared using petrographic microscope and electron microprobe data.

Righter K. Keller L. P. Rahman Z. Christoffersen R.
Exsolution of Iron-Titanium Oxides in Magnetite in Miller Range (MIL) 03346 Nakhlite: Evidence for Post Crystallization Reduction in the Nakhlite Cumulate Pile **[#2417]**
Fine ilmenite lamellae in titanomagnetite in the MIL 03346 nakhlite define a low temperature and oxygen fugacity. When combined with literature data a cooling and reduction trend is revealed.

Danielson L. Righter K. Pando K. Morris R. V. Graff T. Agresti D. Martin A. Sutton S. Newville M. Lanzirotti A.
Unusual Iron Redox Systematics of Martian Magmas **[#2419]**
Magnetite has been proposed as the dominant FeO-bearing mineral at many MER sites, and may be igneous in origin. We have conducted a series of experiments to determine magnetite stability and the ferric iron abundance in shergottite glasses.

O'Sullivan K. M. Neal C. R. Simonetti A.
A New Petrogenetic Model for the Shergotty Meteorite **[#2307]**
Using crystal stratigraphy, a new petrogenetic model is proposed for the crystallization of the Shergotty meteorite.

Aaron P. M. Shearer C. K. Jr. Burger P. V.
Ghost in the Crystal: Reconstructing the Petrogenic History of Olivine Megacrysts in Martian Basalts Using Phosphorous Zoning **[#1059]**
A reconstruction of early chemical and thermal histories in an REE enriched martian meteorite and an REE depleted martian meteorite by examining P zoning in large olivine megacrysts.

Burger P. V. Shearer C. K. Jr. Papike J. J. McCubbin F. M.
Crystal Chemistry of Merrillite in Martian Basalts and Its Significance to Interpreting Basalt Petrogenesis **[#1178]**
We examine the variation in chemistry of "merrillite-whitlockite" from a variety of martian basalts, compare them to similar phosphates in lunar basalts, and decipher the petrogenetic significance of their crystal chemistry.

Vander Kaaden K. E. McCubbin F. M. Whitson E. S. Hauri E. H. Wang J.
Partitioning of F, Cl, and H_2O Between Apatite and a Synthetic Shergottite Liquid (QUE 94201) at 1.0 GPa and 990°–1000°C **[#1247]**
Apatite/melt partitioning experiments on a QUE 94201 composition were conducted at 1 GPa and 990°–1000°C in a piston-cylinder press. The partition coefficients for F, Cl, and H_2O are highly variable and seem to correlate strongly with melt F content.

Schaub D. R. Stanley B. D. Hirschmann M. M.
Experimental Investigation of CO_2 Solubility in Primitive Martian Basalts Similar to Yamato 980459 and Implications for Martian Atmospheric Evolution **[#2265]**
Experimental studies on a synthetic material similar to martian meteorite Yamato 980459 showed lower than expected CO_2 solubility, implying that models of an early martian greenhouse that are dependent on CO_2 may need reexamination.

Nekvasil H. Ustunusik G. Lindsley D. H.
Degassing of Volatile-Bearing Martian Magma into a CO_2-Rich Atmosphere **[#2640]**
Shallow degassing into a CO_2-rich atmosphere was experimentally simulated in order to assess the contribution of magmatic volatiles to the martian atmosphere and the retention of volatiles in martian basalts upon extrusion.

Rapp J. F. Draper D. S. Mercer C. M. M.
Crystallization of Yamato 980459 at 0.5 GPa: Are Residual Liquids like QUE 94201 **[#2108]**
We have experimentally crystallized the Y-980459 composition, and find that the liquid evolves to a very similar composition to that of QUE 94201. This implies that these two meteorites sample geochemically similar source regions.

Collinet M. Médard E. Devouard B. Peslier A.
Constraints on the Parental Melts of Enriched Shergottites from Image Analysis and High Pressure Experiments **[#2269]**
Element map analysis provides accurate bulk rock compositions of LAR 06319 and NWA 1068 that allow the investigation of parental melt compositions. This method shows that olivine-melt disequilibrium cannot be explained by simple olivine accumulation.

Barnett R. G. Jones J. H. Draper D. S. Le L.
An Experimental Investigation of the Shergottite NWA 6162 **[#1523]**
Experiments on the shergottite NWA 6162 indicate that it is a partial olivine cumulate.

Balta J. B. McSween H. Y. Jr.
High Silica Contents in Martian Basalts and Its Relationship to Magmatic Water **[#1190]**
The presence of a thick crust and volatile elements such as Cl or CO_2 should produce basalts with low silica contents. We demonstrate that martian basalts appear silica enriched compared to Earth, and suggest this enrichment is due to magmatic water.

Walton-Hauck E. L.
The Occurrence of Ringwoodite in Shock Veins of the Elephant Moraine 79001 Martian Meteorite **[#1697]**
Ringwoodite in EET A79001 has been confirmed using optical microscopy and raman spectroscopy. This phase occurs as polycrystalline aggregates within and adjacent to shock veins. A shock pressure of 18–23 GPa is estimated for EET A79901 lithology A.

Huber L. Irving A. J. Maden C. Wieler R.
Noble Gas Cosmic Ray Exposure Ages of Four Unusual Martian Meteorites: Shergottites NWA 4797, NWA 5990, NWA 6342 and Nakhlite NWA 5790 **[#1408]**
We measured He, Ne, and Ar of three shergottites and one nakhlite and present their corresponding cosmic-ray-exposure ages.

Lindsay F. Turrin B. Herzog G. F. Swisher C. III Emge T.
$^{39}Ar/^{40}Ar$ Ages of Single Grains from Shergottite NWA 2626: Pushing the Limits of Laser Step-Heating **[#2836]**
Using laser step heating we measured $^{39}Ar/^{40}Ar$ ages for grains (4.5–35 μg) separated from martian meteorite NWA 2626. Plateau ages for four grains and an isochron age for all samples yield a concordant age of ~500 Ma.