Thursday, March 13, 2008
POSTER SESSION II: MARTIAN METEORITES
6:30 p.m. Fitness Center

Anand M. James S. Greenwood R. C. Johnson D. Franchi I. A. Grady M. M.
Mineralogy and Geochemistry of Shergottite RBT 04262 **[#2173]**
This abstract presents mineralogical and geochemical data on newly discovered shergottite RBT 04262 and compares it with other known shergottites.

Bunch T. E. Irving A. J. Wittke J. H. Kuehner S. M.
Highly Evolved Basaltic Shergottite Northwest Africa 2800: A Clone of Los Angeles **[#1953]**
This coarse-grained, evolved martian igneous rock may be launch paired with the Los Angeles shergottite.

Park J. Bogard D. D. Garrison D. H.
^{39}Ar-^{40}Ar Dating of Martian Shergottite, DaG 476 **[#1204]**
Mineral separated DaG 476 give apparent Ar-Ar ages much older than the reported Sm-Nd age of 474 Ma. We conclude that the origin of excess ^{40}Ar in shergottites was from the shergottite magma.

Shankar N. Swisher C. C. III Turrin B. Herzog G. F.
^{40}Ar/^{39}Ar-CO_2 Laser Incremental Heating Release Spectra for the Pasamonte Eucrite and Martian Meteorites ALH A77005, Shergotty, and Y-000749 **[#1924]**
^{40}Ar/^{39}Ar release patterns for <~10-mg samples of Pasamonte, Y-000749, and Shergotty agree well with published results. Release patterns and selected ^{40}Ar/^{39}Ar data for ALH A77005 give lower apparent ages than expected, from 0.1 to 0.5 Ga.

Puchtel I. S. Walker R. J. Brandon A. D. Irving A. J.
Highly Siderophile Element Abundances in SNC Meteorites: An Update **[#1650]**
The martian mantle sampled by shergottites contains terrestrial mantle abundances that are similar to the HSE, which also occur in chondritic relative proportions. These observations favor late accretionary models for the HSE in the martian mantle.

Elardo S. Harrington A. Nekvasil H. McCubbin F. M. Lindsley D. H.
Constraints on Water Contents of Martian Magmas: Inferences from the Chassigny Meteorite and Experiments on Backstay **[#1802]**
Experimental phase equilibrium studies of Backstay composition liquids provide first-time constraints on the water contents of martian magmas, lending insight into the nature of magmatic fluids exsolved during ascent and crystallization.

Vicenzi E. P. Davis J. Carpenter P. K. Zeigler R. A. Jolliff B. L.
Hyperspectral Imaging of Martian and Lunar Meteorites by Scanning Laboratory Source X-Ray Microfluorescence Spectrometry: A New Tool for Planetary Science **[#2335]**
Scanning laboratory source X-ray microfluorescence spectrometry is described and presented as a valuable new tool for probing meteorites between the micrometer and centimeter length scales with examples from martian and lunar meteorites.

Karner J. M. Papike J. J. Sutton S. R. Shearer C. K. Burger P. V. McKay G. A. Le L.
Valence State Partitioning of Vanadium Between Pyroxene-Melt: Effects of Pyroxene and Melt Composition and Direct Determination of V Valence by XANES **[#1110]**
V partioning into pyroxene is partially dependent on oxidation state and also availability of elements for coupled substitution.

Morris R. V. McKay G. A. Agresti D. G. Li L.
Mössbauer and Electron Microprobe Studies of Density Separates from Martian Nakhlite MIL 03346: Implications for Interpretation of Mössbauer Spectra Acquired by the Mars Exploration Rovers **[#2458]**
Density separates of martian nakhlite MIL 03346 were studied by Mössbauer spectroscopy and electron microprobe. The glass separate has abundant magnetite and products of aqueous alteration.

McCubbin F. M. Tosca N. J. Smirnov A. Nekvasil H. Fries M. Steele A.
Jarosite in a Clinopyroxene-hosted Melt Inclusion from Martian Meteorite MIL 03346: Evidence for Hydrothermal Formation by Sulfide Oxidation **[#1982]**
Jarosite was identified within a melt inclusion of martian meteorite MIL 03346. This jarosite represents the first evidence of jarosite formed by sulfide oxidation on Mars and may be the first example of hydrothermally precipitated martian jarosite.

Velbel M. A.
Aqueous Corrosion Textures of Olivine in Mars Meteorite MIL 03346 **[#1905]**
Differences in olivine corrosion between MIL 03346 and Mars meteorite falls suggest that the latter were exposed to less water over their 1.3 Ga history on Mars than the small amount MIL 03346 has been exposed to during its short Antarctic residency.

Nagao K. Park J.
Noble Gases in Bulk and Mineral Separates from the MIL 03346 Nakhlite **[#1614]**
Elementally fractionated martian atmospheric noble gases were observed in bulk and mineral separate samples from the MIL 03346 nakhlite at both low and high extraction temperatures.

Kim S.-T. Farquhar J.
Multiple Sulfur Isotope Compositions in Martian Meteorite MIL 03346 **[#2151]**
Analyses of the multiple sulfur isotope compositions in martian meteorite MIL 03346 reveal that non-mass dependent signatures are present in the sulfur-bearing mineral phases of the meteorite.

Franz H. B. Farquhar J. Kim S.-T.
Sulfur Isotopic Composition of Multiple Mineral Phases in Shergottites **[#2433]**
We are measuring sulfur isotopes in both reduced and oxidized mineral phases of several shergottites. This study reexamines ALH A77005 and EET A79001 with improved precision and provides new measurements of RBT 04261 and LAR 06319, which have not been previously analyzed.

Sutton S. R. Rao M. N. Nyquist L. E.
Sulfur and Iron Speciation in Gas-rich Impact-Melt Glasses from Basaltic Shergottites Determined by MicroXANES **[#1961]**
Sulfur and iron K XANES measurements were made on GRIM glasses from EET 79001. Iron is in the ferrous state. Sulfur speciation is predominately sulfide coordination but is Fe coordinated in Lith B and, most likely, Ca coordinated in Lith A.

Theis K. J. Lyon I. C. Burgess R. Turner G.
Iron Isotope Fractionation in Zoned Carbonates from ALH 84001 **[#1967]**
The formation temperature of the mineralogically and chemically zoned carbonates within ALH 84001 has been obtained using their iron isotope composition and confirms a low temperature origin.

Cartwright J. A. Burgess R. Crowther S. A. Gilmour J. D.
Xenon Isotope Composition of Shergottite RBT 04262 **[#2000]**
Xenon isotope systematics of mineral separates from RBT 04262 suggests a significant contribution from the terrestrial atmosphere, overprinting a martian signature similar to that of the basaltic shergottites.

Beckett J. R. McCanta M. C. Stolper E. M.
Phosphorus Zoning in SNC Olivines **[#1726]**
We use phosphorus zoning in SNC olivines to explore their early crystallization history and subsequent shock effects.

Walton E. L. Shaw C. S. J.
Dynamic Crystallization Experiments in Natural Mineral Capsules: Evaluating the Heterogeneous Nucleation Potential of Shock Melts in Martian Meteorites **[#1892]**
Synthetic glasses, having the composition of several shock melt pockets in martian basalts, have been crystallized in natural mineral capsules in order to evaluate the temperature and duration of their formation, and to constrain the kinetics of crystallization.

Jambon A. Chennaoui-Aoudjehane H. El Goresy A.
Peak Equilibrium Shock Pressure in Shergottite NWA 856 **[#2545]**
Stishovite and seifertite silica polymorphs in shock-melt pockets in NWA 856 contain different Al_2O_3 contents.

Nottke F. A. Swindle T. D.
Did Atmospheric or Planetary Local Temperatures Affect the Shock Emplacement of Noble Gases in Martian Meteorites? **[#1186]**
Are elemental fractionation effects seen in martian meteorite noble gas measurements the result of an impact injecting gases adsorped on cold rock surfaces? We discuss what possible effects low temperatures might have on noble gas insertion and some experimental tests.

Blinova A. Herd C. D. K.
Phase Relations and Experimental REE Partitioning Using a Primitive Martian Basalt Composition at High Pressure **[#1059]**
Experiments using the Yamato 980459 bulk composition doped with REE at pressures between 10 and 20 kbar provide olivine- and orthopyroxene-melt REE partitioning relevant to the conditions of formation of basaltic melts in the martian mantle.

Bowles J. A. Hammer J. E. Tatsumi L. Brachfeld S. A.
Spinel Unmixing in Martian Analog Crustal Rocks: Implications for the Magnetization of Mars **[#2264]**
Synthetic martian basalts with coarse oxide grains are annealed at sub-solidus temperatures resulting in spinel exsolution, reduction in magnetic grain size and increase in magnetization. This could lead to strong, stable magnetization of the crust.

Kurihara T. Mikouchi T. Saruwatari K. Kameda J. Arai T. Hoffmann V. H. Miyamoto M.
Transmission Electron Microscopy of "Brown" Color Olivines in Martian and Lunar Meteorites **[#2478]**
TEM observation found iron nano particles in ALH 77005, Y-000097 and NWA 2737 martian meteorites. LEW 88516 and Dhofar 489 olivines contain magnetite and hematite, respectively.

Kurihara T. Mikouchi T. Yamaguchi A. Sekine T.
Transmission Electron Microscopy of Experimentally Shocked San Carlos Olivine **[#2505]**
Experimentally shocked San Carlos olivine powders were observed by TEM. At 40 and 46 GPa, nanometer-sized magnetite particles were observed, whereas Fe-Ni metal particles were formed when graphite was mixed.

Hoffmann V. H. Funaki M. Torii M. Kurihara T. Mikouchi T.
Magnetic Signature of Lherzolitic Shergottites ALH 77005 and Yamato 000097: "Brown" Color Olivines and Detection of Fe Metal Particles by Magnetotactic Bacteria **[#1703]**
Magnetic means reveal that lherzolitic shergottites ALH 77005 and Yamato 000097 contain Fe metal as magnetic remanence carrier. MTB were applied for localizing Fe metal particles in brown olivines. This is confirmed by TEM analysis (Kurihara et al., LPSC 2008).