Thursday, August 1, 2013
MARTIAN METEORITES I
8:30 a.m. Alberta Ballroom Salon A

A session on interesting shergottites, focusing on Tissint and a newly recognized martian regolith breccia.

Chairs: **Thomas Sharp**
Justin Filiberto

8:30 a.m. Park J. * Herzog G. F. Nyquist L. E. Shih C.-Y. Turrin B. Lindsay F. N. Delaney J. S. Swisher III C. C. Agee C.
Ar-Ar and Rb-Sr ages of the Tissint Olivine-Phyric Martian Shergottite **[#5320]**
We report Ar-Ar and Rb-Sr ages of the Tissint Martian meteorite. The preliminary $^{40}Ar/^{39}Ar$ age of Tissint-1 (mainly pyroxene and maskelynite) is 610 ± 33 Ma, while that of Tissint-Oli-2 (mostly olivine macrocryst) is ~3 Ga. The best Rb-Sr age is 621 ± 17 Ma.

8:45 a.m. Ferrière L. * Brandstätter F. Topa D. Schulz T. Baziotis I. P. Münker C. Koeberl C.
The Complex History of Tissint Inferred from Different Types of Melt Inclusions and Isotopic Systems **[#5194]**
We will discuss the complex history of the Tissint meteorite, from its crystallization until its ejection as recorded by the different types of melt occurrences (primary inclusions in olivines and impact related) and using isotopic data.

9:00 a.m. Castle N. * Herd C. D. K.
Igneous Evolution of the Tissint Meteorite: Oxide compositions and Oxy-Thermobarometry **[#5338]**
Survey of Tissint oxide compositions and initial results of oxy-thermobarometry. Results are similar to other olivine-phyric shergottites and may indicate oxidization during closed system crystallization. Experiments to follow.

9:15 a.m. Sharp T. G. * Hu J. Walton E. L.
Multiple Olivine Phase Transitions in the Shocked Martian Meteorite Tissint **[#5154]**
In some melt regions of Tissint olivine dissociated into silicate perovskite + magnesiowüstite while in others it transformed into ringwoodite. These different reactions and reaction mechanisms can be explained by local temperature variations.

9:30 a.m. Walton E. L. * Hu J. Sharp T. G.
Heterogeneous Distribution of High-Pressure Phases in the Tissint Martian Meteorite: No need for Multiple Impact Events **[#5152]**
The location and distribution of high-pressure phases in Tissint have been mapped using BSE images combined with Raman Spectroscopy and found to be a function of the thermal history of the meteorite.

9:45 a.m. Darling J. R. * Moser D. E. Barker I. Tait K. T. Chamberlain K. Schmitt A. K.
The Shocking State of Baddeleyite in Basaltic Shergottite Northwest Africa 5298 **[#5316]**
The effects of shock metamorphism on the U-Pb systematics of baddeleyite (ZrO2) in basaltic shergottite Northwest Africa 5298 have been investigated by combining electron beam microstructural techniques (CL, EBSD) with in-situ U-Pb SIMS analyses.

10:00 a.m. Filiberto J. * Goodrich C. A. Schwenzer S. P. Tindle A. G. Grady M. M.
Constraints on the Origin of the Olivine-Megacrysts and the Parental Magma of NWA 1068 from Melt Inclusions **[#5030]**
We have analyzed melt inclusions in olivine ranging from Fo_{72} to Fo_{55} to constrain the origin of the megacrystic olivine and the parental magma composition of NWA 1068.

10:15 a.m. Santos A. R. * Agee C. B. McCubbin F. M. Shearer C. K. Burger P. V.
Martian Breccia NWA 7034: Basalt, Mugearite, and Trachyandesite Clasts **[#5284]**
Basalt clasts in martian meteorite NWA 7034 are compositionally similar to rocks analyzed by Spirit Rover in Gusev Crater, and together with the mugearite and trachyandesite clasts show a similar trend to data from Curiosity Rover in Gale Crater.

10:30 a.m. Wittmann A. * Korotev R. L. Jolliff B. L. Kuehner S. M. Irving A. J.
Petrology of Impact Melt Rich Martian Regolith Breccia Northwest Africa 7475 **[#5272]**
The petrography of "basaltic breccia" NWA 7475 indicates a suevite-like regolith breccia. Spherules, crystallized and vitric impact melts, siltstone, accretionary lapilli, and diverse basaltic and plutonic rock and mineral clasts constitute martian soil.

10:45 a.m. Hewins R. H. * Zanda B. Humayun M. Lorand J.-P. Deldicque D. Pont S. Fieni C. Nemchin A. Grange M. Kennedy A. Göpel C. Lewin E.
Petrology of NWA 7533: Formation by Impacts on Ancient Martian Crust **[#5252]**
NWA 7533 contains FeNi grains (~μm), up to 4.5% Ni in pyrite, and 500 nm Os-Ir-rich particles. Lithic clasts are pyroxenite, norite and zircon-bearing monzonite. The impact melt can be modeled as a mixture of crystal clasts and is poor in monzonite.

11:00 a.m. Humayun M. * Nemchin A. Grange M. Kennedy A. Zanda B. Hewins R. H. Lorand J.-P. Göpel C. Lewin E. Pont S. Deldicque D.
The Age and Composition of the Martian Crust from NWA 7533 **[#5198]**
NWA 7533 is a pre-Noachian regolith breccia, containing siderophiles consistent with 5% chondritic impactor, 4.44 Ga zircons, and LILE enrichments implying a crustal thickness of 50 km established in the first 100 Ma of martian history.

11:15 a.m. Nyquist L. E. * Shih C.-Y. Peng Z. X. Agee C.
NWA 7034 Martian Breccia: Disturbed Rb-Sr Systematics, Preliminary ~4.4 Ga Sm-Nd Age **[#5318]**
We report a preliminary Sm-Nd age of 4.39 ± 0.08 Ga for NWA 7034 confirming its antiquity. The Rb-Sr isotopic system is disturbed, but suggests an ancient 2.7 ± 0.6 Ga age followed by a late disturbance.

11:30 a.m. Moser D. E. * Shaulis B. Lapen T. Reinhard D. A. Olson D. Clifton P. H. Larson D. J. Barker I. Irving A. J.
Zircons from Amazonian Mars: Microstructure, Age, and Atom Probe Tomography of a Regolith Population **[#5237]**
We present the first age and microstructure information from our discovery of regolith zircons and accessory minerals in a relatively water-rich sample of Mars.

11:45 a.m. Charlier B. L. A. * Verchovsky A. Agee C. B. Grady M. M.
Re-Visiting the Evolutionary History of Mars: The Perspective from NWA 7034 **[#5344]**
We are undertaking a combined radiogenic and light element isotope study of primary and secondary components in martian meteorites, taking NWA 7034 as a starting point for comparison with nakhlites and ALH 84001.