

**Thursday, March 22, 2012**  
**PLANETARY BRINES AND ALTERATION**  
**1:30 p.m. Waterway Ballroom 6**

**Chairs:** Jeffrey Kargel  
 Susanne Schwenzer

- 1:30 p.m. Sapers H. M. \* Osinski G. R. Buitenhuis E. Banerjee N. R. Flemming R. L. Hainge J. Blain S.  
[\*The Ries Post-Impact Hydrothermal System: Spatial and Temporal Mineralogical Variation\*](#) [#1915]  
 Mineralogical data from surficial suevite, Nördlingen, and Wörnitzostheim drill cores used to assess the extent of the Ries post-impact hydrothermal system suggest that the system outside the crater rim is more extensive than previously reported.
- 1:45 p.m. Dypvik H. \* Hellevang H. Kalleson E.  
[\*Alteration of Impact Melts\*](#) [#1072]  
 In this project we study the alteration processes of melt rocks, impact melt in particular. Experimental analyses, succeeded by mineralogical and geochemical modeling, explain the formation of alterations products, e.g., smectites, saponite, zeolites.
- 2:00 p.m. McCollom T. \* Moskowitz B. Berquo T. Hynek B.  
[\*Acid-Sulfate Alteration of Basalt in Fumarolic Environments on Earth and Mars\*](#) [#1574]  
 A combined field, experimental, and model study of acid-sulfate alteration indicates that the initial stage of alteration of martian basalt in fumarole environments should be dominated by amorphous silica, gypsum, Fe-rich natroalunite, and kieserite.
- 2:15 p.m. Bridges J. C. \* Schwenzer S. P.  
[\*The Nakhlite Hydrothermal Brine\*](#) [#2328]  
 The nakhlite martian hydrothermal brine reached 100°C, pH 8–9.5, and a low water rock ratio <10. These constraints were determined with a thermochemical model (using CHILLER) based on the known nakhlite hydrothermal assemblage.
- 2:30 p.m. Mangold N. \* Carter J. Poulet F. Dehouck E. Ansan V. Loizeau D.  
[\*Hydrothermal Alteration in a Late Hesperian Impact Crater on Mars\*](#) [#1209]  
 The 45-km-diameter Majuro Crater shows an alluvial fan containing phyllosilicates. Observations suggest alteration occurred during the Hesperian by hydrothermal circulation due to the impact heat coupled to snow precipitation.
- 2:45 p.m. Noe Dobrea E. Z. \* Swayze G. A.  
[\*Hydrothermal Alteration Products in the Circum-Hellas Region: Targets for Future Landing Missions\*](#) [#1009]  
 This work presents an analysis of the regional geological and mineralogical context for prehnite detected in the NW Hellas rim, in support of Mars Exploration's Critical Data Produces program.
- 3:00 p.m. Schmidt M. E. \* Flemming R. L. Stickles J. Morena J.  
[\*Hydraulic Properties Control Phyllosilicate and Zeolite Formation in Basaltic Tuffs: Implications for Detection and Alteration Processes on Mars\*](#) [#1226]  
 Basaltic hydrovolcanic tuffs from central Oregon illustrate how primary porosity and permeability control hydrothermal fluid flow and alteration assemblages.
- 3:15 p.m. Hausrath E. M. \* Adcock C. T. Tu V.  
[\*Phosphate Records Environmental Conditions Important to Habitability in Soils and Rocks on Mars\*](#) [#2719]  
 Phosphate, an important terrestrial nutrient, behaves differently under different conditions of pH, water: rock ratio, time and oxidation state, and may preserve characteristics important to habitability in soils and rocks on Mars.

- 3:30 p.m. Gough R. V. \* Chevrier V. F. Tolbert M. A.  
[\*Deliquescence of Perchlorate/Chloride Mixtures: Implications for Stable and Metastable Aqueous Solutions on Mars\*](#) [#1706]  
Raman microscopy is used to study the deliquescence (solid to aqueous transition) and efflorescence (aqueous to solid transition) of three  $\text{ClO}_4^-/\text{Cl}^-$  mixed salt systems. We find that aqueous phases form at low RH values and may occur on current Mars.
- 3:45 p.m. Barge L. M. \* Doloboff I. J. Kanik I. Russell M. J.  
[\*Electrochemistry of Inorganic Membranes at Alkaline Hydrothermal Vents — Energy Sources for Emerging Life on Wet Rocky Planets\*](#) [#2489]  
We present electrochemical studies of iron sulfide membranes precipitated in simulated alkaline hydrothermal systems. The electrochemical/chemiosmotic energy in such membranes may be sufficient to drive the emergence of metabolism on rocky planets.
- 4:00 p.m. Doloboff I. J. \* Barge L. M. Russell M. J. Kanik I.  
[\*Characterization of Electrochemical and Morphological Properties of Iron-Phosphate-Silicate Chemical Garden Structures\*](#) [#2646]  
Examination of the growth of  $\text{Fe}^{2+}$ , phosphate, and silicate chemical garden structures to understand properties of similar structures that may have formed at Hadean alkaline hydrothermal vents which may play an important role in the emergence of life.
- 4:15 p.m. Schwenzer S. P. \* Anand M. Franchi I. A. Gibson J. M. Greenwood R. C. Hammond S. Haubold R. Herrmann S. Kelley S. P. Ott U. Tindle A. G.  
[\*Cold Desert Alteration of Martian Meteorites: Mixed News from Noble Gases, Trace Elements and Oxygen Isotopes\*](#) [#1954]  
We investigated rim and interior subsamples from the martian meteorites ALH A77005 and RBT 04261 and found terrestrial alteration to influence mineralogy and heavy noble gases but less so oxygen isotopes and trace elements.
- 4:30 p.m. Wang A. \*  
[\*Subsurface Hydrous Salts and Obliquity Cycle on Mars\*](#) [#2172]  
We correlate the dehydration and rehydration rates of Mg-sulfates (derived from experimental data) with Mars obliquity cycles and evaluate the preservation potential of highly hydrated sulfates in the subsurface of equatorial regions on Mars.