

Tuesday, March 21, 2017

[T202]

**CONSTRAINING MARTIAN CLIMATE AND  
ENVIRONMENTAL HISTORY FROM MINERALOGY**

**8:30 a.m. Waterway Ballroom 4**

**Chairs: Janice Bishop  
James Wray**

- 8:30 a.m. Usui T. \* Kurokawa H. Wang J. Alexander C. M. O'D. Simon J. I. et al.  
[\*Hydrogen Isotopic Constraints on the Evolution of Surface and Subsurface Water on Mars\*](#) [#1278]  
We constrain the atmospheric loss and possible exchange of surface and subsurface water since 4 Ga based on our new D/H data of Noachian carbonates.
- 8:45 a.m. Bishop J. L. \* Baker L. L. Fairén A. G. Gross C. Velbel M. A. et al.  
[\*Unraveling the Diversity of Early Aqueous Environments and Climate on Mars Through the Phyllosilicate Record\*](#) [#1804]  
We postulate that sporadic, short-term warm and wet environments enabled formation of the observed surface clays during a generally cold and wet early Mars.
- 9:00 a.m. Cannon K. M. \* Parman S. W. Mustard J. F.  
[\*Primordial Clays on Mars Formed Beneath a Steam or Supercritical Atmosphere\*](#) [#2400]  
We show modeling results for the evolution of a clay-rich layer in Mars' primary crust, formed by interaction with a steam or supercritical atmosphere.
- 9:15 a.m. Seelos K. D. \* Maxwell R. E. Seelos F. P. Buczkowski D. L. Viviano-Beck C. E.  
[\*Exploring Emplacement Mechanisms for Phyllosilicate Outcrops in West Margaritifer Terra, Mars\*](#) [#2846]  
Old clays are formed there / But how so? We ascertain / Water holds the key.
- 9:30 a.m. Peretyazhko T. S. \* Niles P. B. Sutter B. Clark J. V. Morris R. V. et al.  
[\*Smectite Formation in Acid Sulfate Environments on Mars\*](#) [#1521]  
Acidic smectite formation on Mars.
- 9:45 a.m. Kaufman S. V. \* Mustard J. F. Head J. W.  
[\*Evaluation of Volcano Ice Interactions as a Potential Geologic Process for the Formation of Phyllosilicates on Mars\*](#) [#2510]  
Investigates the potential of extrusive volcanism as a source of water for the leaching of parent material to form phyllosilicates on a cold and icy Mars.
- 10:00 a.m. Thorpe M. T. \* Hurowitz J. H. Dehouck E.  
[\*A Frigid Terrestrial Analog for the Paleoclimate of Mars\*](#) [#2599]  
The geochemistry and mineralogy of basaltic sediment generated in the glacial environment of Iceland displays limited evidence for chemical weathering.
- 10:15 a.m. Scudder N. A. \* Horgan B. Rutledge A. M. Rampe E. B.  
[\*Using Composition to Trace Glacial, Fluvial, and Aeolian Sediment Transport in a Mars-Analog Glaciated Volcanic System\*](#) [#2625]  
Ice on mafic rock / While clays and oxides pass by / Silica is born.
- 10:30 a.m. Sun V. Z. \* Milliken R. E. Robertson K. M.  
[\*Opals on Mars: Geologic Settings and Orbital Evidence for Seasonal Cycling of Water with the Atmosphere\*](#) [#1715]  
Spectral variations in martian opals are linked to opal maturity in geologic settings as well as hydration changes from seasonal opal-atmosphere water exchange.

- 10:45 a.m. Milliken R. E. \* Hurowitz J. A. Grotzinger J. P. Wiens R. C. Gellert R. et al.  
[\*Of Elements, Minerals, and Rocks: Mt. Sharp as a Key Reference Section in Assessing the Climatic Evolution of Mars\*](#) [#2189]  
Synthesis of Curiosity data shows that Gale Crater mudstones record evolution in oxidation state and degree of water-rock-atmosphere interaction on early Mars.
- 11:00 a.m. Shidare M. \* Nakada R. Usui T. Shimizu K. Yokoyama T. et al.  
[\*Detection of Martian Sulfate from Impact Glasses in Shergottites by X-Ray Absorption Near-Edge Structure Analysis\*](#) [#1973]  
XANES analyses combined with superimposed XRF images observed martian S(VI) features, suggesting the meteoritic evidence for acidic aqueous alteration on Mars.
- 11:15 a.m. Leask E. K. \* Ehlmann B. L. Wray J. J. Anderson R.  
[\*Martian Lake Plumbing: Mineralogy, Morphology, and Geologic Context of Hydrated Minerals in Terra Sirenum\*](#) [#2609]  
We investigate the nature of secondary mineral formation in the Terra Sirenum region of Mars, looking at phyllosilicates, sulphates, chlorides, etc. in context.
- 11:30 a.m. Stern J. C. \* Sutter B. Jackson W. A. Navarro-Gonzalez R. McKay C. P. et al.  
[\*Nitrogen on Mars: Insights from Curiosity\*](#) [#2726]  
The relationship between nitrate and perchlorate may help reveal the timing of nitrogen fixation and post-depositional behavior of nitrate on Mars.
- 11:45 a.m. Mustard J. F. \* Tarnas J. D.  
[\*Hydrogen Production from the Upper 15 km of Martian Crust via Serpentinization: Implications for Habitability\*](#) [#2384]  
Hydrogen produced via serpentinization is computed by altering the upper 15 km of the martian crust provides abundant H<sub>2</sub> for a subsurface microbial ecosystem.