Tuesday, May 17, 2016
POSTER SESSION: SIGNATURES OF PAST LIFE AS WE KNOW IT
5:30 p.m. Regency C

Kolb V. M. ***POSTER LOCATION #33***
On the Use of Biomarkers of Poly(Extremophiles) in the Search for Life on Mars **[#2009]**
We present a compilation of selected chemical structures of biochemical compounds that are involved in metabolism of (poly)extremophiles, and their infrared frequencies. The latter could be useful for identification of related compounds on Mars.

Pavlov A. A. Glavin D. McLain H. Dworkin J. ***POSTER LOCATION #34***
Elsila-Cook J. Eigenbrode J.
Preservation of Organic Molecules Under Cosmic Rays in Martian Surface Rocks **[#2066]**
Organic molecules are destroyed in the surface rocks of Mars by cosmic rays at faster rates than was assumed in previous studies. Only surface rocks, with an exposure age of less than 50 million years, might contain unaltered amino acids.

Quinn R. C. ***POSTER LOCATION #35***
Radiolytic Alteration of Biosignatures on Mars **[#2073]**
When exposed to ionizing radiation, a complex distribution of redox states and reactive intermediates form in both perchlorate and nitrate salts. These reactive species then act to alter the forms of organic biosignatures preserved on Mars.

Lorber K. N. Czaja A. D. Lee P. ***POSTER LOCATION #36***
Variations in Biosignature Preservation: Geochemical Analysis of Kerogen Comparing Two Mars Analog Environments **[#2078]**
This work investigates kerogen from early Earth and impact crater environments, both of which can be viewed as an analog for those on Mars. The biosignatures presented here are geochemically preserved as microfossils or as amorphous kerogen.

Freissinet C. Glavin D. P. Buch A. Szopa C. Archer P. D. Jr ***POSTER LOCATION #37***
Brinckerhoff W. B. Brunner A. E. Eigenbrode J. L. Franz H. B.
Kashyap S. Malespin C. A. Millan M. Miller K. E. Navarro-Gonzalez R.
Prats B. D. Summons R. E. Teinturier S. Mahaffy P. R.
Preservation of Organic Molecules at Mars' Near-Surface **[#2049]**
Detection of organics at Mars' surface is challenged by its degradation. Curiosity rover was able to detect some organics in a martian mudstone, providing a context for a habitable environment and raising the possibility for detecting biosignatures.

Noe Dobrea E. Z. McAdam A. C. Freissinet C. Franz H. Belmahdi I. ***POSTER LOCATION #38***
Hamersley M. R. Stoker C. R. Parker W. G. Glavin D. P.
Calef F. Aubrey A. D.
Preservation of Organics at the Painted Desert: Lessons for MSL and Beyond **[#2031]**
We explore the preservation of organic molecules in a variety of lithologies represented at the Painted Desert to better understand the mechanisms for the preservation of organics in ancient fluivo-lacustrine and deltaic sediments.

Kamakolanu U. G. Freund F. T. ***POSTER LOCATION #39***
Matrix Embedded Organic Synthesis **[#2082]**
In the matrix of minerals such as olivine, a redox reaction of the low-z elements occurs. Oxygen is oxidized to the peroxy state while the low-Z-elements become chemically reduced. We assign them a formula $[C_xH_yO_zN_iS_j]^{n-}$ and call them proto-organics.

Szynkiewicz A. Mikucki J. ***POSTER LOCATION #40***
Sulfur Biosignatures in Continental Hot Spring, Stream and Crater Lake Sediments Affected by Hydrothermal H_2S Gas Emission **[#2034]**
In this study, we focused on identifying two types of biosignatures in a continental volcanic complex of Valles Caldera, New Mexico: 1) metabolic sulfur isotope biosignatures; 2) molecular (genomic) signatures.

Conrad P. G. Arevalo R. D. Fa K. A. Rice M. S. Gupta S. ***POSTER LOCATION #41***
Brinckerhoff W. B. Getty S. A.
Interrogation of Temporal Planetary Analogs for Biosignature Detection **[#2071]**
We present an approach and an instrument for identifying promising temporal horizons for preservation of organic materials in the martian rock record. Time After Time uses radiometric and exposure age dates to optimize candidate sample location.

Mickol R. L. Craig P. I. Kral T. A. ***POSTER LOCATION #42***
Nontronite and Montmorillonite as Nutrient Sources for Life on Mars **[#2035]**
Methanogens were grown in media containing bicarbonate buffer, nontronite or montmorillonite clay, and hydrogen gas. No other nutrients were added. These results suggest that martian clays may provide adequate nutrients to support organism growth.

Archer R. Ralat A. ***POSTER LOCATION #43***
Biosignature Preservation Vulnerability Associated with Stress Response Metabolic Redox Mode Switching in a Mars Analogue Coupled Microbial Mat Transiting Near-Space **[#2036]**
Examination of a coupled microbial mat recovered from Death Valley failed to detect rosickyte, both before and after exposure to near-space conditions; associated redox proxies suggest diagenesis caused by rapid adaptive microbial stress response.

Plescia J. B. Johnson J. R. ***POSTER LOCATION #44***
Visible Near-Infrared Reflectance Spectra of Hydrothermal Silica Sinter Deposits and Extremophiles **[#2045]**
VNIR spectra of silica sinter show absorptions due to OH, H_2O and various alteration products. Spectra of extremophile organisms demonstrate that species can be differentiated.

Sklute E. C. Kashyap S. Holden J. F. Dyar M. D. ***POSTER LOCATION #45***
Spectral Evolution of Bioreduced Ferrihydrite by Hyperthermophiles **[#2048]**
The hyperthermophile Pyrodictium sp. Su06 reduces ferrihydrite to a black, magnetic, Fe(II)-bearing mineral. Mossbauer spectra for that mineral freeze dried vs. frozen in the original liquid suspension differ. Both represent potential biosignatures.

Perl S. M. Vaishampayan P. A. Corsetti F. A. Piazza O. Ahmed M. ***POSTER LOCATION #46***
Willis P. Creamer J. S. Williford K. W. Flannery D. T. Tuite M. L.
Ehlmann B. L. Bhartia R. Baxter B. K. Butler J. Hodyss R.
Berelson W. M. Nealson K. H.
Identification and Validation of Biogenic Preservation: Defining Constraints Within Martian Mineralogy **[#2026]**
This investigation seeks to confine the limits of preservation potential within evaporate minerals by performing analyses to determine the extent of biological retention, in-situ validation of biogenic matter, and volumetric examination of clays.

Munoz-Saez C. Gutierrez J. I. Manga M. ***POSTER LOCATION #47***
Textural Bio-Signatures of Geyserites Imaged by ?XRT **[#2025]**
Discharge of water from hot springs form sinter deposits, inhabited by micro-organisms. By analyzing textures of sinter rocks from El Tatio (Atacama), using XRT, we found bio-signatures and related to environmental conditions of deposition.

Gnanaprakasa T. J. Domanik K. DiRuggiero J. Zega T. J. ***POSTER LOCATION #48***
Sensing Biosignatures Within Rocks of the Atacama Desert — An Analog for Mars Environments **[#2079]**
We have been investigating potential biosignatures and mineral microstructure alteration of rocks from the Atacama desert in Chile. These materials represent martian analogs and are known to contain colonizing bacteria, to establish biosignatures.

Bonaccorsi R. Fairen A. G. Baker L. McKay C. P. Willson D. ***POSTER LOCATION #49***
Pizza or Pancake? Formation Models of Gas Escape Biosignatures in Terrestrial and Martian Sediments **[#2084]**
Fine-grained sedimentary hollowed structures were imaged in Gale Crater, but no biomarkers identified to support biology. Our observation-based (gas escape) terrestrial model could inform on possible martian paleoenvironments at time of formation.

Zaloumis J. Farmer J. D. ***POSTER LOCATION #50***
Diagenetic Changes in Microstromatolites from a Modern Cool-Water Travertine Spring **[#2055]**
Microstromatolites from Crystal Geyser travertine deposits show rapid diagenetic degradation. Morphological textures quickly degrade with burial, though organic signatures are still preserved as kerogen and may be detected with Raman spectroscopy.

Hickman-Lewis K. Garwood R. J. Brasier M. D. Goral T. ***POSTER LOCATION #51***
Jiang H. McLoughlin N. Wacey D.
Carbonaceous Microstructures of the 3.46 Ga Stratiform 'Apex Chert', Pilbra, Western Australia: Presenting a New Suite of Early Archaean Microbially Induced Sedimentary Structures **[#2029]**
We present morphological and geochemical evidence for a new suite of MISS from the stratiform Apex chert. Four potential biosignatures are identified in this marine unit: laminated clasts, roll-ups, flaky grains and persistent filamentous laminae.