Thursday, March 10, 2011
POSTER SESSION II: EXOBIOLOGY
6:00 p.m. Town Center Exhibit Area

Oehler D. Z. Allen C. C.
The Search for Biosignatures on Mars: Using Predictive Geology to Optimize Exploration Targets **[#1178]**
Facies prediction on Mars can optimize the search for organic biosignatures by identifying localities in which organic-rich shales are likely, as such shales typically concentrate and preserve organics that are present in the environment.

Barge L. M. Russell M. J. Kanik I.
Precipitation Patterns of Iron Minerals in a Chemical Gradient: A Laboratory Analog to Hydrothermal Environments on the Early Earth **[#1099]**
We investigated iron mineral precipitation along redox/pH gradients in silica gels, to study mineralization in a chemical gradient. This work is applicable to a putative origin of life in alkaline low-temperature hydrothermal environments.

Foing B. H. Thiel C. Direito S. Ehrenfreund P. Roling W. Martins Z. Sephton M. Stoker C. Zhavaleta J. Orzechowska G. Kidd R. Quinn R. Kotler M. EuroGeoMars MDRS Team
Astrobiology and Habitability Studies Supporting Mars Research and Missions **[#1762]**
During EuroGeoMars 2009 campaign, we characterized the mineralogy, organic compounds and microbiology of selected samples from different geological sites, and established correlations (Special Issue: "Astrobiology field research in Moon/Mars analog environments": IJA 2011).

Schuerger A. C. Britt D.
Hypobaric Conditions Within Rock Void Spaces on Mars will Likely Inhibit the Replication of Terrestrial Microorganisms **[#1976]**
Internal void spaces within rocks outgas rapidly under simulated martian conditions. Water activity and pressure within rock void spaces are not sufficient to permit the replication of terrestrial microorganisms from spacecraft on Mars.

Dartnell L. R. Storrie-Lombardi M. C. Muller J.-P. Griffiths A. D. Coates A. J. Ward J. M.
Implications of Cosmic Radiation on the Martian Surface for Microbial Survival and Detection of Fluorescent Biosignatures **[#1977]**
We report experimental results on the survival of microbial life exposed to cosmic rays on Mars, building on our computer modeling of this ionizing radiation. On-going work is on the irradiation degradation of detectable fluorescent biosignatures.

Pavlov A. A. Caffrey M. Getty S. Johnson C. S.
Formation of Liquid Water in the Shallow Subsurface Under Simulated Martian Conditions **[#2480]**
We discovered formation of liquid water films in the simulated martian shallow subsurface environment. Liquid/mobile water is present even though in some runs the atmospheric pressures were kept below the triple point of water.

Ponce A. Beaty S. M. Lee C Noell A. C. Stam C. N. Connon S. A.
Microbial Habitat on Kilimanjaro's Glaciers **[#2645]**
Kilimanjaro glaciers captured a history of microbial diversity and abundance of supraglacial habitats. We show that a majority of bacterial clones, as determined by bacterial 16S rRNA gene sequencing, are most closely related to those isolated from cold-water environments.

Yakovlev V. V.
The Hydrolaccoliths of Holden Crater — The Possible Storage of Life Traces **[#1115]**
The possibility of life trace search on a surface of the degrading hydroloccaliths which were formed by an injection of underfrost waters is considered.

Lee Y. K. Kim O.-S. Kim H. Hong S. G. Chun J. Lee B. Y.
Microbial Diversity of Active Layer Soil from the Canadian High Arctic **[#1357]**
We present bacterial and archaeal diversity in active layer soil from the Canadian high Arctic using a high-resolution pyrosequencing analysis. The predominant bacterial group is related to Proteobacteria (37.7%) and Bacteroidetes (30.0%) .

Marnocha C. L. Chevrier V. F. Ivey D. M.
Growth of Sulfate-Reducing Bacteria in Sulfate Brines and the Astrobiological Implications for Mars **[#1604]**
We suggest sulfate-reducing bacteria as a model for life on Mars, as sulfate brines have been shown to be stable in martian conditions. We have performed experiments to determine the survivability of these bacteria in high sulfate concentrations.

Kodama T. K. Genda H. G. Abe Y. A. Zahnle K. Z.
Evolution from Ocean Planet to Land Planet by Water Loss; The Inner Edge of Habitable Zone **[#2132]**
We discuss the inner edge of Habitable Zone and imaginary planetary evolution from ocean planet to land planet by focus on water loss. When such evolution occur, planets keep habitable. We demonstrate the possibility of the various type of habitable planets.

Williams A. J. Sumner D. Y.
Geobiology of Acid Saline Systems: Implications for the Development and Preservation of Mineralogic Biosignatures on Mars **[#2125]**
This study investigates 1) the role of biology in acid-saline mineral weathering and 2) biosignature preservation to document biosignatures present in terrestrial gossans that can aid in interpreting features observed by Mars Science Laboratory.

Burchell M. J. Solscheid S. Price M. C. Josse L. Adamek N. Cole M. J.
Survival of Yeast Spores in Hypervelocity Impacts Events up to Velocities of 7.4 km sec-1 **[#1759]**
Survival of yeast spores in hypervelocity impacts is reported in experiments at speeds up to 7.4 km/s (corresponding to peak shock pressures of around 30 GPa).

Miura Y. Tanosaki T.
Formation of Nano-Bacteria-Like Flow Textures Formed at Oxygen-Rich Air Condition of Shock Wave Reacton **[#1692]**
Nano-flow textures with irregular shapes are obtained by shock impact on carbon-fibers with oxygen-rich air condition (not at vacuum condition), which are different with nano-bacteria texture of the martian meteorite with regular nano-flow textures.

Bebout G. E. Anderson L. D. Izawa M. R. M. Banerjee N. R. Bridge N. J. Flemming R. L.
Nitrogen Concentrations and Isotopic Compositions of Altered Terrestrial Glassy Basaltic Rocks, and Implications for Astrobiology **[#2500]**
We report N contents and isotopic compositions of modern and ancient subaqueous basaltic rocks, discuss the biotic and abiotic processes generating these N signatures, and speculate on the implications for preservation in extraterrestrial materials.

Socki R. A. Fu Q. Niles P. B. Gibson E. K. Jr.
Carbon Isotope Measurements of Experimentally-Derived Hydrothermal Mineral-Catalyzed Organic Products by Pyrolysis-Isotope Ratio Mass Spectrometry **[#2311]**
We report a new pyrolysis technique to extract and measure C isotopes of low-molecular weight mixtures of solid-phase hydrocarbons and intermediary products produced during high-temperature and high-pressure synthesis on mineral-catalyzed surfaces.

White L. M. Mielke R. E. Russell M. J. Stucky G. D. Kanik I.
Investigating the Role of Iron Sulfides in the Hydrothermal Vent Model for the Emergence of Life **[#1087]**
We describe the results of fabrication and analysis of iron sulfide precipitated chimney-like structures under anoxic hydrothermal conditions as a step toward understanding the structure and surface chemistry bringing about the emergence of life on any wet, rocky planet.

Ehrenfreund P. Ricco A. J. Quinn R. Bramall N. Bryson K. Chittenden J. Cook A. Mancinelli R. Mattioda A. Minelli G. Nicholson W. Santos O. Squire D. Kitts C. Rasay R. Young A.
The O/OREOS Mission — Astrobiology Data Collected in Low Earth Orbit **[#1918]**
The O/OREOS nanosatellite is the first demonstration flight mission of the NASA Astrobiology Small-Payloads Program (ASP). Sucessfully launched on Nov. 19, 2010 to a 650-km Earth orbit, the spacecraft operates nominal and records first science data.

Westall F. Pullan D. Bost N. Ramboz C. Foucher F. Mars-Analogue Rock Collection Team
Mars Exobiology Mission 2018 (MAX-C/ExoMars) and the Mars Analogue Rock Collection at the OSUC, Orléans **[#1346]**
The Orléans-OSUC analogue rock collection and database contains well characterised igneous, sedimentary, and hydrothermal rocks and minerals for use in instrument testing and *in situ* missions and specifically the 2018 Max-C/ExoMars mission.

Cousins C. R. Griffiths A. D. Crawford I. A. Prosser B. J. Coates A. J.
Selection of the Geological Filters on the ExoMars PanCam Instrument **[#1826]**
ExoMars has the key objective of looking for evidence of life on Mars. The rover will be equipped with a panoramic camera which will image the martian geological terrain via 12 narrowband 'geology' filters, the wavelengths of which are presented here.

Tsou P. Brownlee D. E. McKay C. P. Spilker L. Beegle L. W. Kanik I.
LIFE: Enceladus Sample Return Mission Concept for Searching Evidence of Life **[#2478]**
LIFE is an extremely rare mission opportunity: it offers comparable Flagship level science but at a low flyby sample return cost via a Discovery or New Frontiers mission.