

Tuesday, March 11, 2008
POSTER SESSION I: ASTROBIOLOGY
6:30 p.m. Fitness Center

Ipatov S. I. Cho Y.-K.

Synthetic Spectra from a GCM Simulation of a Model Exo-Earth [#2554]

Several Earth-like planets outside the solar system have recently been detected. An estimated 35% of stars harbor Earth-like planets. Hence, many more are expected to be detected in the near future.

Elwood Madden M. E. Ulrich S. M. Phelps T. J.

Slow Hydrate Dissociation Mechanisms: Examining the Negative Feedback Effects [#1088]

The kinetics of hydrate dissociation is limited by several negative feedback effects. Therefore, rapid dissociation of gas hydrate near equilibrium conditions is unlikely. This may provide a mechanism for slow release of gases over long time periods.

Socki R. A. Niles P. B. Gibson E. K. Romanek C. S. Zhang C. L. Bissada K. K.

Detection of Abiotic Methane in Terrestrial Continental Hydrothermal Systems: Implications for Methane on Mars [#1860]

Isotopic measurements of CO₂ and CH₄ in two continental hydrothermal systems suggest that abiotic CO₂ reduction is occurring at temperatures as low as 155°C. This supports arguments for an abiotic origin of martian atmospheric methane.

Prieto-Ballesteros O. Gómez F. Rodríguez J. A. Garcia Baonza V. Segura A. MALTA Team

The Habitability of the Icy Subsurface and the Potential Aqueous Ocean of Europa. Experiments at High Pressure [#2026]

A set of experiments using different simulation chambers have been planned in order to study a) the survival of microorganisms in conditions of the Europa interior and b) the preservation of some biosignatures to the surface conditions.

Spencer L. M. McKay D. S. Thomas-Keprta K. L. Wentworth S. J. Clemett S. J.

Observation and Analysis of Martian Meteorite Y-000593: Evidence for Biosignatures [#1680]

The martian meteorite Yamato 000593 contains possible evidence of biogenic activity as noted by the similarity of biogenic features reported by Fisk et al. (2006). A combination of micro-analytical techniques were used to support these observations.

Fairen A. G. Davila A. F. Duport L. G. Stoker C. Amils R. Bonaccorsi R. Zavaleta J. Lim D. S. Schulze-Makuch D. McKay C. P.

Subsurface Formation of Oxidants on Mars and Implications for the Preservation of Organic Biosignatures [#2061]

A geochemical model for the aqueous formation of oxidants and sulfate-rich groundwater in the subsurface of Mars indicates that large portions of the upper crust may be depleted in organics as molecular biomarkers are oxidized by groundwater-rock interactions.

Bertrand M. Westall F. van der Gaast S. Vilas F. Hörz F. Haynes J. Chabin A. Brack A.

Amino Acid Degradation after Meteoritic Impact Simulation [#1749]

Experimental impacts of simulated amino acid/artificial meteorite mixes at between 153–289 Kbar demonstrated the survival of the organic molecules but a distinct change in certain of the enantiomers due to enantiomeric selective destruction.

Browning E. A. Lindsay J. F. Socki R. A.

A Stable Isotope History of Cambrian Carbonates from the Georgina Basin, Northern Australia [#1483]

By analyzing the stable isotopes of carbon and oxygen, we were able to produce a record of major tectonic events occurring during the Cambrian period. We have identified two such events, the Late Templetonian-Floran event and the Ordian-Early Templetonian event.

Kuyama T. Ninagawa K. Gucsik A. Bérczi Sz. Kereszturi Á. Hargitai H. Nagy Sz.
Combined Micro-Raman and Cathodoluminescence Approach to Identify Biosignature in Carbonates [#1240]
We measured CL spectra of biologic and geologic calcium carbonates at room and liquid nitrogen temperature, and Raman spectra. There is possibility that a difference in temperature dependence would distinguish the biological calcite from the geological one.

Davila A. F. Gómez-Silva B. de los Rios A. Ascaso C. McKay C. Wierzchos J.
Halite Crusts as Targets for the Search for Life on Mars [#1083]
The finding of endolithic bacteria that have colonized the interior of halite rocks in hyper-arid deserts on Earth suggests that similar deposits on Mars may represent important targets for future life detection missions.

Schieber J. Zawar Y. Glamoclija M.
Experiments on Silicification of Iron Microbes — A Preliminary Report [#2132]
Silicification experiments on *Leptothrix* show that within three months there is significant uptake of silica within the polysaccharide sheath material. No encrustation and infilling of microbial material by silica has been observed at this stage.

Fajardo-Cavazos P. Schuerger A. C. Nicholson W. L.
Persistence of Biomarker ATP in Cells and Spores on Mars: Implications for Astrobiology and Planetary Protection [#2416]
The biosignature molecule ATP was found to persist in bacterial cells and spores long after they were inactivated by exposure to simulated Mars environmental conditions.

Nicholson W. L. Möller R. Douki T. Robles J. Bruno G. Fajardo-Cavazos P. Schuerger A. C.
DNA Strand Breaks, Photoproducts, and Repair in Analog Space and Mars Environments: Implications for Microbial Interplanetary Transfer [#2182]
Bacterial spores are considered good candidates for interplanetary transport by natural impacts or human spaceflight. In this work we consider the mechanisms of DNA damage and repair in spores subjected to a hypothetical Earth-to-Mars transfer.

Basu A.
Antiquity of Ediacaran Fossils, Early Shelled Organisms, Recent Radiometric Age-Dates from India and Ancestral Biota [#1870]
U-Pb zircon ages and Pb-Pb limestone ages assign Ediacaran and shelly fossils reported from India between 1750 and 950 Ma indicating ancestral diversification of metazoans. Simple bacterial life must have begun earlier and may be found in meteorites.

Alexandre M. R. Wang Y. Huang Y. Brearley A. J. Alexander C. M. O'D.
Effect of Thermal and Aqueous Alteration on the Composition of Monocarboxylic Acids in Carbonaceous Chondrites [#2101]
Our goal in this study is to investigate the effect of thermal and aqueous alteration on the composition of MCAs in three different meteorite samples: Orgueil (CI1); EET 87770 (CR2); MET 00430 (CV3).

Spencer M. K. Zare R. N.
Generation of Complex Aromatic Hydrocarbons During Atmospheric Entry of an Artificial Meteor [#2508]
To gain a comprehensive view of organic destruction and/or alteration during the atmospheric entry of exogenous organic material we treated the NASA Stardust Mission Sample Return Capsule as an artificial meteor.

Abramov O. Mojzsis S. J.

Thermal Modeling of the Terrestrial Lithosphere During the Late Heavy Bombardment [#1036]

The purpose of this study is to assess the habitability of early Earth during the late heavy bombardment using a thermal model of the lithosphere. The preliminary results favor the survival of subsurface microbial life throughout the bombardment.

Baird L. M. Levin S. M. Van Houten K. A. Pilato R. S. Murray G. M. Izenberg N. R.

Detection of Biological Molecules via Molecularly Imprinted Molecules Coupled with Surface Plasmon Resonance [#1975]

A series of molecularly imprinted polymers (MIP) were developed for use in the detection of biological molecules of astrobiological interest via surface plasmon resonance.