

Wednesday, March 12, 2008
ASTROBIOLOGY: BIOSIGNATURES, IMPACTS, HABITABILITY
8:30 a.m. Amphitheater

Chairs: F. Westall
 J. G. Blank

- 8:30 a.m. Oehler D. Z. * Robert F. Meibom A. Mostefaoui S. Selo M. Walter M. Sugitani K. Allwood A. Mimura K. Gibson E. K.
"Nano" Scale Biosignatures and the Search for Extraterrestrial Life [#1303]
 NanoSIMS provides new insights for recognizing indigenous and valid biosignatures of fragments of ancient microbes that might be preserved in extraterrestrial samples.
- 8:45 a.m. Cavalazzi B. Westall F. * Barbieri R. Foucher F.
Astrobiological Implications of Microbes in Basaltic Pillow Lava Crusts: A Case Study from Recent (Bio-)Alteration Rims, Coral Patch Seamount, Atlantic Ocean [#1633]
 Discoveries of microorganisms living within modern oceanic (glass) crust have demonstrated the crucial role of microbes in bio-alteration processes. We describe the detect ion potential for microfossil biosignatures in the altered rims of recent pillow lava.
- 9:00 a.m. Steele A. * Amundsen H. E. F. Mysen B. Fogel M. L. Schweizer M. Kater L. Boctor N.
An Abiotic Organic Synthesis Mechanism on Mars [#2542]
 We describe for the first time an abiotic organic synthesis mechanism on Mars from studies of ALH 84001.
- 9:15 a.m. Westall F. * Lemelle L. Simionovici A. Southam G. MacLean L. Salomé M. Wirick S. Toporski J. Jauss A.
Vertical Geochemical Profiling Across a 3.33 Ga Microbial Mat from Barberton [#1636]
 The Josefdal Chert (3.33 Ga), Barberton, contains a superbly preserved microbial mat. High resolution geochemical profiling across the mat documents textures and compositions indicative of a mixed microbial community of anoxygenic photosynthesisers and probably SRBs.
- 9:30 a.m. Blank J. G. * Liu B. T. Lomov I. N. Antoun T. H.
Modeling Comet-Earth Collisions to Assess Survivability of Organic Materials During Impacts [#2237]
 We modeled comet-earth collisions over a range of impact angles using a 3D hydrocode and water-ice as our comet proxy; we tracked the material state of the ice during impact and inferred survivability of organic materials exposed to a similar impact scenario.
- 9:45 a.m. Kurosawa K. * Ishibashi K. Sugita S. Kadono T. Ohno S. Matsui T.
An Experimental Study on HCN Production in Redox-Neutral Atmospheres by Oblique Impacts: Size and Velocity Scaling [#2037]
 We conducted laser ablation experiments using graphite targets and redox-neutral atmospheres to investigate chemical reactions after an oblique impacts on the early Earth. The results indicate that a large amount of HCN may be produced under planetary-scale impacts.
- 10:00 a.m. Vago J. L. * Kminek G. Haldemann A. Baglioni P. Elfving A. McCoy D. Gianfiglio G. Gardini B.
Upcoming Science Activities in Support of ESA's ExoMars Mission [#1235]
 The paper presents the science content and definition progress of ESA's ExoMars rover mission. It also introduces upcoming activities of interest to the international Mars science community.

- 10:15 a.m. Ulrich R. * Pilgrim R. Chevrier V. F. Roe L. Kral T.
Temperature Fields at Mars Landing Sites: Implications for Subsurface Biology [#1341]
Subsurface temperatures were calculated for the five successful landing sites and compared to those required for support of microbial life and associated necessary aqueous solutions.
- 10:30 a.m. Tierney L. L. * Jakosky B. M.
Assessing the Habitability of Meridiani Planum, Mars, Based on Thermodynamic Energy Requirements [#1396]
We evaluate the habitability of Meridiani Planum by calculating the amount of available geochemical energy that would have been available from low-temperature redox reactions and estimate the amount of biomass that may have been supported.
- 10:45 a.m. Fernández-Remolar D. C. * Menor-Salván C. Ruiz Bermejo M.
Differential Preservation of Biological Information Under the Global Acidic Conditions on Mars, an Approach from the Río Tinto Mars Analog and Its Implications for Searching Extinct Life on Mars [#1890]
Preservation windows of acidic environments are valuable tools to develop a strategy to search traces of extinct life in materials originated during the Noachian on Mars. We show different preservation windows recognized in the Río Tinto Mars analog.
- 11:00 a.m. Altheide T. S. * Kral T.
Low-Pressure Desiccation Effects on Methane Production by Methanogens [#1108]
We report on research designed to determine if certain species of methanogens can survive desiccation, with and without JSC Mars-1 soil simulant, at Mars surface pressure of 6 mbar.
- 11:15 a.m. Hirschmann M. M. * Withers A. C.
Ventilation of CO₂ from a Reduced Mantle and Consequences for the Early Martian Greenhouse [#1928]
Thermodynamic calculations of the dissolved CO₂ concentration in basalts saturated with graphite suggest that the volcanogenic ventilation of CO₂ from the martian mantle may be severely limited under reducing conditions.
- 11:30 a.m. Mojzsis S. J. * Cates N. L.
"MIF in BIF" Provides Unique Clues to the Atmosphere-Hydrosphere System at the Hadean/Archean Transition on Earth [#1193]
Mass-independent sulphur isotopes in the oldest banded iron-formations provide insight into the composition of the earliest atmosphere, fuel the debate about whether BIFs were biotic, and important data in the search for extrasolar early Earths.