

**Thursday, March 16, 2006**  
**ASTROBIOLOGY**  
**1:30 p.m. Amphitheater**

**Chairs: C. C. Allen**  
**B. Gladman**

- 1:30 p.m. Banerjee N. R. \* Furnes H. Simonetti A. Muehlenbachs K. Staudigel H. de Wit M. van Kranendonk M.  
*Ancient Microbial Alteration of Oceanic Crust on Two Early Archean Cratons and the Search for Extraterrestrial Life* [#2156]  
 We demonstrate that biosignatures are preserved in basaltic glass from *in situ* oceanic crust and ophiolites as far back as the early Archean and show how our methods could be applied to the search for life on Mars and other extraterrestrial bodies.
- 1:45 p.m. Cates N. L. \* Mojzsis S. J.  
*Geochronology and Geochemistry of a Newly Identified Pre-3760 Ma Supracrustal Sequence in the Nuvvuagittuq Belt, Québec, Canada* [#1948]  
 We report geochronology, geochemistry and mapping of a newly discovered pre-3760 Ma supracrustal (volcanosedimentary) locality from northern Québec, Canada.
- 2:00 p.m. Dauphas N. \* Cates N. L. Mojzsis S. J. van Zuilen M. Wadhwa M. Janney P. E. Busigny V. Davis A. M.  
*The Iron Isotopic Composition of 3.7–3.8 Ga Chemical Sediments: Comparison Between Isua (Greenland) and Nuvvuagittuq (Northern Quebec)* [#1053]  
 The BIFs in the 3.7–3.8 Ga Nuvvuagittuq Belt have heavy Fe isotopic compositions, similar to those measured in the better-characterized Isua Supracrustal Belt. This is the first time in 40 years that an early Archean supracrustal belt has been opened up for study.
- 2:15 p.m. Lindsay J. F. \* Bennett V.  
*The Late Archean Biospheric Explosion* [#1174]  
 Concretionary structures are abundant in late Archean rocks. They provide evidence for a rapid expansion of the biosphere in the late Archean. This expansion coincides with the assembly of the first continents and the initiation of plate tectonics.
- 2:30 p.m. Oehler D. Z. \* Mostefaoui S. Meibom A. Selo M. McKay D. S. Robert F.  
*"Nano" Morphology and Elemental Signatures of Early Life on Earth: A New Tool for Assessing Biogenicity* [#1067]  
 NanoSIMS reveals new structural and elemental markers of early life on Earth. These biosignatures may aid in assessments of problematic organic materials, such as those in early Archean sediments and any that may occur in Martian samples.
- 2:45 p.m. Grimm R. E. \* Bullock M. Dec S. Jepsen S. Olhoeft G. Painter S. Priscu J.  
*Unfrozen Groundwater in the Martian Cryosphere* [#2090]  
 Thin films of unfrozen water at subfreezing temperatures may provide permanent microbial habitats in the deep cryosphere of Mars or transiently at the surface.
- 3:00 p.m. Allen C. C. \* Oehler D. Z. Venechuk E. M.  
*Prospecting for Methane in Arabia Terra, Mars — First Results* [#1193]  
 We are using orbital data and methodologies derived from petroleum exploration in an attempt to locate the release points of methane on Mars. Southwest Arabia Terra, particularly in the area of 2 to 12 N, 5 to 12 W, is a prime area for detailed exploration.

- 3:15 p.m. Basilevsky A. T. \* Werner S. Neukum G. van Gasselt S. Head J. W. Ivanov B. A.  
*Potential Life Habitat at the Eastern Flank of the Olympus Mons as Seen in MEX HRSC and MGS MOC Images of Mars* [#1179]  
East of Olympus Mons there are channel networks carved by water and/or lava and postdating them wrinkle ridges and volcanic ridges/chains of cones. Such channels and wrinkle ridges are typically Hesperian, but here they are very young (<26 Myr).
- 3:30 p.m. Leticariu L. \* Pratt L. M. LaVerne J. A. Ripley E. M.  
*Experimental Study of Radiolytic Oxidation of Pyrite: Implications for Mars-relevant Crustal Processes* [#1953]  
Crustal radiolysis is an efficient mechanism in the production of oxidizing species in geologically long-lived oxidizing systems that has profound implications for assessing microbial metabolism in the deep subsurface on Earth and Mars.
- 3:45 p.m. Nicholson W. L. \* Fajardo-Cavazos P. Langenhorst F. Melosh H. J.  
*Bacterial Spores Survive Hypervelocity Launch by Spallation: Implications for Lithopanspermia* [#1808]  
Spores of *Bacillus subtilis* were demonstrated to survive launch by spallation from a granite target initiated by a high-speed (5.4 km/s) impact using the NASA Ames Vertical Gas Gun.
- 4:00 p.m. Stöffler D. \* Meyer C. Fritz J. Horneck G. Möller R. Cockell C. Ott S. de Vera J. P. Hornemann U. Artemieva N. A.  
*Impact Experiments in Support of "Lithopanspermia": The Route from Mars to Earth* [#1551]  
Shock recovery experiments on a Martian analogue rock (gabbro) loaded with three types of microorganisms reveal that these organisms survive the impact and ejection phase on Mars at shock pressures up to about 50 GPa with exponentially decreasing survival rates.
- 4:15 p.m. Gladman B. \* Dones L. Levison H. Burns J. Gallant J.  
*Meteoroid Transfer to Europa and Titan* [#2165]  
Via extensive numerical simulations, we calculate the delivery efficiency of terrestrial impact ejecta to Europa and Titan. We show that (perhaps surprisingly) in an averaged large-scale impact (KT-level) a few to a hundred terrene meteoroids reach Europa and Titan.
- 4:30 p.m. McKay D. S. \* Clemett S. J. Thomas-Keprta K. L. Wentworth S. J. Gibson E. K. Jr. Robert F. Verchovsky A. B. Pillinger C. T. Rice T. Van Leer B.  
*Observation and Analysis of In Situ Carbonaceous Matter in Nakhla: Part I* [#2251]  
New analyses of indigenous secondary material in the martian meteorite Nakhla reveal amorphous carbon-rich veins and dendrites. The texture and chemistry of this material resembles that of biogenically altered sub-ocean basaltic glasses.