

Thursday, March 18, 2004

ASTROBIOLOGY: ANALOGS AND APPLICATIONS TO THE SEARCH FOR LIFE
8:30 a.m. Salon C

Chairs: D. S. McKay
D. Z. Oehler

- 8:30 a.m. Westall F. * Hofmann B. Brack A.
The Search for Life on Mars Using Macroscopically Visible Microbial Mats (Stromatolites) in 3.5–3.3 Ga Cherts from the Pilbara in Australia and Barberton in South Africa as Analogues [#1077]
Microbial mats from early terrestrial environments can be macroscopically visible and represent excellent analogues in the search for life on Mars. Tests using the Beagle 2 camera show that they can be observed by in situ instrumentation.
- 8:45 a.m. Amundsen H. E. F. * Steele A. Fogel M. Kihle J. Schweizer M. Toporski J. Treiman A. H.
Life in a Mars Analog: Microbial Activity Associated with Carbonate Cemented Lava Breccias from NW Spitsbergen [#2119]
Carbonate cemented lava breccias from NW Spitsbergen show evidence of microbial activity within lava vesicles.
- 9:00 a.m. Schieber J. *
Groundwater-fed Iron-rich Microbial Mats in a Freshwater Creek: Growth Cycles and Fossilization Potential of Microbial Features [#1369]
Study of modern microbial mats produced by iron precipitating microbes. Aging and compaction experiments to evaluate fossilization potential and likelihood to recognize these deposits in the rock record.
- 9:15 a.m. Velbel M. A. * McGuire J. T. Madden A. S. Brandt D. S. Long D. T.
Episodic Fossilization of Microorganisms on an Annual Timescale in an Anthropogenically Modified Natural Environment: Geochemical Controls and Implications for Astrobiology [#2042]
Fossilization of microorganisms took place in less than a year under biogeochemical conditions similar to (1) other instances of exceptional fossil preservation, and (2) those believed to exist in some settings of astrobiological significance.
- 9:30 a.m. Oehler D. Z. * Walter M. R.
Proterozoic Microfossils and Their Implications for Recognizing Life on Mars [#1018]
Indisputably biogenic Proterozoic microfossils can serve as a guide for assessing potential evidence of life on Mars.
- 9:45 a.m. Banerjee N. R. * Furnes H. Muehlenbachs K. Staudigel H.
Microbial Alteration of Volcanic Glass in Modern and Ancient Oceanic Crust as a Proxy for Studies of Extraterrestrial Material [#1248]
We demonstrate that biosignatures are preserved in basaltic glass from in situ oceanic crust and ophiolites as far back as the Archean and show how our methods could be applied to the search for life on Mars and other extraterrestrial bodies.
- 10:00 a.m. Fisk M. R. * Popa R. Storrie-Lombardi M. C. Vicenzi E. P.
Olivine Alteration on Earth and Mars [#1746]
Aqueous alteration of the common, magnesium-iron silicate mineral, olivine, is examined in terrestrial and Mars rocks. “Biotic” and abiotic alteration textures are compared.
- 10:15 a.m. BREAK

- 10:30 a.m. Fernández-Remolar D. C. * Prieto-Ballesteros O. Stoker C.
Searching for an Acidic Aquifer in the Rio Tinto Basin. First Geobiology Results of MARTE Project [#1766]
First results obtained during the 2003 ground truth campaign of MARTE Project (Mars Analog Research and Technology Experiment).
- 10:45 a.m. Steele A. * Schweizer M. Amundsen H. E. F. Wainwright N.
In-Field Testing of Life Detection Instruments and Protocols in a Mars Analogue Arctic Environment [#2076]
We describe the testing of four portable instruments in an Arctic analogue environment for Mars. The instruments include ATP luminometry, LAL assay, Digital Microscopy and in field DNA extraction and PCR.
- 11:00 a.m. McKay D. S. * Wentworth S. J. Thomas-Keprta K. L. Clemett S. Gibson E. K.
Habitability of the Shallow Subsurface on Mars: Clues from the Meteorites [#1786]
Here we present a summary of independent data from the Mars meteorites showing that liquid water was present for at least some of the time in the upper few meters or tens of meters as early as 3.9 billion years (Ga), and was present at intervals throughout most of Mars history.
- 11:15 a.m. Stoker C. * Dunagan S. Stevens T. Amils R. Gómez-Elvira J. Fernández D. Hall J. Lynch K. Cannon H. Zavaleta J. Glass B. Lemke L.
Mars Analog Rio Tinto Experiment (MARTE): 2003 Drilling Campaign to Search for a Subsurface Biosphere at Rio Tinto Spain [#2025]
The results of an drilling experiment to search for a subsurface biosphere in a pyritic mineral deposit at Rio Tinto, Spain, are described. The experiment provides ground truth for a simulation of a Mars drilling mission to search for subsurface life.
- 11:30 a.m. Skrzypczak A. Derenne S. * Robert F. Binet L. Gourier D. Rouzaud J.-N. Clinard C.
Characterization of the Organic Matter in an Archean Chert (Warrawoona, Australia) [#1241]
The organic matter was isolated from a chert of the Warrawoona deposit and its chemical structure analysed using high resolution transmission electron microscopy, solid state nuclear magnetic resonance, infrared and electron paramagnetic resonance.
- 11:45 a.m. Glamoclija M. * Garrel L. López-García P.
The Solfatara Crater, Italy: Characterization of Hydrothermal Deposits, Biosignatures and Their Astrobiological Implication [#1227]
Solfatara is geologically young, subareal, volcanic formation, with a hot (~95°C) and acidic (pH 1.7) environment, potentially good terrestrial analogue to Mars. We demonstrate necessity of multidisciplinary investigation in search for biosignatures.