
Mineralogy of ~1-10 Micrometer Iron Spheres Within 3.4 Ga Rocks (Towers Formation, Warrawoona Group, Northwestern Australia) [#2101]
Iron-bearing spherules in Archean Warrawoona rocks are composed of hematite and goethite. They are clearly syngenetic with the rock but their origin, whether biological or abiogenic, is not yet known.

Walsh M. M. Westall F.
Revisiting the Swaziland Supergroup: New Approaches to Examining Evidence for Early Life on Earth [#1932]
The re-examination by SEM of 3.4 Ga fossiliferous carbonaceous cherts reveals fungal contaminants in addition to indigenous microfossils. Weathered volcanic flows associated with fossiliferous chert layers offer a promising area for further study of early life on Earth.

Nankivell A. Andre N. Thomas-Keprta K. Allen C. McKay D.
Sulphur Spring: Busy Intersection and Possible Martian Analogue [#1892]
Life in extreme environments exhibiting conditions similar to early Earth and Mars, such as Sulphur Spring, may harbor microorganisms serving as both relics from the past as well as present day Martian analogues.

DeStefano A. L. Ford J. C. Winsor S. K. Allen C. C.
Microbial Life in the Deep Subsurface: Deep, Hot and Radioactive [#1702]
Recent studies, motivated in part by the search for extraterrestrial life, continue to expand the recognized limits of Earth’s biosphere. This work explored evidence for life in high-temperature, radioactive environment in the deep subsurface.

Fernandez-Remolar D. Rodriguez N. Amils R. Prieto O.
The Sulfuric Chemistry in the Terrestrial System of Tinto River and Europa: A Comparison [#1679]
In order to establish chemical relationships between the terrestrial and Europa systems the ion complex in the water solution and the resulting mineral phases in the Tinto River is being studied and the correspondent (bio)chemical dynamics of the system studied.

Wu Y. Chafetz H. S.
Fractionation of $\delta^{13}C$ Values Between the Carbonate Mud-Mounds and the Coeval Adjacent Limestone: Evidence of Microbes(?) [#1106]
The shift in $\delta^{13}C$ values between carbonate mud-mounds and coeval adjacent limestone may provide a biomarker to recognize the former presence of microbial life in ancient carbonates.

Guidry S. A. Chafetz H. S. Steele A. Toporski J. K. W.
A Preliminary TOF-SIMS Assessment of Preservation Potential of Organic Biomarkers in Modern Siliceous Sinter and Core, Yellowstone National Park, Wyoming [#1100]
Until recently, most biomarker work has focused on morphological body fossils. As a complement to this, three suites of siliceous precipitates were chosen for ToF-SIMS investigation in order to elucidate potential organic biomarkers.
Basiuk V. A.  Bogillo V. I.

Theoretical Study of Amino Acid Precursor Formation in Interstellar Medium. 2. Reaction of Methylenimine with CN Radical [#1010]
The results of ab initio quantum chemical study are presented for the reaction of methylenimine with CN radical. The reaction is possible in interstellar medium due to the absence of a positive activation energy barrier and to a high exothermicity.

Basiuk V. A.  Bogillo V. I.

Theoretical Study of Amino Acid Precursor Formation in Interstellar Medium. 1. Reaction of Methylenimine with Hydrogen Cyanide [#1008]
The results of ab initio quantum chemical study are presented for the reaction of methylenimine with HCN. Three high-energy transition states were found, which make this reaction hardly possible in interstellar clouds.

Basiuk V. A.  Douda J.

Survivability of Small Biomolecules During Extraterrestrial Delivery: Simulation Experiments on Amino Acid Pyrolysis [#1007]
The results of simulation experiments on the pyrolysis of amino acids under 400°–1000°C are presented, and implications for the extraterrestrial delivery are discussed.

Basiuk V. A.

Quantum Chemical Calculations of Infrared Spectra for Identification of Unknown Compounds in Exobiological Simulation Experiments [#1006]
Quantum chemical calculation of IR spectra is suggested for the identification of unknown compounds in exobiological simulation experiments (thermal chemistry of extraterrestrial amino acids and Titan atmospheric chemistry).

Gerasimov M. V.  Dikov Yu. P.  Yakovlev O. I.  Wlotzka F.

On the Possibility of Hydrocarbons Synthesis During an Impact [#1259]
Impact simulated vaporization of silicates shows efficient hydrocarbons formation in the vapor cloud. The formation of hydrocarbons proceeds efficiently at decreasing temperature and probably due to heterogeneous catalysis.

Van Cleave K. A.  Robbins L. L.  Bell M. S.

Microbial Alteration of Maskelynite: Implications for ALH 84001 [#2006]
To assess the origin of Fe and Mg-enriched carbonates associated with maskelynite in ALH 84001, we are conducting experiments involving the microbial alteration of feldspathic glass and any microbially-induced precipitation which results during this process.

Kliman D. M.  Cooper J. B.  Anderson R. C.

Martian Soil Plant Growth Experiment: The Effects of Adding Nitrogen, Bacteria, and Fungi to Enhance Plant Growth [#1871]
Plant growth is enhanced by the presence of symbiotic soil microbes. In order to better understand how plants might prosper on Mars, we set up an experiment to test whether symbiotic microbes function to enhance plant growth in a Martian soil simulant.

Allen C. C.  Griffin C.  Steele A.  Wainwright N.  Stansbery E.

Microbial Life in Martian Regolith Simulant JSC Mars-1 [#1287]
JSC Mars-1 is a Martian regolith simulant developed to support research, instrument development, and education. This study measures the simulant’s concentration of cellular material and quantifies and identifies a subset of the microbial population.
Nelson D. M.  Farmer J. D.  Greeley R.
*Isidis Rim, Mars, as a Potential Site for Astrobiology [#1232]*
Isidis Rim, Mars, is of interest for Astrobiology because of valley networks dissecting Noachian highlands. We have produced a geologic map of the Isidis Rim and targeted potential landing ellipses for future landed missions.

Jakosky B. M.  Braun L. R.  Mellon M. T.  Pelkey S. M.
*High-Resolution Thermal-Inertia Mapping of Mars: Sites of Exobiological Interest [#1858]*
We use thermal inertia derived from MGS TES data to constrain physical properties of sites of exobiological interest on Mars.

Newsom H. E.  Bishop J. L.  Cockell C.  Rousch T.  Johnson J. R.
*The Search for Life on Mars in Surface Samples: Lessons from the 1999 Marsokhod Field Test [#1931]*
A rock with possible cryptoendolithic organisms was identified on the basis of a green tinge and textural information, which was confirmed by the identification of chlorophyll visible/NIR spectra.

Gaidos E. J.
*Geophysics of an Oceanic Ice Shell on Snowball Earth [#1107]*
Kirschvink proposed Precambrian low-latitude glaciation could result in an albedo-driven catastrophic runaway to a “Snowball Earth” state in which pack ice up to 1 km thick covered the world ocean. The geophysical state of an ice crust on a Snowball Earth is examined.