

Thursday, June 14, 2012
SCIENCE AND MISSION CONCEPTS:
ORGANIC MOLECULE AND LIFE DETECTION
8:00 a.m. Berkner Room

Allen M. * Wennberg P. O. Schofield J. T. Hipkin V.

[Searching for Evidence of Extant Subsurface Biological and Geological Processes from Mars Orbit](#) [#4104]

Central goals for the Mars Exploration Program in the Planetary Decadal Survey are (1) has life ever arisen on Mars and (2) the Mars climate system. Measurements described address these goals and support future human exploration of the planet.

Bebout B. M. * Bramall N. E. Kelley C. A. Chanton J. P. Tazaz A. Poole J. Nicholson B. Detweiler A. Gupta M. Ricco A. J.

[Methane as an Indicator of Life on Mars: Necessary Measurements and Some Possible Measurement Strategies](#) [#4205]

Methane would be tantalizing evidence in support of the presence of a biosphere on Mars. OA-ICOS is a technology for the reliable detection of methane, as well as other alkanes and their isotopologues necessary to determine its biogenicity.

Gibson E. K. * Pillinger C. T. Wright I. P. Hurst S. J. Richter L. Sims M. R.

[How do you Answer the Life on Mars Question? Use Multiple Small Landers like Beagle 2](#) [#4217]

Beagle 2 lander is a flight qualified scientific payload and it offers a unique suite of instruments which can offer answers to the life on Mars question. Using multiple Beagle 2 landers on Mars offers a low-cost and outstanding scientific option.

Sims M. R. Cullen D. C. Sephton M. A. Bulloch C. Borst G. Leeuwis H. Norfini A. Brucato J. Holm N. Steele A. * Ehrenfreund P.

[The Life Marker Chip \(LMC\) instrument — Antibody-Based Detection of Organic Molecules and Biomarkers in Martian Samples](#) [#4306]

The Life Marker Chip (LMC) is being developed for the 2018 ExoMars mission for the detection of multiple organic molecules, e.g., biomarkers of life, in rock and regolith samples using low temperature solvent extraction and multiplexed immunoassays.

Brinckerhoff W. B. * van Amerom F. H. W. Danell R. M. Pinnick V. Arevalo R. Atanassova M. Li X. Mahaffy P. R. Cotter R. J. The MOMA Team

[Mars Organic Molecule Analyzer Mass Spectrometer for 2018 and Beyond](#) [#4236]

We present details of the Mars Organic Molecule Analyzer (MOMA) investigation, with a focus on its mass spectrometer subsystem, a core part of the sample analysis capability of ExoMars, and potentially for NASA Mars missions in 2018/2020 and beyond.

Bramall N. E. * Allamandola L. J.

[Native Fluorescence for the Detection of Organics](#) [#4299]

Fluorescence spectroscopy is a powerful tool for the detection of aromatic organics, a particularly important class of organics due to their ubiquity and stability under UV irradiation. We propose a strategy and describe a small instrument.

Parro V. * Rivas L. A. Sebastián E. Blanco Y. Rodríguez-Manfredi J. A. de Diego-Castilla G. Moreno-Paz M. García-Villadangos M. Compostizo C. Herrero P. L. García-Marín A. Martín-Soler J. Romeral J. Cruz-Gil P. Prieto-Ballesteros O. Gómez-Elvira J.

[The SOLID3 \(“Signs of Life Detector”\) Instrument: An Antibody Microarray-Based Biosensor for Planetary Exploration](#) [#4065]

SOLID is a lab-on-a-chip powerful analytical instrument based on antibody array technology, that can detect a broad range of molecular size compounds, from amino acids to cells. SOLID is –now at TRL 5-6 and is compatible with martian soil chemistry.

Cable M. L. * Nosanov J. P. Amini R. B. Trease B. P. Ponce A.

[Martian Sub-Surface Detection of Earth-Like Bacterial Spores](#) [#4338]

NASA’s replanned Mars Program should include life detection. A fluorescence-based technique could detect life — bacterial spores — beneath the martian surface while leveraging flight heritage hardware and informing human operations and sample return.

PANEL DISCUSSION