

Thursday, April 27, 2017

**NEW TECHNOLOGIES AND TECHNIQUES: LIFE DETECTION:
IN SITU LIFE DETECTION: APPROACHES, CHALLENGES, AND OPPORTUNITIES
1:30 p.m. Mesa Room**

**Chairs: Daniel Gregory
Aaron Burton**

- 1:30 p.m. Clark M. V. Heinz J. Kounaves S. P. Schirmack J. Schulze-Makuch D. *
[*Unambiguous In-Stu Life Detection Using a Microbial Growth Sensing Array*](#) [#3248]
The sensor technology described here will allow for the unambiguous detection of both growth and reproduction, i.e., life detection.
- 1:45 p.m. Smith H. D. * Duncan A. G. Sims R. C. Neary P. L. Lloyd C. R. Anderson A. J. McKay C. P.
[*In-Situ Detection of Organics and Biomolecules via Native Fluorescence*](#) [#3665]
This presentation demonstrates the benefits of light weight, low power LED's for in-situ non-contact detection of universal biomolecules to life as we know it.
- 2:00 p.m. Gregory D. D. * Cracknell M. J. Figueroa M. Large R. R. Kuhn S. Stepanov A. S. Fox N.
Baker M. J. Maslennikov V. V. Belousov I. A. Lyons T. W.
[*Identifying Biogenic Pyrite Using Random Forests™ Analysis of In Situ Laser Ablation-ICPMS Trace Element Data*](#) [#3699]
This study demonstrates how the trace element content of pyrite, coupled with Random Forests' data analysis, can be used to distinguish biogenic pyrite from abiotic.
- 2:15 p.m. Carr C. E. * Mojarro A. Hachey J. Pontefract A. Doebler R. Brown M.
Ruvkun G. Zuber M. T.
[*Progress and Challenges for Life Detection via Nucleic Acid Sequencing*](#) [#3395]
We describe progress in developing the Search for Extra-Terrestrial Genomes (SETG), and remaining challenges for life detection via nucleic acid sequencing.
- 2:30 p.m. Whitaker T. J. * Anderson F. S.
[*Detection of DNA and DNA Analogues Using Time Correlated Single-Photon Counting*](#) [#3506]
A photon-counting technique is presented for detecting the presence of DNA or DNA-like molecules on extraterrestrial bodies such as Europa or Enceladus.
- 2:45 p.m. Mora M. F. * Bramall N. Kehl F. Noell A. Willis P. A.
[*Microchip Electrophoresis Instrumentation for Determination of Chemical Distributions of Organic and Inorganic Ions on Future Spaceflight Missions*](#) [#3561]
We present microchip electrophoresis instruments for detection of organic and inorganic ions using fluorescence and contactless conductivity detection.
- 3:00 p.m. Arevalo R. Jr. * Danell R. Southard A. Hernandez E. Hovmand L. Tan F. Grubisic A.
Gundersen C. Mahaffy P. Trainer M. Brinckerhoff W. Getty S. Cottin H. Briois C. Colin F.
Thirkell L. Szopa C. Vuitton V. Reinhardt-Szyba M. Makarov A.
[*Exploration of Cryogenic Environments via Ultrahigh Mass Resolution with the AROMA Investigation*](#) [#3161]
Motivation, instrument design, and recent developments for the Advanced Resolution Organic Molecule Analyzer (AROMA) investigation are presented.
- 3:15 p.m. Oberlin E. A. * Kounaves S. P. Noell A. C. Quinn R. C. Ricco A. J. Gold R. E.
[*Determining Habitability of Icy World Oceans via Analysis of Plume Particles*](#) [#3251]
Finding that subsurface oceans on Enceladus contain habitable environments would be of major significance, regardless of whether or not life was detected.

- 3:30 p.m. Getty S. A. * Grubisic A. Li X. Cornish T. Uckert K. Farcy B. Brinckerhoff W. B.
[*A Compact Laser Mass Spectrometer for Biosignature Detection in Planetary Ice*](#) [#3299]
A mass spectrometer targeted to the chemical analysis of trace biosignatures and habitability indicators will also enable detection of unexpected chemistries.
- 3:45 p.m. *Coffee Break*