LIFE: PRINT ONLY

Airapetian V. S. Danchi W. C. Chen P. C. Rabin D. M. Carpenter K. G. Mlynczak M. G.
Detecting the Beacons of Life with Exo-Life Beacon Space Telescope (ELBST) **[#8214]**
We propose a new observational strategy, the "Exo-Life Beacon Space Telescope," for detecting the signatures of "beacons" of life defined as high signal and low spectral resolution thermal emission from molecules associated with life signatures.

Atri D.
Strategies for Detecting Radiolysis-Powered Ecosystems Beyond Earth **[#8112]**
I will discuss the possibility radiolysis-powered ecosystems (based on D. audaxviator) within our solar system, their potential signatures and propose detection strategies for future planetary science missions.

Blake D. F. Sarrazin P.
Definitive Mineralogy of Rocky and Icy Planets and Planetesimals Using Powder X-Ray Diffraction **[#8068]**
X-ray diffraction is a definitive technique for mineral identification, quantification, and composition. Definitive mineralogical analysis can identify modern and ancient habitable environments and provide context for other measurements.

Bonaccorsi R. Wilson D. Davila A. Stoker C. R. McKay C. P.
Life Detection in Briny Environments: An Integrated Approach for Accessing and Detecting Biomarkers on Mars and in the Solar System **[#8246]**
Our vision for the late 2020's involves a suite of life-detection tools able to detect life in a variety of terranes, environments, and complex geological matrices.

Burke D. H.
The Many Ways to Invent Biology **[#8249]**
The next 35 years will see tremendous advances in defining how life can arise spontaneously, and these advances will guide missions to look for life beyond Earth.

Craft K. L. Bradburne C. Tiffany J. Hagedon M. Hibbitts C. Vandegriff J. Horst S.
In-Situ Sample Preparation Development for Extraterrestrial Life Detection and Characterization **[#8230]**
In-situ life detection instrumentation require robust sample preparation techniques that need further development in the coming years to enable the exciting life discoveries we seek in both familiar and unfamiliar planetary environments.

Crouch J. Waite J. H. Reh K. Bolton S. Lorenz R. D. Hand K. P. Glein C. German C. R.
Ocean Worlds Explorer **[#8187]**
Ocean Worlds have been identified as an important destination in looking for life in the outer solar system. This search will remain limited until such time as we can deploy a submersible spacecraft to investigate those oceans' interior.

Daldorff L. K. S. Glocer A. Cohen O.
Modeling Needs for Advancing Solar System Exploration: Magnetosphere-Ionosphere-Atmosphere-Surface-Interior Interactions **[#8111]**
Models of planetary systems are key to understanding how these environments evolve and the implications for the origin and evolution of life. To do this, we need models that couple every aspect of the system from the Sun all the way to the interior.

Domagal-Goldman S. Felton R. Guzewitch S. Conrad P. Pavlov A. Bleacher J.
Historical Recurring Slope Lineae: A Potential Not-Special Region to Search for Life **[#8221]**
We propose to use climate modeling, Mars orbital assets, and robotic rovers and landers to predict, identify, and physically study biologically inactive recurring slope lineae on Mars.

Eubanks T. M.
Nomadic ExoPlanets and the NASA Strategic Vision for 2050 **[#8169]**
The closest exoplanet is likely not to be Proxima Centauri b, but an as yet unknown nomadic exoplanet. I will describe how densely populated near-interstellar space is likely to be, and what steps should be taken to find our nearest neighbors.

Fesq L. M. Some R. R. Lay N. E. Castano R. Nesnas I. A. Castillo-Rogez J. C. Doyle R. J. Beauchamp P. M.
Autonomous Space Vehicles of the Future **[#8180]**
NASA's vision to seek out life in the far reaches of and possibly beyond our solar system will demand technology advances in computing, communication, and on-board reasoning to achieve more physically and cognitively-capable robotic space explorers.

Freund F. T.
Organic Synthesis in the Solid State — In the Seemingly Forbidding Hard, Dense Matrix of Olivine and Similar Minerals **[#8146]**
Synthesis of large, complex organic molecules in the dense matrix of minerals such as olivine has never before been considered. This is possibly the more likely path toward the origin of life.

Freund F. T.
Planetary Oxidation and Other Unsolved Riddles **[#8151]**
Minerals contain H_2 plus peroxy, Si-OO-Si. During weathering peroxy produces H_2O_2, injecting reactive oxygen species. This process forced early microorganisms to adapt to ever more oxidizing conditions and to "invent" oxygenic photosynthesis.

German C. R.
What can the Field of Oceanography Contribute to Ocean World Exploration? **[#8052]**
The most promising opportunities to find evidence for an independent origin of life beyond Earth by ~2050 lie in exploration of our outer solar system's Ocean Worlds. Harnessing knowledge embedded in our ocean research community should enhance this.

Hays L. E. New M. H. Voytek M. A.
2015 NASA Astrobiology Strategy Document and the Vision for Solar System Exploration **[#8141]**
The 2015 NASA Astrobiology Strategy represents inputs from nearly 200 Astrobiologists and describes the current state of the field and future goals for a broad range of research topics.

Hu Z. W.
In Situ Visualization of Hidden Life Forms with Phase Sensitive X-Ray Micro- and Nano-Imaging **[#8158]**
We demonstrate the potential to visualize and analyze the morphology and structures of organisms *in situ* on ocean worlds with high-resolution phase sensitive X-ray radiography and tomography.

Jones C. C.
Understanding the Electromagnetic Environment and Its Relationship to Life in the Cosmos and the Evolution of the Biosphere **[#8209]**
The relationship of life to the electromagnetic spectrum is another part of the puzzle in our quest to find and support life in the cosmos. Correlative and experimental evidence suggest this relationship is a relevant one and demands further study.

Kamakolanu U. G.
Chemical Reactions Impacting the Potential of Planetary Habitability **[#8166]**
The formation of building blocks of life might have been a two-step process. 1) Acid catalyzed cyclization reaction, resulting in the formation of substituted pyran moiety, and 2) ring opening of pyran resulting in chiral prebiotic precursor molecule.

Koehne J. E.
Electrochemical Detection of Biological Catalysts as Signatures of Extant Life **[#8188]**
Biochemical sensor arrays offer promising approaches to planetary exploration including small-payloads, large robotic missions, and human exploration. Our objective is to enable life detection during future missions to our solar system's icy worlds.

Lyons T. W.
Early Earth and Its Growing Value in the Search for Life on Exoplanets **[#8127]**
Early Earth is an essential part of exoplanet research. With increasing sophistication, we are able to model atmospheres for Earth's many alternative states and from our holistic views of those worlds provide a roadmap for atmospheric biosignatures.

Ridenoure R. Angel S. M. Aslam S. Gorius N. Hewagama T. Nixon C. A. Sharma S.
SmallSat Spinning Landers for Ocean Worlds Exploration Missions – Future ESPA-Class Hitchhikers **[#8152]**
It is recommended that spinning lander concept studies should proceed in the next few years so that the necessary technologies, power sources, landing legs, landing radar, and CubeSat science payloads can be matured and demonstrated by 2050.

Rivkin A. S. Castillo-Rogez J. C. Raymond C. A.
Ceres and Its Cousins in the Post-Dawn Era **[#8134]**
Dawn's visit to Ceres has shown its nature as an inner solar system icy world of possible astrobiological interest. Close spectral matches to Ceres have been identified, offering the opportunity for greater insight into all.

Som S M. Robinson T. D.
Observing Earth as an Exoplanet **[#8090]**
We propose an Earth observer mission on a hyperbolic trajectory, with a suite of instruments, continuously pointing at Earth, to validate models regarding how the Earth's biological spectral signatures change with observer distance and with seasons.

Stoker C. R.
Affordable Precursor Missions to Search for Life and Pave the Way for Human Exploration of Mars **[#8100]**
The goal of landing humans on Mars in the 2030s requires a precursor program to assess modern life on Mars and assess the water resource of near surface ground ice. Missions that address these issues are presented.