

Tuesday, June 16, 2015

PLENARY SESSION:

REAL LIFE OR FANTASY: BIOSIGNATURES OR ABIOSIGNATURES IN ASTROBIOLOGY

8:00 a.m. Grand Ballroom

8:00 a.m. *Daily Announcements*

8:10 a.m. *Real Life or Fantasy: Biosignatures or Abiosignatures in Astrobiology*

Moderator: Sonny Harman

**Panel Members: Shawn Domagal-Goldman
Nicola McLoughlin**

One of the fundamental pursuits of astrobiology is to find life elsewhere — a pursuit often complicated by natural processes masking or mimicking signals that we would normally attribute to the presence of life. Common life-detection criteria and a range of biosignatures and abiosignatures across several disciplines will be introduced.

A panel discussion will follow with topics such as historical false positives, current detection criteria, and the future strategies for identifying robust indicators of life and distinguishing these from abiotic mimics.

10:15 a.m. BREAK

PLENARY SESSION:

THE ORIGIN AND SUBSEQUENT EVOLUTION OF LIFE

9:15 a.m. Grand Ballroom

**Moderator: Nicholas Hud
Rachel Whitaker**

Recent years have witnessed dramatic advances in our understanding of the early steps in the transition from a prebiotic world to a world transformed by a biotic component. These early steps are presumed to include the evolution of collectively autocatalytic networks of molecules, as well as the evolution of protocells that define the boundary between living and non-living matter.

Since the earliest cellular life, innovations caused by gene duplication and divergence, novel gene fusions/fission, and transfer of genes between phylogenetically distinct groups have led to an explosive diversification of the metabolic and regulatory networks within cells, enabling colonization of new environmental niches as well as new mechanisms for cooperative interactions between cells. The hierarchy of life — genes within genomes, organelles within cells, cells within organisms, and organisms within societies — is not a starting condition of the evolutionary process, but an outcome of a series of major transitions in which units of low complexity combine to form units of high complexity. Ongoing revolutions in genomics and informatics are giving new insights into the processes by which such transitions occur.

10:15 a.m. BREAK