Iron-Tolerant Cyanobacteria as an Effective Tool to Study Early Evolution of Life and the Development of Biosignatures [#2342]

Modern understanding of microbial ecology provides a lens through which the accumulating knowledge of physiology, molecular phylogeny and Earth’s history can be integrated and focused on the phenomenon of prokaryotic evolution.

Multi-Layer Fuzzy Logic-based Expert System for Conducting Tier-Scalable Planetary Reconnaissance [#1257]

A fuzzy logic approach is proposed to design a multi-layer expert system that can be used to autonomously operate the deployment of a novel mission architecture termed “tier-scalable” for life-containing assessment of planetary bodies.

The Planetary Habitability Classification [#2396]

The suggested Planetary Habitability Classification (PHC) system provides a simple mechanism to compare the potential habitability of terrestrial-sized extrasolar planets with Earth and themselves.

New Insights into Natural Recorders of Planetary Surface Environments: The Role of Silica in the Formation and Diagenesis of Desert Varnish and Siliceous Sinter [#1272]

Desert varnish from the USA and sinter from NZ form in extreme environments and silica may play a significant role in their formation. If they follow similar preservation and diagenetic pathways, it is important to understand how their paleoenvironmental biosignatures change with time.

The Cairngorms as a Proposed Site for the Evaluation of Biosensing Equipment and Astrobiological Instrumentation [#1027]

The Cairngorms provides a good initial evaluation site for biosensing equipment and astrobiological instrumentation due to the variety and extremes of weather, ecology and terrain within a small, accessible area.