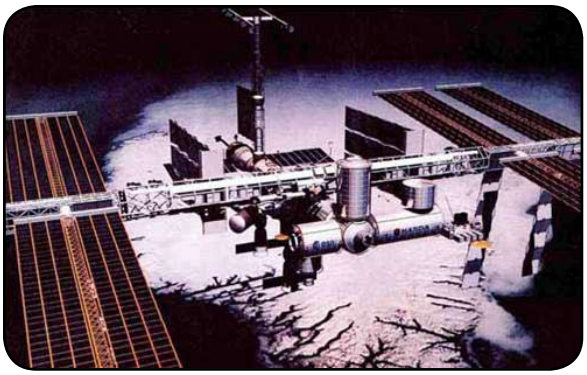
CSC/SETI Institute Colloquium Series



Rocco L. Mancinelli

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Extremophiles: What it takes for life to survive beyond the home planet

Wednesday, Dec. 5, 2:00pm
The SETI Institute, Europa room

Recently we have come to realize that where there is liquid water on Earth, virtually no matter what the physical conditions, no matter where, there is life. Environments we previously thought of as having insurmountable physical and chemical barriers to life, such as extremes in temperature, pH, and radiation, are now seen as yet another niche harboring "extremophiles". This realization, coupled with new data on the survival of microbes in the space environment, and modeling of the potential for transfer of life between planets suggests that life could be more common than previously thought. Data from recent Mars missions support the notion that Mars had abundant liquid water on its surface in the past, and has salts in its regolith. It could also have brine pockets that may either be an "oasis" for an extant biota, or the last refuge of an extinct biota. Characteristics that are important to better understand how life may survive conditions on Mars include radiation and desiccation resistance, as well as the ability to survive freeze/thaw cycles. To better understand what it takes to survive these conditions we study microbes and how they live, survive and die from the lagunas in the Bolivian altiplano to the space environment in Earth orbit. We have shown that terrestrial life can survive away from Earth in a simulated Mars environment and in the space environment. This research represents the first step in understanding what it takes for life to survive away from its home planet.

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