

Biosignatures of Life: The Microbe-to-Mineral Continuum on Earth and Prospects for Other Planets

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Earth's subsurface is a very different planet from the familiar one that we experience daily on the surface and in oceans. Unique microorganisms perform countless transformations of minerals and rocks, and live in habitat types including near-surface caves, aquifers, very deep sealed voids, multi-km deep mine adits, and minute fractures within igneous rock masses. This hidden world on our own planet is providing a living laboratory for developing ideas about how to look for life on other planets and moons in our Solar System, and beyond. I will show spectacular images from Earth's amazing caves, caves that we have discovered on Mars, the Moon, and elsewhere in our Solar System and discuss future missions to look for life outside of our home planet.

Biography: Dr. Penelope Boston is currently Senior Advisor for Science Integration at NASA Ames Research Center, in the Silicon Valley area of California. Research areas include geomicrobiology and astrobiology in extreme environments (caves and mines, hot and cold deserts, high latitudes and altitudes); geological processes creating caves on other planets; human life support issues in space/planetary environments; and robotics and other technologies to assist exploration and science in extreme Earth and extraterrestrial environments. Boston is author of over 200 technical and popular publications, editor of 4 volumes, and her work has featured in ~250 print and broadcast media outlets. Formerly, Boston served as Director of the NASA Astrobiology Institute (NAI, 2016-2019), and she was Professor and Department Chair of the Earth and Environmental Sciences Dept. at the New Mexico Institute of Mining and Technology (2002-2016). She is a poet, artist, animal adorer, and friendly.