

Opportunities and Exploration: A Panel Discussion on Planetary Subsurface Science

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Investigations of the three-dimensional structure of the Earth and other planetary bodies are transforming our understanding of the distribution and age of water, fluxes of elements like carbon in and out of the subsurface, character and density of energy and the nature of habitability and its limits. We are poised to frame the important fundamental questions concerning the complexities of chemical, physical and biological interactions in the Earth's subsurface, and by inference planetary bodies like Mars and Europa. This panel seeks to explore questions related to the subsurface architecture of planets by exploring geophysical and geochemical results from experiments and observations in deep mines and boreholes as well as modeling efforts. This panel discussion addresses the nature and diversity of crustal subsurface environments and our understanding of how the subsurface changes with geographic location and depth. This encompasses studies on the variability and cycling of carbon, water, and subsurface volatiles including brines, ices, clathrates, salts, methane, and oxidants. Our panel will also discuss studies related to the physical and chemical controls on planetary subsurface architecture that determines the storage, transport, and interaction of fluids and gases in the interiors of Earth and other moons and planets.

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