

What Lies Beneath

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Studies conducted by University of Arkansas researchers suggest locations where future Mars missions might seek liquid water underneath Martian soil.

Graduate students Kathryn Bryson and Daniel Ostrowski, postdoctoral researcher Vincent Chevrier and Derek Sears, director of the Arkansas Center for Space and Planetary Sciences, will present their findings Friday, March 16, at the Lunar and Planetary Sciences conference in Houston.

The researchers used a planetary environmental chamber to simulate conditions found on Mars - a carbon dioxide atmosphere, 7 millibars of pressure and temperatures near zero degrees Celsius. Bryson looked at the evaporation rates of ice buried beneath fine-grained basaltic soil at depths of 2.5 to 50 millimeters.

"Soil layers only 5 millimeters deep slowed the evaporation process and greatly increased the lifetime of an ice layer," Bryson said. A soil barrier on top of an ice layer can enable the formation of liquid water by slowing the evaporation rate and warming the surface.

Ostrowski examined the evaporation rates of ice beneath montmorillonite, an aluminum-rich clay recently shown to be present on Mars. Montmorillonite is a hydrated clay that requires the presence of water in some form for its creation.

Studies of the clay soil indicate that the diffusion rate doesn't become

steady as quickly as other non-clay materials do, possibly indicating that the clay is adsorbing water, either in liquid or gas form.

"This does not directly imply liquid water, but it does give the possibility if the conditions are right," Ostrowski said.

The upcoming Mars Phoenix Lander mission will be looking for environments similar to those investigated in these experiments, and scientists hope to find evidence for water - and possibly life -- in these regions.

Source: University of Arkansas

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