

SPACE EXPLORATION SYMPOSIUM (A3)
Mars Exploration – Part 1 (3A)

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THE DISCOVERY OF LIQUID WATER ON MARS AND ITS IMPLICATIONS

Abstract

This presentation discusses the discovery of liquid water on Mars by the Phoenix Lander and its implications for atmospheric chemistry and astrobiology.

NASA's Mars Exploration Program strategy of "following the water" has paid off tremendously and recent missions showed clear evidence that Mars had significant reservoirs of liquid water in the past. The discovery of evidence for brines and methane have excited the planetary science community by reviving the possibility of extant life on Mars, despite the fact that methane could also be produced by abiogenic processes. Indications that the concentration of methane varies in space and time are inconsistent with what is currently known about Mars.

The large spatial and temporal variability of the atmospheric concentration of methane suggests the existence of strong sources and sinks of this biologically interesting gas. Geothermal and aqueous processes in the shallow subsurface are possible sources of methane and other trace gases.

This presentation presents new, quantitative, evidence that Phoenix discovered liquid saline water on Mars. Moreover, it shows evidence that liquid saline water forms sporadically on Mars' polar region. Finally, it speculates that aqueous process in the shallow subsurface of Mars is a source of methane and other traces gases.