Mission Concepts

Smith P. H.
*The Phoenix Scout Mission* [#3257]
Phoenix offers the Scouts the first landed mission to the northern polar region. We land on the near-surface ice discovered by Odyssey, return descent, panoramic, and microscopic images and sample at depth with an arm to analyze the chemistry, geology, and biology of this potential habitable zone.

Bérczi Sz. Horváth A. Illés E.
*Comparison of the Cracking and Fracturing Systems of Phobos and Europa* [#3198]
We compare the models suggested to the origin of surface cracking and fracture systems of Phobos and Europa. On the basis of these models we propose imaging observations of Phobos to select between the layered or tidal fractured models.

Levine J. S. Summers M. E.
*Non-Equilibrium Thermodynamic Chemistry and the Composition of the Atmosphere of Mars* [#3055]
Equilibrium thermodynamic chemical calculations indicate that certain gases should not be present at detectable levels in the atmosphere of Mars in the absence of non-equilibrium thermodynamic chemical production, i.e., microbial metabolic activity.

Chamitoff G. E. James G. H. Barker D. C. Dershowitz A. L.
*Mars Mission Optimization Based on Collocation of Resources* [#3054]
A powerful approach for analyzing martian data and optimizing mission site selection is presented. Landing site optimization involves maximizing accessibility to collocated science and resource features within a given mission radius subject to mission constraints.

Brinckerhoff W. B. Mahaffy P. R. Cabane M. Atreya S. K. Coll P. Cornish T. J. Harpold D. N. Israel G. Niemann H. B. Owen T. Raulin F.
*Sample Analysis at Mars* [#3030]
Advanced techniques to carry out Sample Analysis at Mars (SAM) and reveal the nature of present or ancient biotic or prebiotic processes are described. The focus is the search for the location and nature of organic molecules and their chemical context in rock, ice, and atmospheric samples.

Houben H.
*Towards a Martian Weather Service* [#3074]
It may be possible to perform meteorological data assimilation onboard spacecraft in the near future, resulting in significant compression of the observational data and greatly enhanced prospects for airborne operations in the martian environment.