

Monday, March 17, 2003
MARS VOLCANISM
2:15 p.m. Salon B

Chairs: J. R. Zimbelman
W. L. Jaeger

Ori G. G. * Karna A.

The Uppermost Crust of Mars and Flood Basalts [#1539]

In recent years, the images of the camera of Mars Global Surveyor have shown that the upper part of the crust is extensively layered. These beds are remarkably exposed in the walls of Valles Marineris, but occur also extensively all over the planet.

Zimbelman J. R. * Peitersen M. N. Christensen P. R. Rice J. W.

Application of THEMIS Data to an Investigation of a Long Lava Flow in the Tharsis Montes Region of Mars [#1387]

THEMIS daytime IR and VIS images of a long lava flow west of Ascraeus Mons reveal new details not evident from earlier data. The low thermal inertia for this region provides a uniform covering that enhances detectability of subtle topographic effects at both visual and thermal wavelengths.

Sakimoto S. E. H. * Gregg T. K. P. Hughes S. S. Chadwick J.

Martian Plains Volcanism in Syria Planum and Tempe Mareotis as Analogs to the Eastern Snake River Plains, Idaho: Similarities and Possible Petrologic Contributions to Topography [#1740]

We compare martian volcanic shield topographic characteristics to topography of a similar range of shield features in the Eastern Snake River Plains of Idaho, where compositional variations are known to contribute to petrologic and topographic differences.

McGovern P. J. * Smith J. R. Morgan J. K. Bulmer M.

Olympus Mons Aureole Deposits and Basal Scarp: Structural Characteristics and Implications for Flank Failure Scenarios [#2080]

We examine the structure of the Olympus Mons basal scarp and aureole in order to evaluate flank failure scenarios. We apply insights from reconstructions of pre-failure geometry and numerical modeling of slope failure dynamics, inspired by Hawaiian analogues.

Chase Z. A. J. * Sakimoto S. E. H.

Thermal Modeling of Permafrost Melt by Overlying Lava Flows with Applications to Flow-Associated Outflow Channel Volumes in the Cerberus Plains, Mars [#1905]

Heat from observed lava flow thicknesses near an E. Cerberus region vent is modeled to determine if thermal pulses into the substrate can melt pore space ice sufficient to fill local small spatially related fluvial channel networks.

Mitchell K. L. * Wilson L. Head J. W. III

Dike Emplacement as a Mechanism for Generation of Massive Water Floods at Cerberus Fossae, Mars [#1332]

We model the release of the Athabasca Valles floodwater, getting results consistent with the morphology and topography of the Cerberus Fossae source. However, we have difficulty reconciling Burr et al.'s water volume fluxes with Darcy-type flow.

Jaeger W. L. * Keszthelyi L. P. Burr D. M. McEwen A. S. Baker V. R. Miyamoto H. Beyer R. A.

Ring Dike Structures in the Channeled Scabland as Analogs for Circular Features in Athabasca Valles, Mars [#2045]

Circular features in Athabasca Valles, Mars are similar in size, shape and geologic setting to ring dike structures in the Channeled Scabland. We examined three ring dikes near Odessa, WA. We present those data and discuss hypotheses for their formation.

Baloga S. M. * Glaze L. S. Crown D. A.

Scaling of Pahoehoe Flow Field Features [#1437]

Pahoehoe flow fields contain many different features with lengths that are lognormally distributed, indicating transitions between styles of emplacement. We consider a pahoehoe flow field to be a mixture of features that can be combined. The mixture takes on a new character that is logistic.

Lipkaman L. J. * Gregg T. K. P.

A's Versus Pahoehoe on Mars, Venus, and Earth: What Do Fractal Dimensions Actually Reveal? [#1389]

The use of fractal dimensions does not have the planetary application once thought. Fractal dimensions of lava-flow margins indicate emplacement style, not surface morphology. Furthermore, fractal behavior of flow margins breaks down at large scales.