

Monday, March 17, 2003
SPACE WEATHER ON AIRLESS BODIES:
OBSERVATIONS, EFFECTS, AND DEPTHS
2:15 p.m. Salon A

Chairs: D. T. Blewett
J. S. Delaney

Blewett D. T. * Warell J.

New Ground-based Spectral Observations of Mercury and Comparison with the Moon [#1155]

New observations of Mercury and lunar locations were collected near-simultaneously. A Mercury spectrum (400–970 nm) calibrated to standard geometry was constructed. This spectrum permits analysis with abundance relations for Fe and Ti.

Noble S. K. * Pieters C. M. Keller L. P.

The Optical Properties of Nanophase Iron: Investigation of a Space Weathering Analog [#1172]

We have created a space weathering analog by impregnating silica gel powders with nanophase iron to investigate the optical properties. We find that the Vis/NIR spectra change systematically with the size and concentration of iron.

Basu A. * McKay D. S. Wentworth S. J.

A Critical Examination of Relative Concentrations of Volume-correlated and Surface-correlated Submicron Globules of Pure Fe⁰ in Lunar Soils [#1159]

In lunar soils most of nanophase iron currently resides in agglutinitic glass.

Kareev M. S. * Sears D. W. G. Benoit P. H. Atabaev B. G.

The Importance of Solar Wind in the Production of "Space Weathering" Features on the Moon and on Asteroids [#1110]

Results support the idea that layered inclusions of npFe in the rims of regolith grains could be created or transformed by solar wind irradiation and charging, and thereby provides new insights on exposure by solar wind of the surface of asteroids.

Hendrix A. R. * Vilas F.

Space Weathering: An Ultraviolet Indicator [#1856]

We present spectra of lunar samples, the Moon, Vesta and other asteroids, which are used as evidence suggesting that the spectral slope of airless bodies in the UV-visible wavelength range can be used as an indicator of exposure to space weathering.

Anand M. * Taylor L. A. Nazarov M. A. Shu J. Mao H-K. Hemley R. J.

New Lunar Mineral HAPKEITE: Product of Impact-Induced Vapor-Phase Deposition in the Regolith?* [#1818]

We report here the results of *in situ* single-crystal study of a new lunar mineral phase, Hapkeite, and discuss its possible origin on the Moon and its significance for the overall process of space weathering.

Delaney J. S. * Dyar M. D. Hörz F. Johnson J.

Evidence for Coordination and Redox Changes of Iron in Shocked Feldspar from Synchrotron MicroXANES [#1417]

Synchrotron microXANES measurements of trace Fe in experimentally shocked feldspar reveal systematic changes of both oxidation state and coordination as a function of maximum shock pressure.

Dikov Yu. P. Gerasimov M. V. * Yakovlev O. I. Wlotzka F. Huth J.

The Behavior of Ni in Silicate Melts During Impact-Simulated High-Temperature Heating [#1574]

Impact-related heating produces condensates depleted in Mg and Si but highly enriched in Ni which is present as: metallic; oxide; and silicate type. The behavior of Ni agrees with the observed Ni budget of lunar regolith fine fraction and impact glasses.

Wilcox B. B. * Robinson M. S. Lucey P. G. Thomas P. C. Hawke B. R.

Constraints on the Depth and Variability of the Lunar Regolith [#1877]

We find that the depth of the regolith in mare regions is highly variable and commonly up to 25 m.