Tuesday, March 14, 2000
NEW VIEWS OF THE MOON: THERMAL EVOLUTION AND THE NATURE OF THE LUNAR INTERIOR II
1:30 p.m. Room A

Chairs: D. T. Blewett
E. M. Parmentier

Pritchard M. E. * Stevenson D. J.
The Thermochemical History of the Moon: Constraints and Major Questions **[#1878]**
We review the thermal history models of the Moon, observations that should be used to constrain these models, and themes to be explored in future work. We emphasize the importance of chemistry in thermal models.

Hess P. C. * Parmentier E. M.
Thermal Evolution of the Moon with a Thicker KREEP Layer **[#1659]**
We examine the role of a thicken KREEP layer segregated below the crust in the Imbrium region. Such a layer increases in volume and exists for more than 1 Gyr is inconsistent with mascons and the eruption of mare basalts.

Williams J. G. Boggs D. H. Ratcliff J. T. * Yoder C. F. Dickey J. O.
Lunar Power Dissipated by Tides and Core-Mantle Interaction **[#2018]**
Analysis of Lunar Laser Ranges gives information on lunar tidal dissipation and a molten core. For the ancient moon tidal heating of the interior and heating at the core-mantle boundary could have rivaled radiogenic heating.

Shearer C. K. * Papike J. J.
Compositional Dichotomy of the Mg Suite. Origin and Implications for the Thermal and Compositional Structure of the Lunar Mantle **[#1405]**
The lunar Mg suite contains rocks with contrasting primitive and evolved magmatic chemical signatures. Trace element studies of minerals in this suite of rocks, indicate both compatible (Ni,Co) and incompatible (REE) trace elements are decoupled from the high Mg number.

Schmitt H. H. *
Contrary Views on the Origin and Thermal Evolution of the Moon **[#1691]**
Likely explanations for lunar origin and thermal evolution appear to be (1) post-accretion capture and (2) large impact initiated concentration of KREEP components initially contained in a globally homogeneous zone at the base of the crust.

Wieczorek M. A. * Zuber M. T. Phillips R. J.
The Control of Magma Buoyancy on the Eruption of Mare Basalts **[#1520]**
We show that crustal thickness is not the sole factor that controls the eruption of mare basalts. Instead, we postulate that magma buoyancy predominantly determines whether or not mare basalts erupt at the surface or form intrusions within the crust.

Neal C. R. * Ely J. C. Jain J. C.
The PGE Budget of the Moon: Heterogeneity in the Mare Basalt Source Region **[#1961]**
New PGE data from low- and high-Ti basalts indicate PGE heterogeneity in the mare basalt source and possibly a significant role for metal in the crystallization of the magma ocean.

Jolliff B. L. * Gillis J. J. Haskin L. A.
Thorium Mass Balance for the Moon from Lunar Prospector and Sample Data: Implications for Thermal Evolution **[#1763]**
A global lunar mass-balance model for Th based on Lunar Prospector gamma-ray and lunar sample data is presented within the context of major crustal terranes. The consequences of strong enrichment of Th in the Procellarum KREEP Terrane are discussed.

Warren P. H. *
Bulk Composition of the Moon as Constrained by Lunar Prospector Th Data, I. Application of Ground Truth for Calibration **[#1756]**
The new gamma-ray spectrometry data set for Th shows an excellent correlation with sample-derived ground truth, but this trend does not pass through 0. Recalibration has a significant effect on the implied global mean surface Th concentration.

Haskin L. A. * Gillis J. J. Korotev R. L. Jolliff B. L.
The Nature of Mare Basalts in the Procellarum KREEP Terrane **[#1661]**
Unlike Apollo 12 and 15 basalts, many mare lavas of the Procellarum KREEP Terrane (PKT) have Th concentrations of 2.5-6 ppm and perhaps greater, as well as high TiO_2. Lunar "picritic" volcanic glasses from the PKT have a similar range.

Hiesinger H. * Head J. W. III Wolf U. Neukum G.
Lunar Mare Basalts in Oceanus Procellarum: Initial Results on Age and Composition **[#1278]**
We present new crater size-frequency distribution data for spectrally defined basalt units in Oceanus Procellarum. In addition, we report on the geochemical evolution, i.e. the variation of the titanium content of the basalts in Oceanus Procellarum in space and time.

Gillis J. J. * Jolliff B. L. Spudis P. D. Haskin L. A.
The Distribution of Mare Source Regions: Evidence Using Remotely Sensed Data **[#2089]**
An assessment of the volume, composition, and duration of mare volcanism using remotely sensed data and how these factors are controlled by the distribution of heat producing elements.

Schultz P. H. * Staid M. Pieters C. M.
Recent Lunar Activity: Evidence and Implications **[#1919]**
Impact processes gradually destroy topographic, photometric and spectral contrasts through time. Here we provide observational evidence for extremely well-preserved endogenic features that perhaps are best explained by gas release as recent as the last 1 Ma.