Thursday, March 10, 2011
POSTER SESSION II: LUNAR IMPACTS: TIMING, MORPHOLOGY, AND TECTONICS
6:00 p.m. Town Center Exhibit Area

Potter R. W. K. Donohue P. H. Gallegos Z. E. Hammond N. P. Kring D. A.
Multi-Ring Basins: Where and How to Best Determine Their Structure **[#1445]**
From a total of 53 lunar basins, those best suited for determining multiring basin structure were identified based on age, certainty, and number of rings.

Wood C. A. Collins M. J. S.
New Light on Old Basins **[#1314]**
Great resolution and homogeneity of LRO WAC mosaics and LOLA altimetry suggest that Moscoviense sits in an older basin, explaining its thin crust and mare lavas, Orientale and SPA overlap older basins, and Wilhelms and McCauley were right about Imbrium.

Kalynn J. Johnson C. L. Osinski G. R. Barnouin O.
Topographic Characterization of Complex Lunar Craters with LOLA Data **[#1514]**
We characterize the topography of fresh lunar craters in the diameter range 15–110 km using LOLA data.

Byrne C. J.
Absolute Zircon Ages for Pre-Nectarian Events and a Proposed Age for the Near Side Megabasin **[#1518]**
The pattern of zircon ages from samples from two different Apollo landing sites is used to infer ages for pre-Nectarian basins, including the nearside megabasin. This is of interest to the study impacts, mineralogy, and pre-Nectarian history.

Sori M. M. Zuber M. T.
Investigation of the Relationship Between Subsurface Structure and Crater Morphology of Lunar Impact Craters from Lunar Orbiter Laser Altimeter (LOLA) Observations **[#2694]**
We use LOLA data to compute depth-to-diameter ratios of large lunar impact structures (>60 km in diameter) in both the SP-A basin and the lunar highlands in order to investigate how subsurface structure affects crater morphology.

Aldridge T. M. Thomson B. J. Stoddard P. R. Cahill J. T. S. Bussey D. B. J. Mini-RF Science Team
A Mini-RF Radar Analysis of the Moon's South Pole-Aitken Basin **[#1883]**
Using Mini-RF S-band zoom we derive the Stokes (S1), and circular polarization ratio (CPR) parameters of the South Pole-Aitken basin. From global Clementine UVVIS-NIR data, we derive estimated TiO_2 and FeO maps for comparison with radar data products.

Sasaki S. Ishihara Y. Goossens S. Matsumoto K. Araki H. Hanada H. Kikuchi F. Noda H. Iwata T. Ohtake M.
Lunar South Pole-Aitken Basin from Kaguya (SELENE) Gravity/Topography **[#1893]**
We use gravity/topography by Kaguya to study the structure of South Pole-Aitken basin (SPA). The region with thinner crust is offset from SPA center. This implies the oblique impact origin of SPA. Small impact basins in SPA are also analyzed.

Gibson K. E. Jolliff B. L.
Correlation of Surface Units and FeO Concentrations in the South Pole-Aitken Basin Interior **[#2326]**
We used Clementine UV-VIS data and LP-GRS data in order to examine if a correlation exists between FeO concentrations in the mapped mare, cryptomare, and nonmare units surrounding Bose and Bhabha craters in the South Pole-Aitken Basin interior.

Jolliff B. L. Gibson K. E. Scholten F.
South Pole-Aitken Basin Interior: Topographic Expression of Mare, Cryptomare, and Nonmare Plains Units **[#2774]**
We use LRO Camera images and digital topographic models, derived from LROC images, to distinguish mare, cryptomare, and nonmare plains units in the deep interior of South Pole-Aitken Basin and to assess the thickness of nonmare ejecta deposits.

Ishihara Y. Morota T. Nakamura R. Goossens S. Sasaki S.
Was the Moscoviense Basin Formed by Double-Impact? **[#1124]**
We measured and considered surface and subsurface structure of the Moscoviense basin based on Kaguya selenodetic data. We propose a new hypothesis called “double-impact formation” of the Moscoviense basin.

Thaisen K. G. Taylor L. A. Head J. W. III Pieters C. M. Isaacson P. J. Nettles J. Kramer G. Y. Petro N. E.
The Moscoviense Basin: Insights into an Atypical Basin **[#2574]**
We explore the unusual ring configuration of the Moscoviense Basin as well as reexamine the mare units on the basin floor.

Andrews-Hanna J. C. Stewart S. T.
The Crustal Structure of Orientale and Implications for Basin Formation **[#2194]**
High-resolution crustal structure models of the Orientale Basin, CTH numerical simulations of the basin forming impacts, and flexural models are used to investigate the basin forming process and the origin of super-isostatic mantle uplifts.

Nahm A. L. Kring D. A.
Evidence of Normal Faulting of the Outer Rings of Orientale Basin: Preliminary Modeling Results **[#1172]**
Forward mechanical modeling results indicate that the eastern Cordillera and Outer Rook rings of the lunar Orientale Basin formed by normal faulting.

Fassett C. I. Head J. W. Smith D. E. Zuber M. T. Neumann G. A.
New Estimates of the Thickness Decay of Proximal Ejecta from the Orientale Basin Using the Lunar Orbiter Laser Altimeter (LOLA) **[#1395]**
The 930-km Orientale impact basin is the youngest basin of its size on the Moon, and its ejecta deposit modified a broad region. We present new observations of the thickness of the Orientale ejecta deposit on the basis of topographic data from LOLA.

Ambrose W. A.
Distribution and Chronostratigraphy of Ejecta Complexes in the Humorum Basin Mapped from LROC and Lidar Data **[#1035]**
LROC data reveal a population of small-scale ejecta features (asymmetric secondary craters, scours, and crater chains) in the Humorum Basin. These features are used to refine chronostratigraphic ages of landforms in the basin and basin margin.

Wilson L. Head J. W.
Impact Melt Sheets in Lunar Basins: Estimating Thickness from Cooling Behavior **[#1345]**
We use morphologic constraints and theoretical modelling to estimate the thickness of the impact melt sheet in the Orientale basin.

Morota T. Haruyama J. Ohtake M. Matsunaga T. Yamamoto S. Ishihara Y. Honda C. Kobayashi S. Yokota Y. Furumoto M. Takeda H.
Ejecta Thickness of Lunar Impact Basin **[#1301]**
In this study, we performed new crater size-frequency measurements for impact basins on the northern farside of the Moon to place constraints on the ejecta thickness models for impact basins using image data obtained by the SELENE Terrain Camera.

Ashley J. W. DiCarlo N. Enns A. C. Hawke B. R. Hiesinger H. Robinson M. S. Sato H. Speyerer E. J. van der Bogert C. H. Wagner R. V. Young K. E. LROC Science Team
Geologic Mapping of the King Crater Region with an Emphasis on Melt Pond Anatomy — Evidence for Subsurface Drainage on the Moon **[#2437]**
King Crater's melt pond exhibits a variety of details at the 0.5-m scale, including evidence for infiltration of melt. Crater-counting statistics show melt surfaces as less suitable for age dating than ejecta blankets. King Crater may be ~ 1 Ga old.

Zanetti M. Hiesinger H. van der Bogert C. H. Reiss D. Jolliff B. L.
Aristarchus Crater: Mapping of Impact Melt and Absolute Age Determination **[#2330]**
We report on progress made mapping Aristarchus Crater using high-resolution LROC NAC images. Observations include enigmatic impact melt features and stratified blocks of ejecta. An absolute model age using crater counts was also determined.

Öhman T. Kring D. A.
Photogeologic Analysis of Impact Melt-Rich Lithologies in the Lunar Crater Kepler Using LROC and Kaguya Data **[#1177]**
LROC NAC and Kaguya images reveal several different modes of occurrence of impact melt-rich lithologies within and around lunar crater Kepler. Mapping shows asymmetric distribution of melt-rich smooth and hummocky floor units and exterior melt ponds.

Mazarico E. Barnouin O. S. Salamunićcar G. Zuber M. T.
Impact Melt Volume Estimates of Small- to Medium-Sized Lunar Craters from Lunar Reconnaissance Orbiter Data **[#2075]**
We use a recent lunar crater catalogue to facilitate the use of LROC and LOLA data to survey and estimate impact melt volumes in small- to medium-sized craters.

Hawke B. R. Giguere T. A. Lawrence S. Bray V. Denevi B. W. Garry B. Gaddis L. Kestay L. Robinson M. LROC Science Team
A Tale of Two Craters: Impact Melt at Two Very Small Craters on the Moon **[#2347]**
We have used LROC NAC images to investigate the distribution, modes of occurrence, and volumes of the interior and exterior melt deposits associated with two very small (~3 km) and extremely young impact craters.

Neish C. D. Carter L. Bussey D. B. J. Cahill J. Thomson B. Barnouin O.
Correlation Between Surface Roughness and Slope on a Lunar Impact Melt **[#1881]**
Tycho impact melts / Change from rough to smooth downhill / A'a to smooth pond?

Garvin J. B. Robinson M. S. Frawley J. Tran T. Mazarico E. Neumann G.
Linne: Simple Lunar Mare Crater Geometry from LRO Observations **[#2063]**
Geometric properties of the lunar mare crater Linne have been established by means of high-resolution topographic data from LRO's LROC and LOLA instruments. Linne can be used as the basis for understanding simple craters on the planets.

Xiao Z. Strom R. G.
Problem in Crater Counting by Small Craters — Peeking at the Geologic History of Crater Alphonsus **[#2319]**
We prove that it is not plausible to date surface age by counting small craters.

Ostrach L. R. Robinson M. S. Denevi B. W. Thomas P. C.
Effects of Incidence Angle on Crater Counting Observations **[#1202]**
Using Apollo Metric and LROC NAC images, we determined that incidence angle affects reliable identification of (small) craters on a mare surface. This finding is consistent with Young [1975] and Wilcox et al. [2005] and requires additional study.

Fritz J.
A 8.2 Ma Age for the Lunar Crater Giordano Bruno? **[#1197]**
Giordano Bruno (22 km diameter) is the youngest lunar crater of its size. Its formation age is discussed by using lit. data on (1) crater statistics, (2) ejection ages and petrography of lunar meteorites, and (3) ^{3}He profiles of Earth's sediments.

Moss N. G. Harper T. M. Motta M. B. Epps A.
New Lunar Crater Search Using LROC-NAC vs LOIRP Lunar Orbiter Images **[#1597]**
This paper describes an effort by students at the Lunar Orbiter Image Recovery (LOIRP) project to visually compare LOIRP images from Lunar Orbiter II with recent images from Lunar Reconnaissance Orbiter's Narrow Angle Camera (NAC).

Zellner N. E. B. Gombosi D.
How Significant are the Recent Lunar Impact Events? **[#2109]**
We describe the nature of the reported increase in lunar impact flux over the last ~500 Ma.

Bell S. W. Thomson B. J. Dyar M. D. Bussey D. B. J.
Dating Fresh Lunar Craters with Mini-RF **[#1342]**
Using SAR imagery from Mini-RF on LRO, we have developed a method for dating small fresh lunar impact craters from the radar-bright halos around the craters. These halos represent the ejecta lingering on the lunar surface and degrading over time.

Bouley S. Baratoux D.
Variation of Small Crater Degradation on the Moon **[#1388]**
With the release of LRO data it is now possible to study the morphology of small craters and to observe the diversity of degradation features. This study has as its main goal the exploration of the evolution of crater degradation with time on the Moon.

Banks M. E. Watters T. R. Robinson M. S. Bell J. F. III Pritchard M. E. Williams N. R. Daud K. the LROC Team
The Search for Lunar Lobate Scarps Using Images from the Lunar Reconnaissance Orbiter Camera **[#2736]**
A search for previously undetected lobate scarps was conducted using images from the Lunar Reconnaissance Orbiter Camera. To date, previously undetected lobate scarps have been identified in LROC images and mosaics in 73 different locations.

Banks M. E. Watters T. R. Robinson M. R. Tornabene L. L. the LROC Team
Morphological Analysis of Lunar Lobate Scarps Using LROC NAC and LOLA Data: Preliminary Results **[#2779]**
LROC stereo-derived digital terrain models and LOLA data are used to measure the relief of 23 lunar lobate scarps. The relief of the lobate scarps ranges from ~4 to 130 m with a mean relief of ~25 m.

Watters T. R. Robinson M. S. Banks M. E. Tran T. LROC Team
Evidence of Young Extensional Faulting on the Moon **[#2022]**
Previously undetected small-scale graben have been revealed in images obtained by the Lunar Reconnaissance Orbiter Camera. These small-scale graben are <1 billion years old and join the lobate scarps as the youngest tectonic landforms on the Moon.