Oshigami S.  Yamaguchi Y.  Okuno S.  Ono T.  Ohtake M.
Subsurface Structure of Mare Serenitatis Observed with Lunar Radar Sounder and Multiband Imager Onboard Kaguya [%1576]
Radar reflectors are detected under a large area of Mare Serenitatis. Meanwhile, layered structures are discernible on some crater walls in mineral content maps of the mare. We discuss characteristics of the subsurface layers by comparing these data.

Shankar B.  Osinski G.  Antonenko I.  Stooke P. J.  Mest S.
Multispectral Study of the Schrödinger Impact Basin [%2542]
A multispectral study using Clementine UV-VIS data to determine the compositions of mapped geologic units within the Schrödinger Impact Basin.

Arnold J. A.  Glotch T. D.  Bandfield J. L.  Greenhagen B. T.  Lucey P. G.  Wyatt M.  Paige D.
Local-Scale Spectral Variability of the South Pole-Aitken Basin [%2023]
Preliminary results of mapping mafic materials within the SPA basin using data from the Diviner Lunar Radiometer Experiment.

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Dickson J. L.  Head J. W. III  Smith D. E.  Zuber M. T.  Neumann G.  Fassett C.  LOLA Team
Lunar Orbiting Laser Altimeter (LOLA) data have provided new insight into Orientale and the nature of multi-ring impact basin formation, the role of pre-existing topography, processes of ring formation, and the evolution of the inner depression.

Clark R.  Nettles J.  Whitten J.  M3 Team
Morphology and Distribution of Volcanic Vents in the Orientale Basin from Chandrayaan-1 Moon Mineralogy Mapper (M3) Data [%1032]
Moon Mineralogy Mapper (M3) data have provided new insight into the distribution, morphology and morphometry of volcanic vents, such as sinuous rilles, in the Orientale basin and their relationship to ring structures and basin thermal evolution.

Whitten J.  Head J.  Staid M.  Pieters C.  Mustard J.  Taylor L.  McCord T.  Isaacson P.  Klima R.
Nettles J.  M3 Team
Characteristics, Affinities and Ages of Volcanic Deposits Associated with the Orientale Basin from Chandrayaan-1 Moon Mineralogy Mapper (M3) Data: Mare Stratigraphy [%1841]
Orientale basin contains many volcanic deposits, including Mare Orientale, Lacus Veris, and Lacus Autumni have been redated using statistical crater counting techniques. Several new mare ponds have been identified in the western part of the basin.

Garry W. B.  Robinson M. S.  LROC Team
Observations of Flow Lobes in the Phase I Lavas, Mare Imbrium, the Moon [%2278]
The Phase I lavas in Mare Imbrium on the Moon have previously been defined only by albedo and color boundaries on the surface. We present LROC NAC images of flow lobes in the Phase I lavas and implications for emplacement parameters.
Xiao Z. Zeng Z. Ding N. Hu C.
*Origin of Pit Chains in the Floor of Lunar Copernican Craters — Example of Crater Copernicus, Aristarchus and Tycho.* [#1034]
The inner crater floor pit chains in lunar Copernican craters are originated from the activity of faults while there are two possible formation mechanism of the round crater floor pit chains.

Xiao Z. Zeng Z. Xiao L.
*Origin of Polygons in the Crater Floor of Tycho* [#1526]
Polygons in the floor of crater Tycho are originated from the uplift of subsurface magma while the source of the magma is still undetermined.

Korteniemi J. Eldridge D. L. Lough T. Werblin L. Singer K. Kring D.
*Assessment of Lunar Volcanic Morphological Diversity: Distribution of Floor-fractured Craters* [#1335]
A survey of floor-fractured craters on the Moon from global data. They are locations where a multitude of volcanic deposits can be sampled, and they should thus be taken into account when considering landing sites for future missions.

Srisutthiyakorn N. Kiefer W. S. Kirchoff M.
*Spatial Distribution of Volcanos in the Marius Hills and Comparison with Volcanic Fields on Earth and Venus* [#1185]
The spatial concentration of volcanos in the Marius Hills on the Moon is comparable to the concentration in the Snake River Plains of Idaho and for a number of volcanic dome fields on Venus.

Gustafson J. O. Bell J. F. III Gaddis L. R. Hawke B. R. Robinson M. S. LROC Science Team
*Analysis of Pyroclastic Deposits on the Southeastern Limb of the Moon Using LROC and Clementine Spectral Reflectance Data* [#1862]
LROC NAC, LROC WAC, and Clementine data are being used to study potential pyroclastic deposits. NAC and WAC data are used to examine morphology and confirm pyroclastic origin. WAC and Clementine data are used to constrain composition.

*LROC and Other Remote Sensing Studies of Pyroclastic Deposits in the Mare Humorum Region* [#1583]
The two large regional pyroclastic deposits are dominated by pyroclastic glasses. LROC NAC images show that the thickest portion of the SWH deposit is dark, flat, smooth, and deficient in blocks >1m across.

Lough T. Gregg T. K. P.
*Geologic Mapping of the Aristarchus Plateau Region on the Moon* [#2370]
We present preliminary mapping of a 13° × 10° area around Aristarchus plateau, located in Lunar Quadrangle 10, with the goal of inferring changes in magma properties and volcanic plumbing through detailed mapping of surficial deposits.

*Mare Volcanism on the Farside and in the Orientale Region of the Moon* [#1309]
Dating of lunar mare basalts is necessary for understanding the volcanic history of the Moon. Here we performed new crater counts in mare deposits on the farside and in the Orientale region, using new images obtained by SELENE Terrain Camera.

Payne C. J. Spudis P. D. Bussey B. Thomson B. J.
*Scattering Properties of Lunar Geological Units Revealed by the Mini-SAR Imaging Radar, Chandrayaan-1 Mission* [#1211]
We have collected data from Mini-SAR orbital radar on the surface scattering properties of several lunar geological units of varying age and origin with the aim of understanding the physical properties of the surface of the Moon.
Geologic mapping of impact crater floor deposits in the lunar South Pole quadrangle (LQ-30) is revealing (1) smooth, dark deposits interpreted to be mare, and (2) brighter, densely cratered deposits consisting of impact melt and/or mantled mare.


Byrgius A Crater Impact Melts — An LROC Perspective

LROC NAC images were used to investigate the origin, distribution, and modes of occurrence of impact melt at the lunar crater Byrgius A.

Denevi B. W. Robinson M. S. Lawrence S. J. Keszthelyi L. P. Hawke B. R. Garry W. B. Bray V. Tornabene L. L. LROC Team

Physical Constraints on Impact Melt Properties from LROC NAC Images

A range of well-preserved impact melt flows observed on the outside of crater rims are studied in order to elucidate the physical properties of lunar impact melts.

Plescia J. B. Bussey D. B. J. Robinson M. S. Paige D. A.

King Crater – Surface Properties Derived from Diviner, Mini-RF, and LROC Data

King Crater displays anomalous thermal and radar properties. High resolution LROC images show these are associated with boulders and bedrock outcrops. This example illustrates how LRO data can be used to understand geologic details of a site.


Using Mini-RF to Investigate the Anomalous UVVIS Spectrum in the Apollo and Plato Region

Mini-RF radar data are used to examine the chemical and physical properties of both Apollo and Plato regions.


Earth-Based S-Band Radar Mapping of the Moon: New Views of Impact Melt Distribution and Mare Physical Properties

We present results at the halfway point of a campaign to map much of the Moon’s near side using the 12.6-cm radar transmitter at Arecibo Observatory and receivers at the Green Bank Telescope.


Roughness and Radar Polarimetry of Lunar Polar Craters: Testing for Ice Deposits

Results from the Mini-SAR radar instrument on Chandrayaan-1 indicate certain north polar craters on the Moon have polarization signatures consistent with ice. Roughness effects alone appear insufficient to explain the observations.


The Geomorphology of the Lunar Surface as Seen by the Mini-RF Instrument on LRO

Here we describe some of the unique capabilities of the Mini-RF radar instrument on LRO with regard to analyzing the geomorphology of the lunar surface.

Lawrence S. J. Mechtley M. Spudis P. Bussey B. Robinson M. S.

Coordinated Mini-RF and LROC Observations of the Lunar Surface

We report on coordinated Mini-RF radar and LROC Narrow Angle Camera observations of the lunar surface.

**Depth-Diameter Ratios of Small Craters from LOLA Multi-Beam Laser Altimeter Data** [#2443]

We characterize small craters using the unique cross-track topographic information of the LOLA data. We estimate the best-fit shape and the depth-to-diameter ratio, which inform us on formation processes and (shallower) secondary crater population.

Wells K. S., Bell J. F. III

*Characterization of Ejecta Facies of a Small Lunar Crater in Balmer Basin Using LROC Data* [#1932]

Using a 0.93 m/pix Lunar Reconnaissance Orbiter Camera (LROC) Narrow Angle Camera (NAC) image, we investigate the distribution of impact ejecta of a small (D ~ 1 km) unnamed lunar primary crater located in Balmer Basin (−18.6°, 69.1°).

Sori M. M., Zuber M. T.

**Preliminary Measurement of Depth-to-Diameter Ratios of Lunar Craters in the Transition Regime Between Complex Craters and Multiringed Basins** [#2202]

Impact craters on the Moon follow a size-morphology sequence. This study looks at those impact structures in the transition regime between complex craters and multiringed basins. The ratios of those structures’ depth to diameter are measured.


*Lunar Surface Roughness and Slope Statistics from LOLA* [#2502]

The RMS slope and Hurst exponent over horizontal scales of ~56 meters to ~2.7 kilometers are calculated from LOLA altimetry measurements and used to quantitatively characterize the roughness properties of the lunar surface.

Barnouin O. S., Smith D., Zuber M., Robinson M., Neumann G., Mazarico E., Denevi B., Duxbury T., Turtle E., LOLA Team, LROC Team

**The Topographic Shape and Surface Roughness of a few Lunar Craters** [#1479]

Topographic data measured from the Lunar Orbiter Laser Altimetry (LOLA) and the Lunar Reconnaissance Orbiter Camera (LROC) are used to assess the relationship between observed surface features and their topographic expressions within a few lunar craters.

Hiesinger H., van der Bogert C. H., Pasckert J. H., Robinson M. S., Klemm K., Reiss D., LROC Team

**New Crater Size-Frequency Distribution Measurements for Copernicus Crater Based on Lunar Reconnaissance Orbiter Camera Images** [#2304]

We have performed new crater size-frequency distribution measurements for melt pools, the floor, and the ejecta blanket of Copernicus crater.

Marchi S., Bottke W. F.

**New Insights on the Cratering History of Lunar Farside** [#1314]

In order to achieve a better understanding of the early evolution of the Moon, we performed new crater counts on the oldest terrains on the lunar farside. Derived crater counts are here presented and analysed.

Morita S., Asada N., Demura H., Hirata N., Terazono J., Ogawa Y., Honda C., Kitazato K.

**Approach to Crater Chronology with Fourier Transform of Digital Terrain Model** [#1990]

We validated the effect of crater position, diameter and number using the transformed images and their average values. As a result, it showed fourier transform of DTM may be able to be used for geological age estimation instead of crater counting.


**What are Lunar Basins?** [#1712]

Lunar basins have been characterized as circular craters > 300 km with no central peak defined by tectonic and volcanic features. LRO/LOLA observations allow re-examination and perhaps removal of some uncertain pre-Nectarian basins, and addition of others.
Ishihara Y. Morota T. Iwata T. Matsumoto K. Goossens S. Sasaki S.
*Lunar Large Impact Basin Structures and Implications for Thermal History* [#1559]
We reconstruct excavate cavity geometry of large impact basins on the Moon (including farside basins) using the Kaguya crustal thickness model. We discuss the impact structures and thermal history.

Ambrose W. A.
*Origin, Distribution and Chronostratigraphy of Asymmetric Secondary Craters and Ejecta Complexes in the Crisium Basin* [#1061]
Asymmetric secondary craters in the Crisium Basin, differentiated from morphologically similar primary craters, constrain estimated ages of landforms and are instrumental in refining stratigraphic relationships in the basin.

Gan F. P. Yu Y. M. Yan B. K.
*Primary Study of the Relationship Between the Lunar Surface Topography and Geological Informations* [#1303]
The distributions of elements and minerals of the lunar surface are retrieved using Clementine data, and DEM model is retrieved using LIDAR data of Chang’E-1 satellite. Finally, the relationship between the compositions and topography of the lunar surface is analyzed.