

Tuesday, July 25, 2017
ORIGIN AND EVOLUTION OF THE MOON
1:30 p.m. Sweeney B

*The origin and evolution of the Moon is discussed in
the light geochemical, isotopic and petrologic studies of lunar samples.*

Chairs: Katherine Joy
Timothy Fagan

- 1:30 p.m. Fegley B. Jr. * Lodders K.
[Chemical Constraints on Formation of the Moon](#) [#6227]
 Our chemical equilibrium calculations over a range of P–T conditions for formation of the Moon from a bulk silicate Earth (BSE) melt — vapor system constrain the conditions where lunar elemental ratios occur and where Ce depletions are absent.
- 1:45 p.m. Thiemens M. M. * Leitzke F. P. Sprung P. Fonseca R. O. C. Münker C.
[Early Differentiation of the Moon from Combined High Precision HFSE Measurements and Partitioning Experiments](#) [#6363]
 We analyzed a diverse and comprehensive suite of lunar samples for high-precision High Field Strength Element concentration data, and integrated it with the latest partition coefficients to accurately model lunar mantle melting.
- 2:00 p.m. Fagan T. J. * Nagaoka H.
[Northwest Africa 773 Clan Olivine Cumulate Gabbros: Crystallization Trends Compared with a Gabbroic Sill from Murotomisaki, Japan](#) [#6082]
 The Murotomisaki gabbroic sill evolved at an early stage by increasing Ti# at constant Fe#, similar to the trend observed in NWA 773 clan OC. Late stage pyroxenes in both magmatic systems have high Ti# and Fe#, but intermediate paths differ.
- 2:15 p.m. Treiman A. H. * Gross J. Kulis M. J. Glazner A. F.
[Lunar Spinel Anorthosites: Updated Constraints from Enthalpy](#) [#6226]
 Formation of spinel-bearing rocks near the Moon's surface requires boatloads of heat.
- 2:30 p.m. Schwarz W. H. Hopp J. Bartoschewitz R. Trieloff M. *
[U-Pb Dating of Zircons from the Lunar Meteorite Jiddat Al Harasis 838](#) [#6262]
 SIMS analyses yield U-Pb ages of ~4.33 Ga common for lunar zircons and ~4.44 Ga, among the oldest lunar zircon age data.
- 2:45 p.m. Xing W. F. * Hu S. Yang W. Zhang J. C. Hao J. L. Xiao L. Lin Y. T.
[MicroStructures and U-Pb Chronology of Zircons in the Regolithic Breccia of the Lunar Meteorite Sayh al Uhaymir 169](#) [#6377]
 We report results of *in situ* U-Pb isotopic analyses and microstructures of zircons in a KREEP-rich lunar meteorite.
- 3:00 p.m. Joy K. H. * Gradwell L. A. Pernet-Fisher J. F.
[Sampling Basin Ejecta in the Outer — Feldspathic Highlands Terrane at Luna 20](#) [#6269]
 Luna 20 returned samples from the Outer-Feldspathic Highlands Terrane. We have analysed Luna 20 grain mounts to understand the diversity of basin and crater ejecta contributions and the heterogeneity of the lunar feldspathic crust.

- 3:15 p.m. Korochantseva E. V. Buikin A. I. Verchovsky A. B. Hopp J. Korochantsev A. V.
Anand M. Trieloff M. *
[Noble Gas, N and C Stepwise Heating and Crushing Data for the Lunar Meteorite Dhofar 1436](#) [#6258]
Fractionated solar wind noble gases and their correlation with orphan argon extracted by stepwise crushing indicate impact induced redistribution.
- 3:30 p.m. Greer J. * Rout S. S. Isheim D. Seidman D. N. Wieler R. Heck P. R.
[Atom Probe Tomography of Lunar Regolith Ilmenite Grain Surfaces](#) [#6137]
Here we demonstrate the use of atom probe tomography to characterize products of space weathering in Apollo 17 ilmenite soil samples. We find nanophase Fe particles, zoning, and vesicles that presumably once held noble gases from solar wind.
- 3:45 p.m. Tartèse R. * Lyon I. C.
[A TOF-SIMS Investigation of the Volatile Inventory of Lithic and Mineral Clasts in Lunar Regolith Samples](#) [#6241]
The lunar regolith offers a key record to characterise the transfer of volatiles across the solar system for the past 4.5 billion years. We tackle this issue by investigating the volatile inventory of lunar regolith samples using TOF-SIMS.