Wednesday, February 4, 2015

CHRONOLOGY OF IMPACTS
1:15 p.m.  Lecture Hall

Discussions on the ages of early solar system impact events

Chairs:  Timothy Swindle  
           Richard Walker

1:15 p.m. Swindle T. D. *   Kring D. A.

*Was There a Concentration of Lunar and Asteroidal Impacts at ~4000 Ma? [#3030]*

Although the extreme version of a “lunar cataclysm” envisioned by G. Ryder is clearly not accurate, geochronological evidence from both the Moon and meteorites suggests that there was an increase in the number of impact resetting events at ~4000 Ma.

1:35 p.m. Norman M. D. *

*The Nature of the 4.2 Ga Impact Episode on the Moon:  Evidence from North Ray Crater Breccias, Apollo 16 [#3014]*

The range of Ar ages obtained from clasts in the North Ray breccias may reflect variable resetting of ejecta from a 4.2 Ga basin that occurred in the PKT and was subsequently transported to the Apollo 16 site by Imbrium deposits.

1:55 p.m. Cohen B. A. HRH *   Petro N. E. Esq.   Lawrence S. J. Hon.

*What do Nectaris Basin Impact Melt Rocks Look Like and Where can We find Them? [#3019]*

We are revisiting the effort to identify Nectaris basin impact-melt rocks at the Apollo 16 site, to model their emplacement, and to examine other sites where Nectaris impact melt is more abundant and/or more recognizable for potential further study.

2:15 p.m. Hurwitz D. *   Kring D. A.

*Identifying the Geologic Context of Apollo 17 Aphanitic and Poikilitic Impact Melt Breccias [#3037]*

High resolution image and topography data are used to identify sources of Apollo 17 aphanitic and poikilitic impact melt breccias. Observations indicate both sample classes originated in massif outcrops that were not contaminated by younger material.

2:35 p.m. Zellner N. E. B. *   Delano J. W.

*Relationships Among Chemical Composition, Size, and Shape when Evaluating 40Ar/39Ar Ages of Lunar Impact Glasses [#3018]*

Studies of size, shape, chemical composition and 40Ar/39Ar age suggest that feldspathic lunar impact glasses are not likely to provide much information about very old episodes of lunar bombardment.


*Lunar 40Ar/39Ar Step-Heating Data and the Late Heavy Bombardment [#3029]*

A thermochronologic interpretation of Apollo 40Ar/39Ar data suggests significant bias in existing “plateau” age based interpretations.

3:15 p.m. COFFEE BREAK

3:30 p.m. Crow C. A. *   McKeegan K. D.   Moser D. E.

*Lunar Zircons:  What’s the Big Picture? [#3020]*

An extensive U-Pb, REE, and microstructural survey of Apollo zircons from which we can draw constraints regarding the duration of KREEP magmatism, zircon formation mechanisms, and possibly the early impact history of the Moon.
3:50 p.m.  Wielicki M. M. *  Harrison T. M.

**Zircon Formation in Impact Melts: Complications for Deciphering Planetary Impact Histories** [#3024]

We explore the formation conditions and inheritance probability of zircon in impact melts and the implications of using zircon geochronology to investigate planetary impact histories.

4:10 p.m.  Moser D. E. *

**Zirconium Minerals from Mars, Moon and Earth Indicate Crustal ‘Refugia’ on Early Bombardment Surfaces** [#3038]

A comparison of the shock microstructural and U-Pb histories of zirconium minerals from the bombardment epoch of Mars, Moon and Earth points to perseverance of early planetary crustal domains throughout the large impactor flux.

4:30 p.m.  Marchi S. *  Bottke W. F.  Elkins-Tanton L. T.  Wuenneemann K.  Morbidelli A.  Kring D. A.

**The Bombardment of the Earth During the Hadean and Early Archean Eras** [#3008]

I will present a recent model of asteroid bombardment on the early Earth and discuss implication for the early habitability.

4:50 p.m.  Lowe D. R. *  Byerly G. R.

**The Terrestrial Record of an Extended Late Heavy Bombardment** [#3015]

Terrestrial ejecta layers 3.2–3.5 billion years old record the frequency and effects of large asteroid impacts during late Late Heavy Bombardment. They indicate that the Earth’s surface continued to be battered by large impacts as late as 3.2 Ga.


**Remnants of Early Archean Impact Events on Earth: New Studies on Spherule Layers from the Barberton Mountain Land, South Africa** [#3017]

New geochemical and isotopic data on the 3.4 Ga spherule layers from the Barberton Mountain Belt in South Africa help to constrain the early impact record on Earth.