

Friday, March 11, 2011

VESTA AND HED METEORITES: THE PRE-DAWN PERSPECTIVE

8:30 a.m. Waterway Ballroom 5

Chairs: David Mittlefehldt
Timothy McCoy

- 8:30 a.m. Delaney J. S. *
[*Stratigraphy of a Basaltic Planetoid — 4 Vesta and the HEDs* \[#2399\]](#)
Correlation of all lithic components in the HEDs can be used to produce a planetoidal stratigraphy for Vesta by examining both the chronological and the spatial relationships of lithic clasts to one another.
- 8:45 a.m. Ivanov B. A. Melosh H. J. * Pierazzo E.
[*The South Pole Impact Crater on Vesta: Numerical Modeling* \[#1717\]](#)
We present two-dimensional numerical modeling of the South Pole impact crater formation with self-gravity and the acoustic fluidization model. Our results are in favor of ~80 km projectile diameter.
- 9:00 a.m. Wittmann A. * Hiroi T. Ross D. K. Herrin J. S. Rumble D. III Kring D. A.
[*Eucrite Impact Melt NWA 5218 — Evidence for a Large Crater on Vesta* \[#1984\]](#)
NWA 5218 is a clast-rich eucrite impact melt rock, which may have resulted from an impact that affected the mid-to lower crust of Vesta; its reflectance spectra may be useful for DAWN to identify melt outcrops on Vesta.
- 9:15 a.m. Smith S. E. * Mayne R. G. Corrigan C. M.
[*Petrology and Mineralogy of Fine-Grained Eucrites as a Guide to Understanding the Petrogenesis of Vesta* \[#1268\]](#)
The differentiated asteroid Vesta offers us the opportunity to understand the processes of planetary formation using its associated meteorite group, the howardite-eucrite-diogenite (HED) suite. Two models of formation will be tested using quenched eucrite clasts within howardites.
- 9:30 a.m. Zhou Q. Yin Q.-Z. * Bottke B. Claeys P. Li X.-H. Wu F.-Y. Li Q.-L. Liu Y. Tang G.-Q.
[*Early Basaltic Volcanism and Late Heavy Bombardment on Vesta: U-Pb Ages of Small Zircons and Phosphates in Eucrites* \[#2575\]](#)
We report a new technique to determine U-Pb ages in very small zircons (<5 μm) and apatite in eucrites by the Cameca ims 1280 ion probe. The new apatite age for eucrites suggests late heavy bombardment may have started as early as 4.1 Ga.
- 9:45 a.m. Righter M. * Lapen T. J. Shaulis B.
[*U-Pb and \$^{207}\text{Pb}\$ - \$^{206}\text{Pb}\$ Ages of Zircons from Basaltic Eucrites.* \[#2740\]](#)
We analyzed U-Pb and ^{207}Pb - ^{206}Pb ages of zircons from three basaltic eucrites. The preliminary U-Pb and ^{207}Pb - ^{206}Pb ages of zircons are both 4546 ± 13 Ma, which is consistent with inferred formation age of eucrite basalt (4.56 Ga).
- 10:00 a.m. Mittlefehldt D. W. * Herrin J. S. Cartwright J. A.
[*The Regolith of 4 Vesta — Inferences from Howardites* \[#2569\]](#)
The vestan regolith, represented by howardites, is different in detail from lunar regolith breccias. Our petrologic and compositional studies on howardites will be discussed in the context of the differing surface environments of Vesta and the Moon.

- 10:15 a.m. Cartwright J. A. * Herrmann S. Herrin J. Mittlefehldt D. W. Ott U.
[*Noble Gas Analysis in the Quest to find "Regolithic" Howardites*](#) [#2655]
Noble gas analysis of howardites has been used to assess the regolithic nature of these meteorites, based on parameters suggested in previous work. This research will aid understanding of regolith formation processes on asteroids and other planetary bodies.
- 10:30 a.m. Johnson K. N. * Herrin J. S. Mittlefehldt D. W.
[*Investigation of Orthopyroxene Diversity in Howardite Meteorites*](#) [#2073]
Integration of laser ablation ICP-MS analysis of eight howardite samples with XRF data, EMPA data points, noble gas abundance results, and petrographic descriptions provides some preliminary interpretations of regolithic classification.
- 10:45 a.m. Boesenberg J. S. * Erb I. R.
[*Formation of Ti-Cr Fractionation Trends in Howardite Pyroxene*](#) [#1017]
Up to 6 different Ti/(Ti + Cr) vs. Fe/(Fe + Mg) trends have been determined in pyroxene from 8 of 11 howardites. These trends suggest that the eucritic and diogenitic clasts in howardites form during continuous, fractional crystallization sequences.
- 11:00 a.m. Herrin J. S. * Zolensky M. E. Cartwright J. A. Mittlefehldt D. W. Ross D. K.
[*Carbonaceous Chondrite-Rich Howardites; The Potential for Hydrous Lithologies on the HED Parent*](#) [#2806]
Recent chondrite-rich Antarctic howardite finds further document the contribution of CM chondrite impactors to the HED parent surface, and indicate that local concentrations of hydrous material may exist on the nominally anhydrous HED parent.
- 11:15 a.m. Beck A. W. * McSween H. Y. Jr. Bodnar R. J.
[*Further Evidence for Multiple Diogenite Lithologies: Trace Element Variations in Diamict Diogenites*](#) [#2259]
We investigate *in situ* trace element concentrations in five diogenites, proposed to contain two lithologies. Our results support this proposal, showing trace element trends that are best explained by the sampling of two lithologies, separated via fractionation.
- 11:30 a.m. Walker R. J. * Day J. M. D. Bottke W. F. Elkins-Tanton L. T. Nesvorny D. Irving A. J.
[*Abundances of Highly Siderophile Elements in Diogenites Compared with the Mantles of Earth, Mars and the Moon: Consistent with Stochastic Late Accretion?*](#) [#1386]
Abundances of highly siderophile elements (HSE) in the terrestrial, martian, and lunar mantles are consistent with stochastic late accretion. The large variance in HSE concentrations among diogenites appears consistent with this process.