Not Quite Keeping Up With The Lunar Meteorites – 2016. R. L. Korotev[1] and A. J. Irving[2], [1]Department of Earth & Planetary Sciences and McDonnell Center for the Space Sciences, Washington University, Saint Louis MO 63130; [2]Department of Earth & Space Sciences, University of Washington, Seattle, WA 98195; korotev@wustl.edu

Since our abstract of last year [1], 38 new lunar meteorite stones with a total mass of 37.87 kg have been reported in the Meteoritical Bulletin database [2] (names in bold below). One of the stones is from Antarctica, two are from Oman, and the remaining 35 are from northern Africa. We have obtained compositional data on multiple subsamples of 27 of the stones by INAA [3]. Unless otherwise noted, all of the new meteorites are fragmental, regolith, or glassy-matrix breccias.

Antarctica and Oman. Miller Range 13317 [A] has an unusually mafic, Sm-rich composition (Fig. 1) and is unpaired with any of the four other Miller Range lunar meteorites [3]. **Jiddat al Harasis 838** [B] is compositionally distinct from JaH 348 [4]. We have not yet analyzed our sample of **Dhofar 1769**, but sawn slices of the rock appear different from other Dhofar lunar meteorites.

Northwest Africa. On the basis of composition and texture, we suspect that **Northwest Africa 8733** [C], **NWA 8746 [**D], **NWA 10048** [E], and **NWA 10065** [F] are all paired with NWA 8673. These stones are moderately mafic and similar in composition to Omani stones Dhofar 925, Dhofar 960, and Sayh al Uhaymir 449 [4]. All have moderately high concentrations of siderophile elements (e.g.,17−26 ppb Ir).

NWA 8783 [G] and **NWA 10130** [H] are paired with NWA 8455, NWA 8609, and NWA 8668. Although we have not yet analyzed them, we suspect from photographs and the Meteoritical Bulletin descriptions that **NWA 10141** and **NWA 10142** are also part of the pair group. This group has a composition similar that of typical soils from Apollo 16 (Fig. 1; [1]).

NWA 10049 [I], **NWA 10077** [J], and **NWA 10133** [K] appear to be paired with NWA 8641 and NWA 8682. **NWA 10082** [L] is paired with NWA 8022. Both are granulitic breccias of feldspathic composition. **NWA 10149** [M], **NWA 10203** [N], and **NWA 10263** [O] are more stones of the mafic pair group that includes NWA 7834, NWA 7948, and NWA 8306.

NWA 10140 (not analyzed), **NWA 10178** [P], **NWA 10318** (not analyzed), and **NWA 10401** [Q] are paired with NWA 5744, NWA 8599, NWA 8651, and NWA 8687. This unique pair group is a granulitic breccia of anorthositic troctolite composition with very low concentrations of incompatible elements (Fig. 1; [5,6]). Basalt-rich **NWA 10272** [R] and **NWA 10291** [#] appear to be paired with NWA 7611 and NWA 8277, and probably launch paired with NWA 4884, Queen Alexandra Range 94281, Yamato 793274/981031, Elephant Moraine 87521/96008, and Mount Dewitt 12007. Together these stones may comprise the largest lunar launch-pair group [7–9].

Figure 2. A slice of NWA 10401, a granulitic breccia of anorthositic troctolite composition [6,11]. Many of the NWA 5744 clan stones have prominent veins of impact melt.

Of the 24 new NWA stones analyzed by INAA, eight are distinct from lower-numbered stones. **NWA 8727** [S] and **NWA 10228** [T] are clast poor impact-melt rocks. Compositionally, they are all but indistinguishable from the NWA 8455 pair group (fragmental breccias), with which they might also be paired, but the textures are distinctly different. **NWA 8753** [U] and **NWA 10073** [V] are typical feldspathic lunar meteorites but neither is evidently paired with numerous others. **NWA 10123** [W] is moderately mafic and poor in incompatible elements. **NWA 10309** [X] consists of several stones totaling 16.518 kg in mass, making it the most massive lunar meteorite so far. **NWA 10404** [Y] is a feldspathic breccia with a vitric and highly vesicular matrix. It contains glass shards of feldspathic composition and is the subject of a separate abstract [10]. Finally, **NWA 10447** [Z] is the most mafic (15% FeO) of the new meteorites, probably as a result of a substantial mare component.

Not yet analyzed: **NWA 10172, NWA 10253, NWA 10258, NWA 10317, NWA 10376, and NWA 10415**.

Acknowledgments: Thanks to ANSMET/NASA, A. Aaronson, C. Agee, M. Aid, S. Arnold, R. Bartoschewitz, A. Bouragaa, R. Chaoui, A. Debienne, S. Decker, M. Didi, G. Fujihara, D. Gregory, S. Haddany, J. Higgins, G. Hupé, A. Jonikas, M. Jost, J. Kettunen, F. Kuntz, M. Morgan, P. Pelé, S. Ralew, S. Vasiliev and, especially, D. Pitt for samples.

References: [1] Korotev R. L. and Irving A. J. (2015) LPSC46, #1942. [2] http://www.lpi.usra.edu/meteor/metbull.php. [3] Zeigler R. A. and Korotev R. L. (this conf.). [4] Korotev R. L. (2012) *M&PS* **47**, 1365–1402. [5] Kuehner S. M. et al. (2010) LPSC41, #1552. [6] Hilton E. et al. (this conf.). [7] Korotev R. L. et al. (2003) *Antarctic Meteorite Research* **16**, 152–175. [8] Korotev R. L. et al. (2009) *M&PS* **44**, 1287–1322. [9] Collareta A. et al. (in press) *M&PS.* [10] Kuehner et al. (this conf.). [11] Kuehner S. M. et al. (2010) LPSC41, #1552.

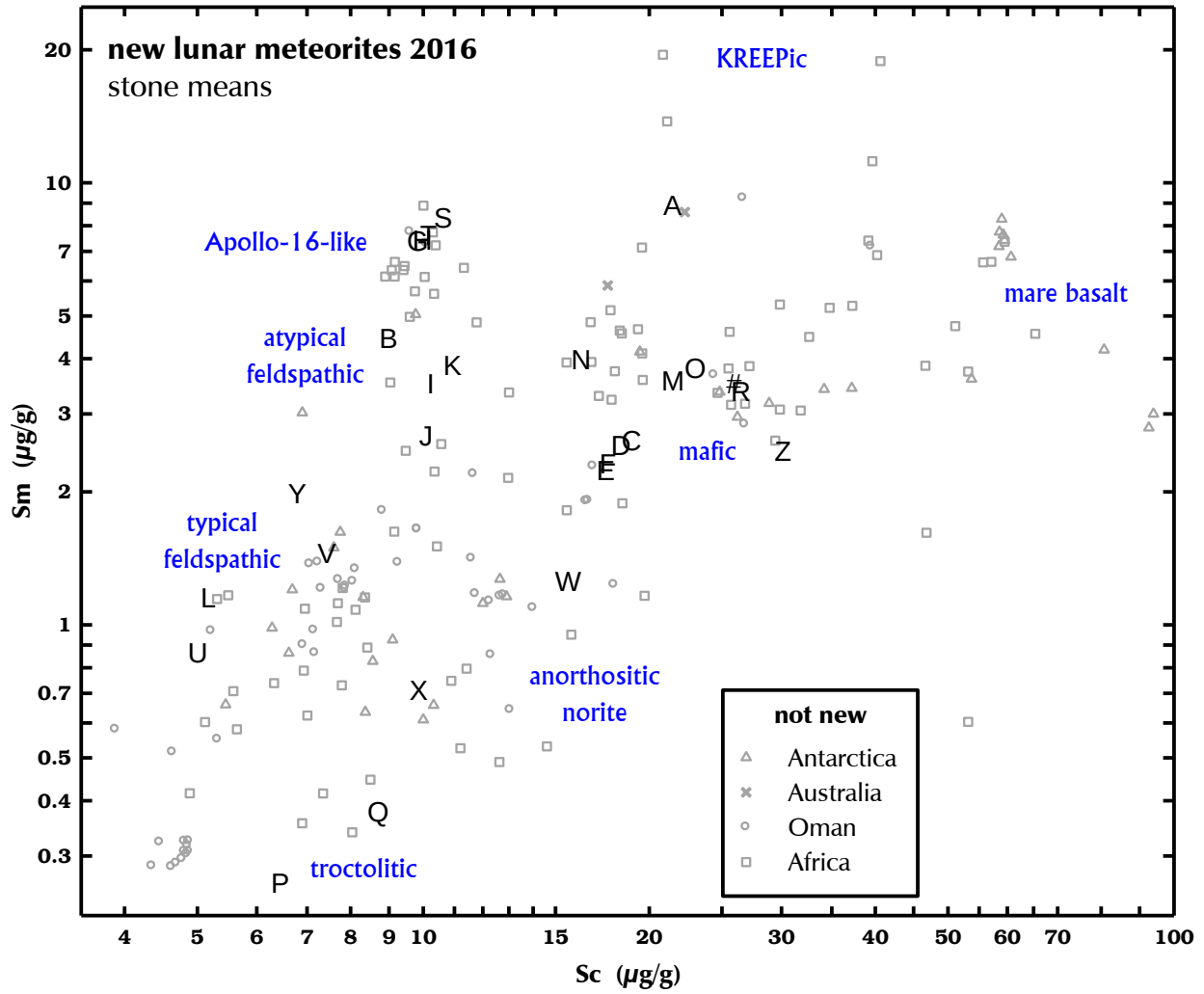

Figure 1. New lunar meteorite stones compared with previously described stones in Sc-Sm space. The “Apollo-16-like” meteorites have compositions similar to the Apollo 16 regolith [1]. Prior to 2007, no such lunar meteorites were known.

Figure 3. JaH 838 (left, R. Bartoschewitz), a regolith breccia, and NWA 10141 (right, M. Morgan) a fragmental breccia.