KEEPING UP WITH THE LUNAR METEORITES – 2013. R. L. Korotev[1] and A. J. Irving[2], [1]Campus Box 1169, 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], 13 new lunar meteorite stones have been announced in the Meteoritical Bulletin online database [2]. We have obtained compositional data for 12 of them (excluding Lynch 002 from Australia [3]), comprising 5 from Oman and 7 from northwestern Africa, and petrographic data for 9 of them. We obtained the compositional data presented here on multiple subsamples of each stone by INAA using methods previously described [4]. The 12 meteorites span much of the compositional range observed among lunar meteorites (Fig. 1).

Oman. Dhofar 1527 {plot symbol ¿, Fig. 1} (53 g) is a metal-rich impact-melt breccia (H. Haack, in [2]) with the greatest concentrations of siderophile elements (e. g., 1190 µg/g Ni, 73 ng/g Ir) of any lunar meteorite that we have studied; 28% of the total iron in our sample is metallic. Concentrations of incompatible elements are at the low end of the range for meteorites of similar Sc (pyroxene proxy) concentration (Fig. 1). **Dhofar 1528** {?} (213 g) is a feldspathic impact-melt breccia (H. Haack, in [2]) that is also compositionally distinct from any other lunar meteorite from Oman [5]. **Dhofar 1673** {¾} (15 g) is a regolith breccia (P. Strickland, in [2]). Although it bears some compositional similarity to Dhofar the 1436/1443 pair {\ and /} [5], the differences, most notably a substantially lower concentration of terrestrial Sr [5], suggest that it is a new meteorite. Also, from their descriptions (C. Lorenz C. and M. Nazarov M., in [2]; A. Bischoff, in [2]) Dhofar 1436 and 1443 are impact-melt breccias. Tiny **Dhofar 1629** {¼} (2.5 g) is a moderately mafic (9.7% FeO) regolith breccia. It is compositionally similar to the Dhofar 925 {[} clan (Fig. 3) but was found 117 km away. Tiny (3.3 g) **Dhofar 1669** {□} is a feldspathic granulitic breccia similar in composition to many other feldspathic lunar meteorites (Fig. 1). Among Omani meteorites, it is all but indistinguishable from Dhofar 026 {△} found 22.5 km to the S, Dhofar 457–468 {△}, found 25.6 km to the SSW, and Shişr 166 {○} found 23.4 km to the NW (Fig. 2). Dhofar 026 and Dhofar 457–468, are known pairs [6,5] and Dhofar 1669 appears likely to be another member of the pair group. Shişr 166 may be also be member of the (launch?) pair group, but the texture is different [5].

Africa. DaG 1058 (1815 g) is a DaG 400 {4} pair; both stones were found in 1998 [2]. **NWA 7262** (413 g) appears to be an NWA 2998 {f} pair, although our sample of NWA 7262 (FeO = 3.13 ± 0.13%) is a bit more mafic than our sample of NWA 2998 (2.7 ± 0.3%). Both these meteorites are highly feldspathic. **NWA 7190** (5.3 g) is another one of the NWA 4936 {o} pair group (also includes NWA 5406, 6221, 6355, 6470, and 6570) that resembles Apollo 16 soil in composition [1]. **NWA 3170** (60 g), the only new basaltic breccia, is another stone of NWA 773{c} clan [7], one dominated by a ferrogabbro lithology like that in NWA 7007 [8]. **NWA 7274** {ñ} (373 g) is a feldspathic fragmental breccia that appears to represent a new meteorite. It is richer in incompatible elements than most other lunar meteorites of similar major element composition (Fig. 1). With 4.5% FeO and 1.0 µg/g Sm, **NWA 7493** {â} is a typical feldspathic lunar meteorite. It has some special compositional and petrographic features, however [9]. With 11.3 % FeO, **NWA 7611** {ç} is a moderately mafic feldspathic breccia, presumably because of a component of mare basalt. It bears a compositional resemblance to NWA 2995 and its many pairs {e} and NWA 5153 {q}, but is poorer in incompatible elements and richer in terrestrial Ba [9].

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References: [1] Korotev R. L. et al. (2012) LPSC43, #1152. [2] http://www.lpi.usra.edu/meteor/metbull.php. [3] Smith C. L. et al. (2012) 75th Met. Soc., #5137. [4] Korotev R. L. et al. (2009) *M&PS* **44**, 1287–1322. [5] Korotev R. L. (2012) *M&PS* **47**, 1365–1402. [6] Warren P. H. et al. (2005) *M&PS* 40, 989–1014. [7] Zeigler R. A. et al. (2007) *LPSC38*, #2109. [8] Kuehner S. M. et al. (2012) *LPSC43*, #1519. [9] Agee C. B. et al. (this conference).

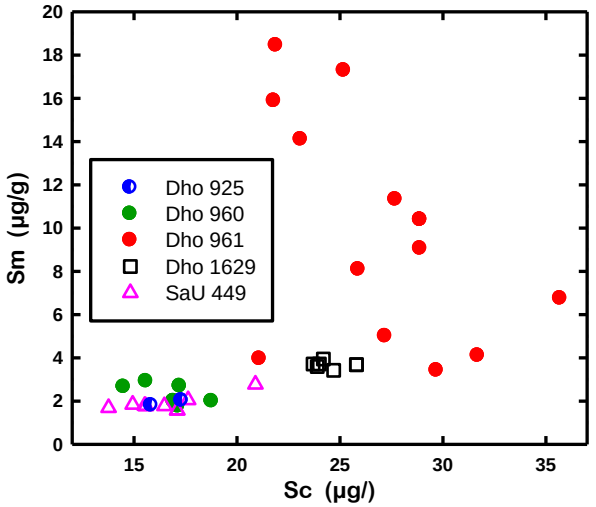

Figure 3. Subsample data. Dhofar 925, 960, and 961 are paired stones; SaU 449 appears to be a launch pair [5]. Among lunar meteorites from Oman, Dhofar 1629 is similar in composition only to the other stones of this plot, but it was found 117 km away from Dhofar 925, 960, and 961.

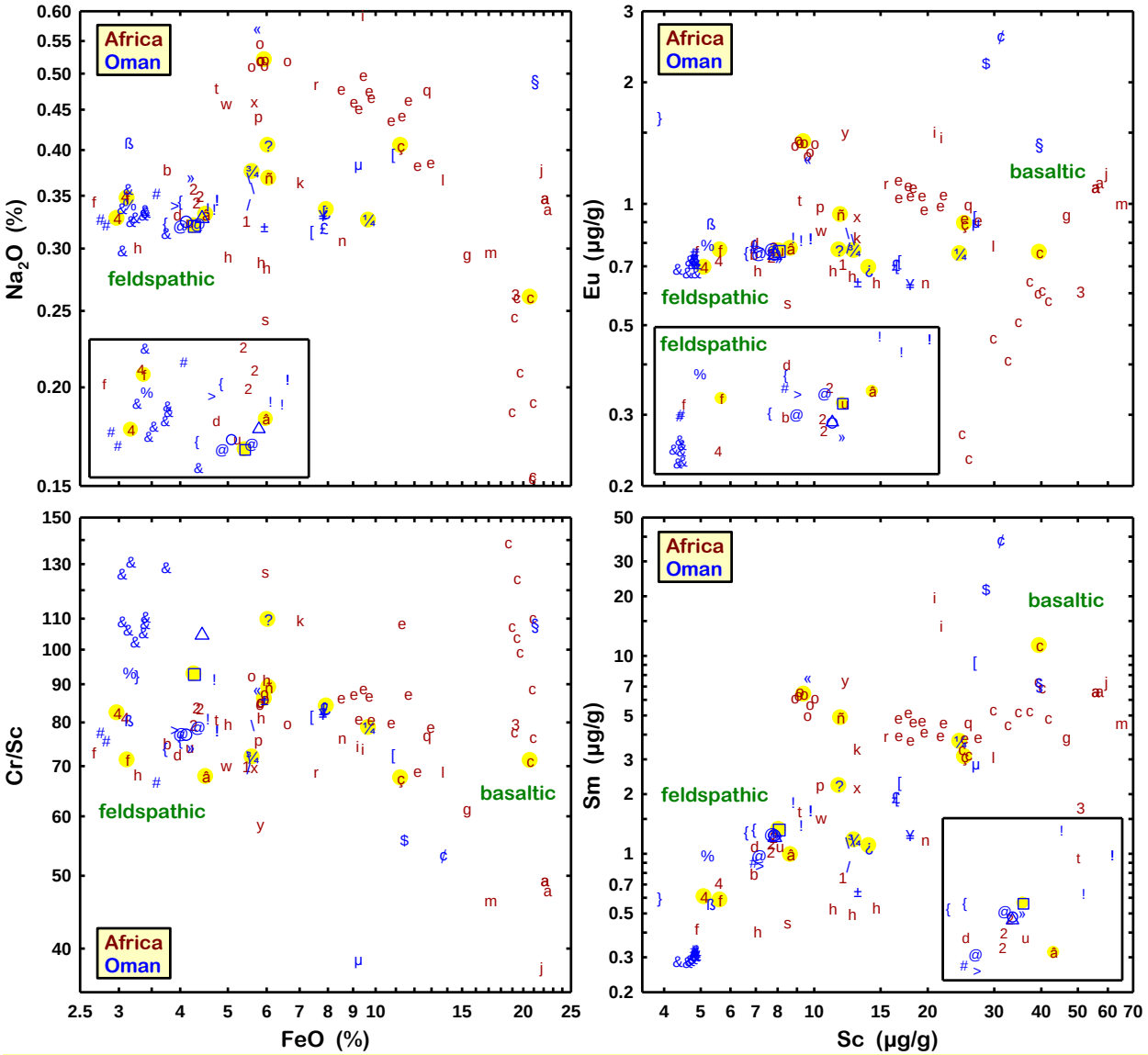

Figure 1. Each point represents a lunar meteorite stone from (mass-weighted mean of all subsamples). New stones discussed in the text are encircled in yellow. The insets expand the busy region in the vicinity of the typical feldspathic lunar meteorites.

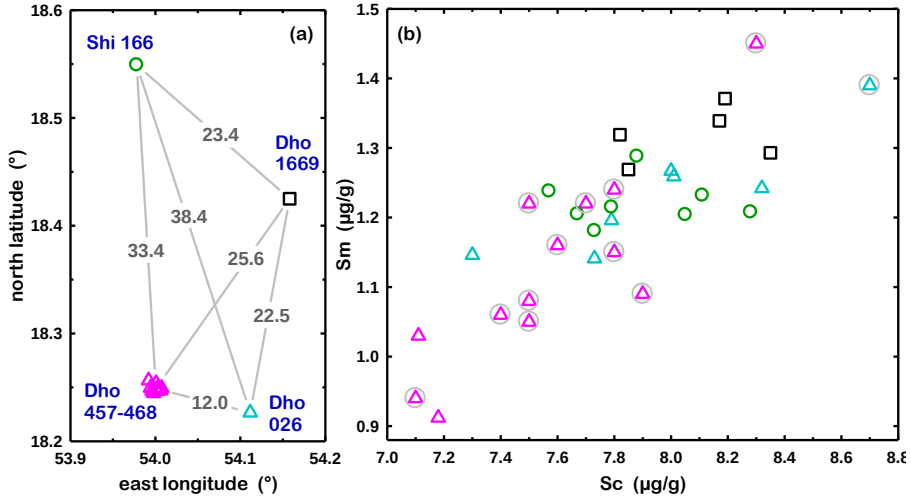

Figure 2. (a) Reported find locations, with distances between them reported in km. (b) For any 2-element pair, compositions for subsamples of these stones overlap. Circled data are for the large samples of [6].