

**METEORITES FOUND ON MISFITS FLAT DRY LAKE**

P. Jenniskens<sup>1</sup>, S. Harlan<sup>1</sup>, M. Zolensky<sup>2</sup>, Q.-Z. Yin<sup>3</sup>, K. L. Verosub<sup>3</sup>, and A. J. Jull<sup>4</sup>, <sup>1</sup>SETI Institute, Mountain View, CA, <sup>2</sup>NASA JSC, Houston, TX, <sup>3</sup>UC Davis, Davis, CA, <sup>4</sup>Univ. Arizona, Tucson, AZ.

**Introduction:** We report the discovery of meteorites along the northern shore of the Misfits Flat dry lake near Stagecoach, NV [1]. The first meteorite was found by Scott Harlan of Salinas, CA, on Sept. 22, 2013. In 18 subsequent visits, 57 more stones were found. Misfits Flat is now an approved Dense Collection Area.

**Petrology:** Two stones, one from Misfits Flat 001 (stone #16) and the outlier Misfits Flat 002 (stone #34), were examined by microprobe at NASA JSC. Misfits Flat 001 is representative of most recovered meteorite fragments in a small 180 x 300 m area. It was classified as LL5 with shock stage S2. Olivine displays mosaicism and planar fractures. We observed pockets of melted material and a few interconnected shock veins. We did not observe maskelynite. Only a few well-defined chondrules were observed. Undulatory extinction was observed for the majority of the olivine crystals. Misfits Flat 001 #16 had an average olivine composition of Fa25.8 (8 best analyses). The percentage mean deviation (PMD) was 1.5%. The CaO content of olivine ranged from 0.02 to 0.04 wt%. Low-Ca pyroxene had an average composition of Fs23.2 Wo1.8 (4 best analyses), with PMD of 0.4%. Kamacite was observed as well as coarse-grained plagioclase.

Misfits Flat 002, found to the west of Misfits Flat 001, appeared visually different from the other recovered stones. It was classified as LL5 with shock stage S4/S5, rather than S2. Olivine has the average composition Fa29.8 (n=5), with PMD of 0.9%. The CaO content of olivine ranges from 0.02 to 0.04 wt%. The Low-Ca pyroxene has an average composition of Fs27.3 Wo1.9 (n = 5) with PMD of 1.3%. No coarse-grained diopside was noted. Coarse-grained plagioclase was present. Ni-rich metal (up to 44 mole% Ni) was observed.

**Discussion:** Misfits Flat is a small dry lake adjacent to the Carson River, within an easy driving distance from the site of the 2015 Meteoritical Society meeting at Berkeley, CA. It is surprising, perhaps, to find more than one meteorite type in this area. We are investigating whether all 58 Misfits Flat meteorites could belong to the same fall and if so when, and whether from a fall with a range of petrographic types. Mixed types were found in at least two other falls before [2,3].

**References:** [1] Harlan S. et al. 2015. MAPS (in preparation). [2] Jenniskens P. et al. 2009. *Nature*, 458, 485–488. [3] Spurny P. et al. 2014. *AA*, 570, 39–53.