

**SUTTER'S MILL CM CHONDRITE: MINERALOGY, PETROGRAPHY, BULK CHEMISTRY, ISOTOPES AND MAGNETIC SUSCEPTIBILITY.**

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**Introduction:** On April 22<sup>nd</sup>, 2012, at 7:51AM of Pacific Daylight Saving time, a fireball was observed by local residents over the foothills of the Sierra Nevada, an hours drive away from UC Davis. Two local residents reported to the first author about the black stones found on their properties. Visual inspections on site confirmed that these specimens are CM-like carbonaceous chondrites found within the strewn field of Sutter's Mill meteorite shower. These two meteorites known as "Emily's Meteorite" (SM43) and "Rick's Seashell" (SM51) are now subject of comprehensive investigation worldwide.

**Sample Preparation and Distribution:** Three petrographic thin sections and polished thick sections were made and shared with the scientific community for electron and ion microprobe work (Nagashima et al., Zolensky et al this meeting). About ~0.4g and ~1.1g sample fragments were obtained from SM43 and SM51 respectively. Fusion crusts were carefully removed, ca. ~0.15g and ~0.46g of fresh fragments were further crushed to obtain homogeneous sample powders for elemental and isotopic measurements. Fragments and/or powders were distributed for oxygen isotopes, C and Ar (Grady et al., this meeting), amino acids (Glavin et al., this meeting), radionuclides (Nishizumi et al., this meeting), C, N and rare gases, S isotopes and concentrations.

**Bulk chemistry and Cr isotopes:** About 30 mg aliquots from whole rock powders were dissolved in a concentrated HF-HNO<sub>3</sub> mixture, and heated in the oven using stainless steel bombs at 190°C for >60 hours. Approximately 35% (10mg) and 2% (0.5mg) of each sample were used for Cr isotope, and major and trace element abundance measurements, respectively. Here we report major and trace element analyses of SM43 and SM51 using the Element XR ICP-MS. Concentrations were calculated by calibrating to a series of known rock standards. Limits of detection (3×standard deviation of background) vary depending on the element in question; REE's were in the ppq (10<sup>-15</sup>) level while higher blank elements such as Na, B, Ni, Cu, Zn, Mg and Ca were ~0.1-0.5ppb. Accuracy was assessed by running a number of known meteorite samples (Murchison, Allende, Tagish Lake, Orgueil, Lance) and comparing our data with published values. Our initial results normalized to Mg and CI and plotted against condensation temperature clearly show CM-affinity of the SM meteorite.

