**CHONDRULES AND ISOLATED GRAINS IN THE FOUNTAIN HILLS BENCUCCINITE.** A. R. La Blue¹, D. S. Lauretta¹, and M. Killgore². ¹Lunar and Planetary Laboratory, Univ. of Arizona, Tucson, AZ 85721, USA, arlabue@lpl.arizona.edu, lauretta@lpl.arizona.edu. ²Southwest Meteorite Laboratory, Payson, AZ 85547, USA.

**Introduction:** The Fountain Hills (FH) meteorite was recently classified as a Bencubbin-like (CBa) chondrite, which are part of the CR clan [1]. The FH O-isotopic composition is indistinguishable from CBa chondrites. Metal and silicate compositions are consistent with the CBa classification. Significant differences between FH and the other CB chondrites were noted. These include abundant porphyritic chondrules and complete lack of sulfide minerals. We are furthering this investigation by analyzing silicate chondrules and isolated grains in FH to determine more about its composition, thermal history, and implications for chondrule formation in the early solar system.

**Analytical Techniques:** A petrographic thin section of the FH chondrite was surveyed with optical microscopy and BSE imaging. Mineral compositions were determined using electron microprobe analysis.

**Results:** Chondrule diameters range from 250 to 3,500 µm, averaging 1,200 µm. Porphyritic and barred-olivine chondrules are abundant. A few small granular chondrules are present. Representative porphyritic (Fig. 4), barred (Fig. 5), and granular (Fig. 6) chondrules are described. The porphyritic chondrule contains large phenocrysts of olivine (Fo96-97 with 0.2 wt.% CaO, 0.1 wt.% Al₂O₃, and 0.5 wt.% Cr₂O₃). Pyroxene (En₇₋₁₋₆₁₋₉₋₀₉₋₀ with 3.7 wt.% Al₂O₃, 0.8 wt.% TiO₂, and 1.0 wt.% Cr₂O₃) is concentrated in the outer portion of the chondrule. Mesostasis is recrystallized anorthite containing 0.1 wt.% Na₂O, 0.2 wt.% FeO, and 1.0 wt.% MgO. The barred chondrule contains parallel laths of olivine (Fo96-97) with interstitial anorthite. Low-Ca pyroxene (En₉₋₁₋₆₁₋₉₋₀₉₋₀ with 1.4 wt.% Al₂O₃, 0.3 wt.% TiO₂, and 0.8 wt.% Cr₂O₃) occurs on the outer edge. The granular chondrule is composed predominantly of low-Ca pyroxene with variable composition (En₉₋₁₋₆₁₋₉₋₀₉₋₀ with 0 – 0.5 wt.% Na₂O, 0 – 0.1 wt.% K₂O, 1.3 – 2.9 wt.% CaO, 0.9 – 3.0 wt.% Al₂O₃, 0.1 – 0.3 wt.% TiO₂, and 0.8 – 1.0 wt.% Cr₂O₃). Minor amounts of olivine (Fo96-97) are present.

An isolated chromian spinel grain (Fig. 1 and 2) was characterized. The spinel has a uniform Mg# = 94. However, it is zoned in Cr and Al with Cr contents increasing from core to rim (Fig. 3). The grain is rimmed by anorthite and the rim is 50 µm thick. Olivine with composition Fo₉₋₁₋₆₁₋₉₋₀₉₋₀ occurs in contact with this grain. Application of the olivine-spinel geothermometer developed by Sack and Ghiorso [2] yields 878 °C using the composition of the spinel closest to the olivine. Cr-Al interdiffusion data for a spinel of composition (Mg₀.₅₁Fe₀.₄₉)(Al₀.₇₃Cr₀.₂₇)₂O₄ have recently been measured at 21.4 kb and 1125 °C [3]. These data suggest that Dₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐₐ…
Figure 1. Plane-pol. optical image of spinel grain. FOV = 900 µm.

Figure 2. BSE image of spinel grain in Fig. 1. FOV = 900 µm.

Figure 3. Compositional variation of spinel (from bottom to top as shown in Fig. 2).

Figure 4. Plane-pol. optical image of porphyritic chondrule. Dia = 1,035 µm.

Figure 5. Plane-pol. optical image of barred chondrule. Diameter = 1,070 µm.

Figure 6. Plane-pol. optical image of granular chondrule. Diameter = 930 µm.

Figure 7. Plain polarized map of Fountain Hills in thin section. Location of chondrules and spinel grains in Figs. 1, 4-6 are indicated. FOV = 3.5 cm.