Baylor University and CASPER present:

Dr. Romy D. Hanna

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Nebular Formation and Parent Asteroid Modification of Chondrules and Their Rims

Abstract: The primitive material comprising carbonaceous chondrites has a complex history from formation in the early solar nebula, accretion to the parent body asteroid, and secondary processing on the asteroid. In order to use chondrite material (i.e., chondrules) to infer early solar nebula processes it is necessary to first unravel the secondary processing effects that have modified them. In this talk I will discuss how we observe a CM chondrite, Murchison, at a variety of spatial scales (microns to centimeters) with a variety of techniques (X-ray CT, EBSD) to determine that impact on the CM asteroid caused deformation, aqueous alteration, and porosity loss. After documenting these secondary processes, we examine the chondrules and their fine-grained rims (FGRs) in more detail and establish that the FGRs formed in a weakly turbulent nebula. We also show that chondrule surface morphology is a primary feature (resulting from the chondrule formation process) that influenced the amount of nebular dust accreted to the chondrule.

BIO: Dr. Hanna's PhD work focused on Murchison, a CM chondrite, detailing how fine-grained dust rims formed around chondrules in the early solar nebula and how these, along with the rest of the chondrite, were modified by secondary processes (impact deformation, aqueous alteration) after their accretion onto the CM parent body asteroid. Dr. Hanna is currently expanding this work to other types of carbonaceous chondrites to help build a more comprehensive picture of the formation conditions of this material in the early solar nebula, how it accreted to form the chondrite parent bodies, and how it has been modified by secondary processes on their asteroids. Dr. Hanna completed her undergraduate degree at the University of Texas (UT) at Austin, Master's at the University of Hawai'i at Manoa, and the PhD at UT Austin.

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Baylor Sciences Building (BSB) Room D.110

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