Title: Sulfur isotope anomalies in Acfer 094 inherited from the Irradiation of the Protosolar Molecular Cloud by Massive Nearby Stars

Abstract:
Spectral line (121.6 nm) and larger or smaller wavelengths produce MI anomalies that define distinct ∆36S/∆33S ratios. Young stars have strong emission at Lyman-alpha, while massive O and B stars dominate the interstellar UV flux. Thus, the photodissociation of H2S can serve to differentiate between massive stars and young T-Tauri stars as the astronomical source of isotope-selective photodissociation. Analysis of paired oxygen and sulfur isotope systematics in cosmic symplectite (COS)−a nm-scale intergrowth of 16O-poor magnetite and pentlandite−in the primitive carbonaceous chondrite Acfer 094 can provide unique insights into photochemical processing of Solar System materials. Acfer 094 shows similarities to cometary material and, therefore, may have formed in the outer Solar System where it could have incorporated 16O-poor water ice that also contained H2S ice like that detected in comets. Sulfur in COS may provide insights into the astrophysical environment for the Solar System formation. In this talk, I'll report the oxygen and sulfur isotopic composition of COS and determine the likely astrophysical UV source responsible for photochemical processing of Solar System solids.