

Title: Star & Planet Formation Studies and Opportunities with SOFIA

Abstract: Star formation, the most fundamental process in the universe, is linked to planet formation and thus to the origin and evolution of life. We have a general outline of how planets and stars form, yet unraveling the details of the physics and chemistry continues to challenge us. The infrared and submillimeter part of the spectrum hold the most promise for studying the beginnings of star formation. The observational landscape recently shaped by Spitzer, Herschel and ALMA, continues to challenge our current theories. SOFIA, the Stratospheric Observatory for Infrared Astronomy, equipped with state-of-the-art infrared instrumentation to a vantage point at 45,000 feet (13.7 km) flight altitude that is above 99.9% of the Earth's water vapor, enables observations in the infrared through Terahertz frequencies not possible from the ground. SOFIA is a community observatory, about to start its sixth annual observing cycle. My talk will focus on recent results in advancing star and planet formation processes using SOFIA's imaging and polarimetric capabilities, and the upcoming science enabled by the 3rd generation instrument HIRMES to be commissioned in 2019. I will show how mid-infrared imaging is used to test massive star formation theories, how far-infrared polarimetry on sub-parsec scales is directly testing the role of magnetic fields in molecular clouds, and how velocity-resolved high-resolution spectroscopy will push forward our understanding of proto-planetary disk science. I will also summarize upcoming opportunities with the SOFIA observatory. For the latest news about your flying observatory, see <https://sofia.usra.edu/>