The Origins Space Telescope is the mission concept for the Far Infrared Surveyor, a study in development by NASA in preparation for the 2020 Astronomy and Astrophysics Decadal Survey.

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http://origins.ipac.caltech.edu/ https://asd.gsfc.nasa.gov/firs/

With a wealth of lines probing the interstellar medium in thousands of galaxies over cosmic time, Origins Space Telescope will:

• uniquely separate the star formation and AGN emission based on robust MIR/FIR diagnostics to determine the cosmic star formation rate density and black hole accretion rate density from the peak through Reionization

• find and characterize galactic feedback as a function of AGN/SF power, mass, age and environment over the past 12 Gyr

• accurately trace the rise of metals across cosmic time (z=1-8) using MIR/FIR fine structure lines as abundance indicators that do not suffer from the degeneracies of common optical indicators

• measure heating and cooling of the multi-phase ISM to infer the physical phenomena that regulate SF efficiency at the peak of cosmic star formation