THE ORIGINS SPACE TELESCOPE – a NASA Decadal Mission Study

M. Meixner[1], A. Cooray[2], D. Leisawitz[3], J. Staguhn[4], and the Origins Space Telescope Science and Technology Definition Team[5]

[1]Space Telescope Science Institute, Johns Hopkins University (meixner@stsci.edu), [2]University of California, Irvine (acooray@uci.edu), [3]NASA Goddard (David.T.Leisawitz@nasa.gov), [4]Johns Hopkins University (staguhn@milkyway.gsfc.nasa.gov), [5](http://asd.gsfc.nasa.gov/firs/team/)

Introduction: The *Origins Space Telescope* is an evolving concept for the *Far-Infrared Surveyor* mission, and the subject of one of the four science and technology definition studies supported by NASA Headquarters to prepare for the *2020 Astronomy and Astrophysics Decadal Survey*. The *Origins Space Telescope* will discover or characterize exoplanets, the most distant galaxies, nearby galaxies and the Milky Way, and the outer reaches of our solar system. This talk will present the Origins Space Telescope Mission Concept 1 (Fig. 1).

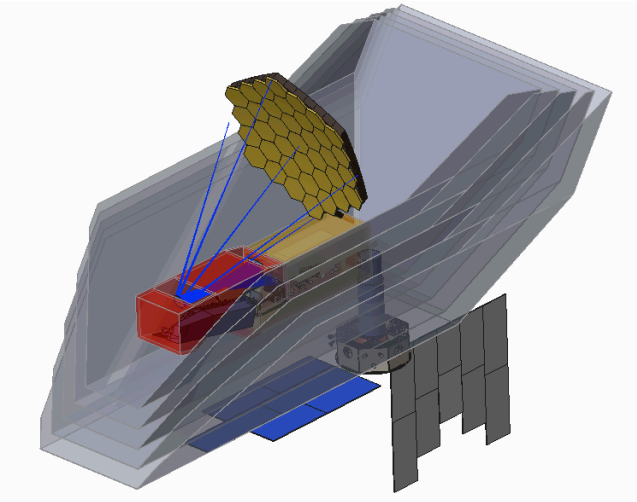

Figure 1: *Origins Space Telescope* mission Concept 1 (4 K baffle omitted to enable unobstructed viewing of the telescope and Instrument Accommodation Module).

The telescope is a ~9 m off-axis, segmented telescope that is cryogenically cooled to ~4 K. A baffle (not shown) and cryocoolers ensure the telescope environment is maintained at ~4 K. The primary is deployed and the secondary is fixed inside the instrument accommodation module. Five instruments covering 5 to 660 μm enable the broad range of scientific activity: Medium Resolution Scanning Spectrometer, R~500 and R~40,000 for 30-660 μm; Far-Infrared Imaging Polarimeter, 40, 80, 120 and 240 μm simultaneous imaging; High Resolution Spectrometer, R~10^5 and R~10^6 for 25-200 μm; Heterodyne Instrument, R~10^6-10^7 for 63 μm and 111 to 566 μm; and Mid-Infrared Imager, Spectrometer and Coronagraph, 5 to 38 μm, R~300, 1000 and 20,000 with special transit spectrometer channel. The telescope, instrument accommodation module, sunshield and space craft would be launched in an 8 m sized fairing. The scope of the Mission Concept 2 will also be discussed.