The GEMINI/GMOS optical transmission spectral survey of close-in gas giant exoplanets

Panwar, V.; Désert, J.-M.; Todorov, K.; Huitson, C.; Bean, J.; Fortney, J.; Stevenson, K.; Bergmann, M.

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for the 2020 Astronomy and Astrophysics Decadal Survey. The study team envisions a large aperture, actively-cooled telescope covering the full mid- to far-infrared spectrum enabling revolutionary scientific discoveries in many areas including: 1) OST will probe our earliest cosmic origins by charting the rise of dust and metals in galaxies over cosmic time, and determine how the coevolution of star formation and supermassive black holes leads to the diversity in galaxies today, 2) OST will follow the trail of water from the birth of the planet-forming disk to the assembly of pre-planetary materials, and in comets to understand the origin of Earth’s oceans, and 3) OST will measure biosignatures in transiting exoplanet atmospheres at mid-infrared wavelengths to assess the habitability of nearby exoplanets and search for signs of life. Equally important to these compelling questions, OST will be a flagship general observatory which provides the astronomical community access to unprecedented discovery space in the infrared. OST will be up to a factor of 1000 more sensitive than previous infrared space telescopes. Its versatile instrument suite will enable deep and wide 3D surveys of the sky from the most distant galaxies to the outer reaches of our Solar system. This presentation will describe the OST baseline mission concept and spotlight its vast science potential.

222 — LUVOIR: Telling the Story of Life

Courtney Dressing; John O'Meara
1 Astronomy, University of California, Berkeley (Berkeley, California, United States)
2 Keck Observatory (Waimea, Hawaii, United States)

The Large UV/Optical/Infrared Surveyor (LUVOIR) is one of four large mission concepts for which the NASA Astrophysics Division has commissioned studies by Science and Technology Definition Teams (STDTs) drawn from the astronomical community. We have developed two architecture variants: Architecture A with a 15-meter segmented primary mirror, and Architecture B with an 8-meter segmented primary mirror. LUVOIR will operate at the Sun-Earth L2 point. It is designed to support a broad range of exoplanet, astrophysics, and Solar System studies. The candidate instruments studied for LUVOIR are 1) a high-performance NUV/optical/NIR coronagraph with imaging and spectroscopic capability, 2) a UV imager and spectrograph with high spectral resolution and multi-object capability, 3) a high-definition wide-field optical/NIR camera, and 4) a high-resolution UV spectropolarimeter. LUVOIR is designed for extreme stability to support unprecedented spatial resolution and high-contrast direct observations of Earth-like exoplanets. It is intended to be a long-lifetime facility that is serviceable, upgradable, and primarily driven by guest observer science programs. In this presentation, we will describe the observatories and provide an overview of the transformative science LUVOIR can accomplish.