Space Science Seminar
Tuesday, 2017 February 28
10:30 a.m.
NSSTC/2096

NASA's Exoplanet Exploration Program

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Host: Dr. Nasser Barghouty

The NASA Exoplanet Exploration Program (ExEP) is NASA's search for habitable planets and life beyond the solar system. The program serves the science community and NASA by implementing NASA's space science vision for exoplanets. The ExEP portfolio includes space missions, mission concept studies, technology development investments, and ground-based science that work together thematically in this discovery-driven field. The ExEP mission portfolio includes Kepler, K2, and WFIRST. Results from the Kepler mission reveal an abundance of small exoplanets in our galaxy. WFIRST will deliver science in dark energy, wide-field infrared survey, complete the exoplanet statistical survey begun by Kepler through microlensing detection and will fly the first high-contrast coronagraph for direct imaging of large cool exoplanets around nearby stars. Recent studies of probe-scale (<$1B total cost) and current studies of large missions for the upcoming Astrophysics Decadal Survey consider coronagraph-based (internal occulter) and starshade-based (external occulter) direct imaging mission architectures. These studies explore trades of cost and science and provide motivation for a technology investment program and future launch vehicle capabilities. Program elements also include the Large Binocular Telescope Interferometer for mid-infrared observations to determine exo-zodiacal dust parameters that are critical to the design of future direct imaging missions. The NN-EXPLORE partnership with the National Science Foundation takes advantage of the National Optical Astronomy Observatory (NOAO) share of the 3.5-m WIYN telescope at Kitt Peak National Observatory for the future commissioning of a NASA high precision radial velocity instrument.

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