
Missions and Technology in NASA's Exoplanet Exploration Program

Stephen Unwin*¹

¹Jet Propulsion Laboratory - California Institute of Technology (JPL) – Jet Propulsion Laboratory
4800 Oak Grove Drive Pasadena, California 91109, United States

Abstract

The Exoplanet Exploration Program (ExEP) develops and manages NASA space science missions for detecting and characterizing exoplanets and searching for possible signatures of life. ExEP includes space missions, mission concept studies, technology investments, and ground-based science that directly support these objectives. Exoplanet science community engagement is very important, with the ExoPAG providing a key forum for input to NASA. In this paper, we provide an overview of the Program, highlighting the mission concepts and technology developments that enable future missions on the path to habitable planets. ExEP missions and mission concepts include Kepler, K2, the probe-scale imaging mission concepts and WFIRST-AFTA. WFIRST represents a major investment that includes dark energy science, a wide-field infrared survey, a microlensing survey for outer-exoplanet demographics, and a coronagraph for direct imaging of planets around nearby stars. The Program supports follow-up observations using the Keck Observatory that contribute to the science yield of Kepler and K2, and mid-IR observations of exozodiacal dust by LBTI. NExSci develops and makes available archives, tools, and professional education for the exoplanet community. Program elements all contribute to the goal of detecting and characterizing exoplanets, helping to inform the science needs and the enabling technologies for the next generation of exoplanet instruments. The exoplanet field is rapidly evolving, and ExEP actively responds to changes in the scientific and programmatic landscape through the active involvement of the scientific and technical communities.

*Speaker