

Planet-Finding Candidate Stars in Solar Neighborhood

Xiaopei Pan

(Email: Xiaopei.Pan@jpl.nasa.gov)

Jet Propulsion Laboratory, Pasadena, California

Discoveries of more than 100 Jupiter-class planets in the past decade provide a good data base for investigation and characterization of extra-solar planets. Space-based missions, such as SIM, TPF and Darwin, etc., will open a new frontier to determine masses of extra-solar planets, to imaging them directly, and more important, to identify habitable planets. Because of limitations of instrument sensitivity and resolution it is necessary to investigate candidate stars in the solar neighborhood in search of planets with and without life. This work presents a statistical analysis of planet-finding candidate stars. In particular, spectral distributions, binary frequencies, luminosity calibrations, and distance distributions are studied for potential objects with planets. Although more than 97% of extra-solar planets discovered so far are rotating around main-sequence stars, three G, K giants have known planetary companions. A study of non-dwarf stars with possible extra-solar planets is conducted. Knowledge of the diversity of extra-solar planets is critical to develop a theory of planet formation and evolution.

