

Exoplanet Demographics with a Space-Based Microlensing Survey

Scott Gaudi
Ohio State University

Abstract: Measurements of the frequency of exoplanets over a broad range of planet and host star properties provide fundamental empirical constraints on theories of planet formation and evolution. Because of its unique sensitivity to low-mass, long-period, and free-floating planets, microlensing is an essential complement to our arsenal of planet detection methods. I motivate microlensing surveys for exoplanets, and in particular describe how they can be used to test the currently-favored paradigm for planet formation, as well as inform our understanding of the frequency and potential habitability of low-mass planets located in the habitable zones of their host stars. I explain why a space-based mission is necessary to realize the full potential of microlensing, and outline the expected returns of such surveys. When combined with the results from complementary surveys such as Kepler, a space-based microlensing survey will yield a nearly complete picture of the demographics of planetary systems throughout the Galaxy.