



Observational Constraints on Theories of Planet Migration and Dynamical Evolution

Jason Wright (1), John Johnson (2), and Geoff Marcy (3)

(1) Penn State, Pennsylvania, USA (jtwright@astro.psu.edu), (2) Caltech, Pasadena, California, USA, (3) University of California, Berkeley, USA

We review the latest statistics of the orbital elements of the over 350 giant planets detected by radial velocity surveys around nearby stars. The distributions of orbital elements of these planets show several curious features including: the familiar "3-day pileup" among lower-mass singleton giant exoplanets; a "1 AU jump" among singleton super-Jupiters; indistinguishable eccentricity distributions between singleton planets and those in multiplanet systems; a preference for circular orbits among sub-Jupiter planets; a flat log-orbital-distance distribution among planets in multiple systems; and a lack of close-in planets orbiting subgiant and giant stars. Since nearly all of the detected giant exoplanets have experienced significant migration, these features form important clues to the nature of migration, and ultimately provide tests for successful theories of planetary migration and dynamical evolution.