Name: Stuart F. Taylor
Email: astrostuart@gmail.com
Institution: Participation Worldscope

Title: Hot Big Planets Survey: Measuring tidal migration of planets, the tidal dissipation strength of stars, and the differences in distributions of iron-r

Type: Poster

Session: Planet Formation and Migration Theories

Abstract: Difference in giant versus medium planet occurence distribution is evidence of inward tidal migration of giant planets. We consider giant planets to be from 8 to 16 earth radii, and medium planets to be from 4 to 8 earth radii.
Several startling differences in orbital parameters of planets hosted by iron-rich and iron-poor stars indicate large differences in the migration of planets hosted by iron-rich stars versus iron-poor stars.
These discoveries have created new debates over what are the causes and results of planet migration.
There is disagreement over whether the presence of the shortest period planets is due to weak tidal dissipation in stars or the inward migration of planets. Only a continual repopulation of the shortest period giant planets can explain why there are more shortest period giant planets than medium planets, given that tidal migration for giant planets due to tides on the star is faster than for medium planets, and given that there are more medium planets than giant planets at periods longer than three days.
We consider it unlikely that tidal dissipation in the star exceptionally weak for tides raised for giant planets compared to tides raised by stars and tides raised by medium planets.
Some of the differences in the distributions in orbital period and eccentricity of iron-rich and iron-poor planet populations can be better explained by planet mergers increasing stellar metallicity, while other differences are better explained by more planets being formed in more metal rich systems.
These results show the value of obtaining planet statistics from one Kepler field in the region of periods of a few days, but we show that we could much more about the migration of planets from better statistics of short period planets by having Kepler observe many fields for planets with periods of 10 to 15 days and less.
Given that Kepler should still have no trouble finding ``big'' planets, i.e. medium and giant planets, we promote that Kepler do a ``Hot Big Planets Survey'' as part of the Kepler II mission.