

Searching for Exo-Asteroids

- There are 2 regions where the gravitational pull of the planet balances that of the Sun. Trojan asteroids collect in these stability points, L4 and L5.
- Over 6000 Trojan asteroids have been found around Jupiter, with a few near Neptune, Mars, and Earth.
- We expect Trojan asteroids in exoplanetary systems.

How can we find them?

- Kepler searches for exoplanets by looking for transits.
- Daniel Angerhausen (Code 667) & a team made an analysis of Kepler data searching for an average light dip that would indicate asteroid transits.
- From combined observations of > 1000 planet-hosting stars, the team found dips in starlight of ~ 2 ppm in areas of the orbit where L4 and L5 should be. The dimming could correspond to an asteroid around each star with a radius of 970 kilometers.

This work has been accepted for publication in the *Astrophysical Journal*.

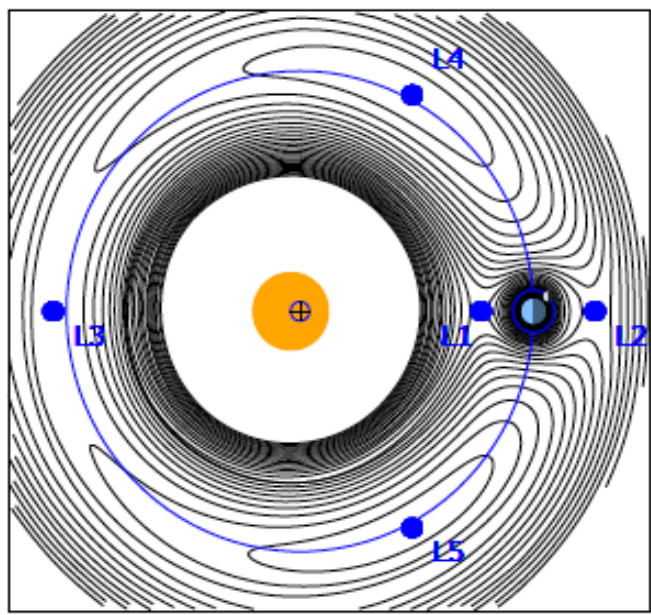
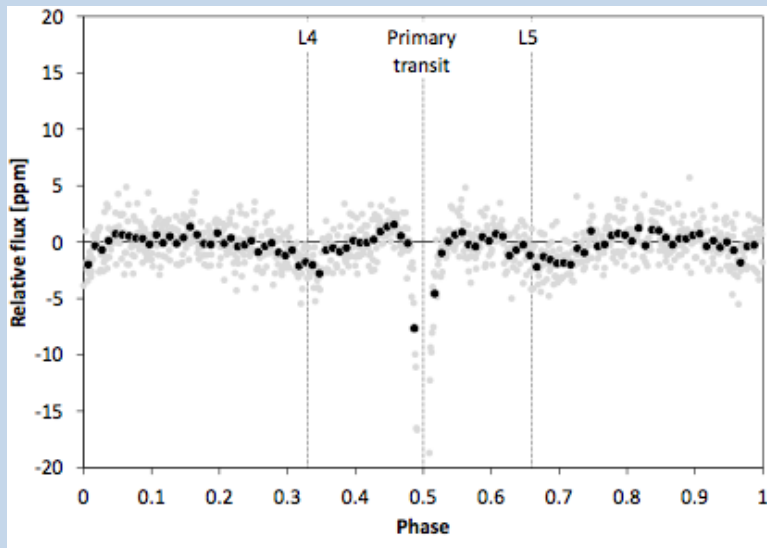


FIG. 1.— Lagrangian points L4 and L5 are at 60° from the planet.

Trojan asteroids collect at L4 and L5.



Light from Kepler planets showing transit dips at the star, and at L4 and L5.