

# Peas in a Pod: Planets in Kepler’s Multi-Planet Systems are Similar in Size and Regularly Spaced

**Lauren M. Weiss**

Institute for Astronomy at Manoa, Hawaii, United States, Parrent Fellow (weisslm@hawaii.edu)

## Abstract

In the California Kepler Survey, we have established precise planet radii, semimajor axes, incident stellar fluxes, and stellar masses for 909 planets in 355 multi-planet systems discovered by Kepler. In this sample, we find that planets within a single multi-planet system have correlated sizes: each planet is more likely to be the size of its neighbor than a size drawn at random from the distribution of observed planet sizes. In systems with three or more planets, the planets tend to have a regular spacing: the orbital period ratios of adjacent pairs of planets are correlated. Furthermore, the orbital period ratios are smaller in systems with smaller planets, suggesting that the patterns in planet sizes and spacing are linked through formation and/or subsequent orbital dynamics. The regular sizes and spacing of the Kepler planets are among the most common outcomes of planet formation, illustrating that our solar system is not among the majority of planetary system architectures. New theories of planet formation might be required to reproduce the patterns in the Kepler planetary systems.