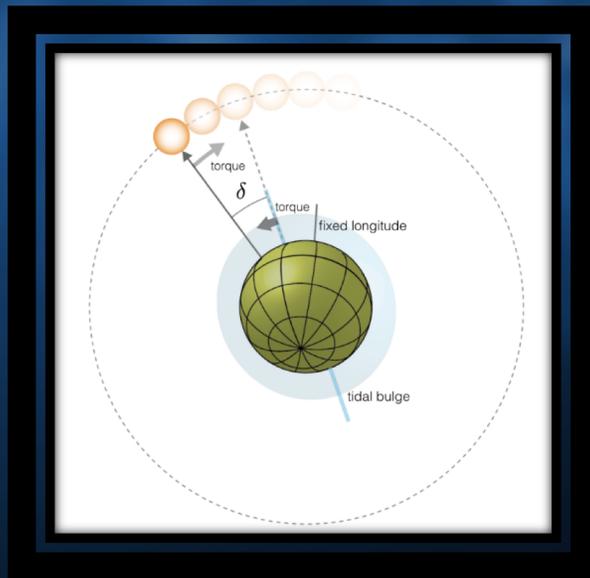
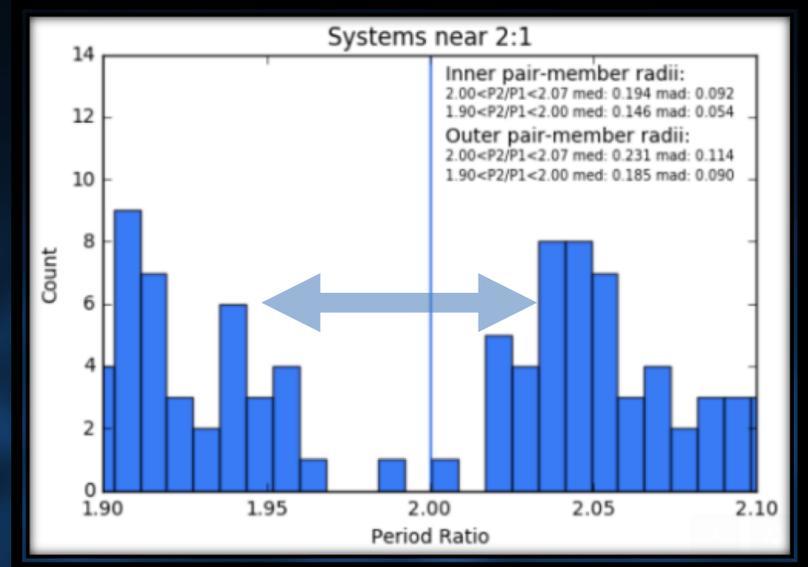


The Case of the Over-tilting Exoplanets

- For almost a decade, astronomers have tried to explain why so many pairs of planets outside our solar system have an odd configuration — their orbits seem to have been pushed apart by a powerful unknown mechanism.
- NASA’s Kepler mission revealed that about 30% of stars similar to our Sun harbor “Super-Earths” – with sizes between Earth and Neptune, having nearly circular orbits, and with “years” lasting less than just 100 days. Oddly, many pairs of such planets lie just outside natural points of stability.



- A detailed dynamical analysis of the pried-apart systems shows that the odd distribution can be explained if the planets have large axial tilts maintained by interactions between the planets in the systems. These tilts generate powerful tidal heating. The situation resembles heating of Solar System bodies such as Io or Enceladus, which may allow for habitable conditions.

Millholland, S. & Laughlin G. (2019) *Nature Astronomy*.
<https://doi.org/10.1038/s41550-019-0701-7>