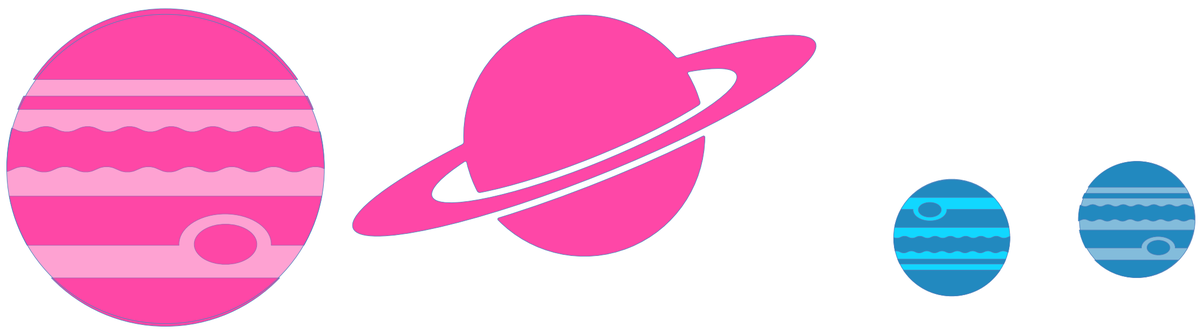

Transition between Gas- and Ice giants explored with TESS and RV follow-up

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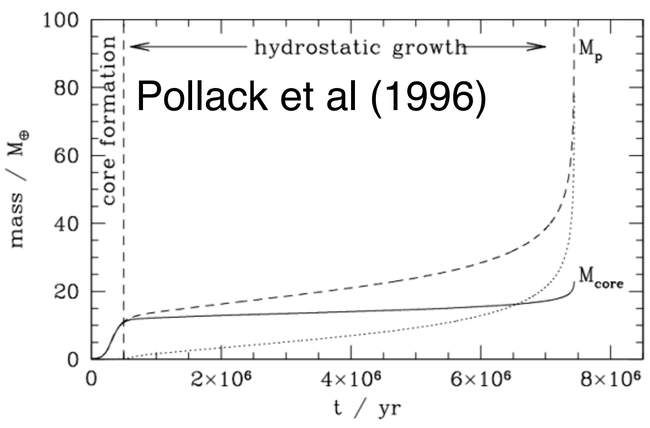
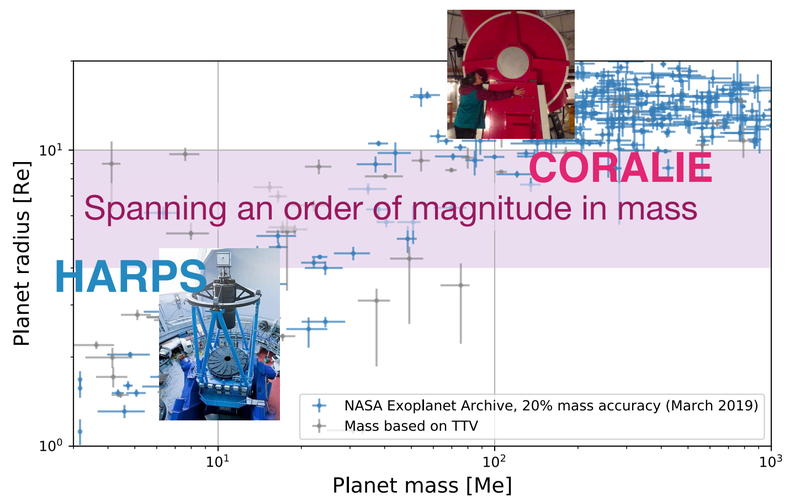
Our Solar System has no planets with sizes that fall between that of Saturn and Neptune. Exoplanets in this radii-range between (4 — 9.1 Re) are important probes of the gas accretion phase of planet formation. During this short formation stage, isolated cores are growing by accreting the surrounding gas in the proto-planetary disk. The growth-rate will determine whether a planet ends up as a **Saturn-like gas giant** or a **Neptune-like ice giant**.

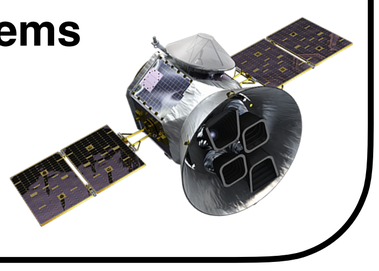


Hsu et al. 2019 find an occurrence rate of ~7 % in Kepler, where as microlensing studies indicate they might be more common (Suzuki et al. 2018).

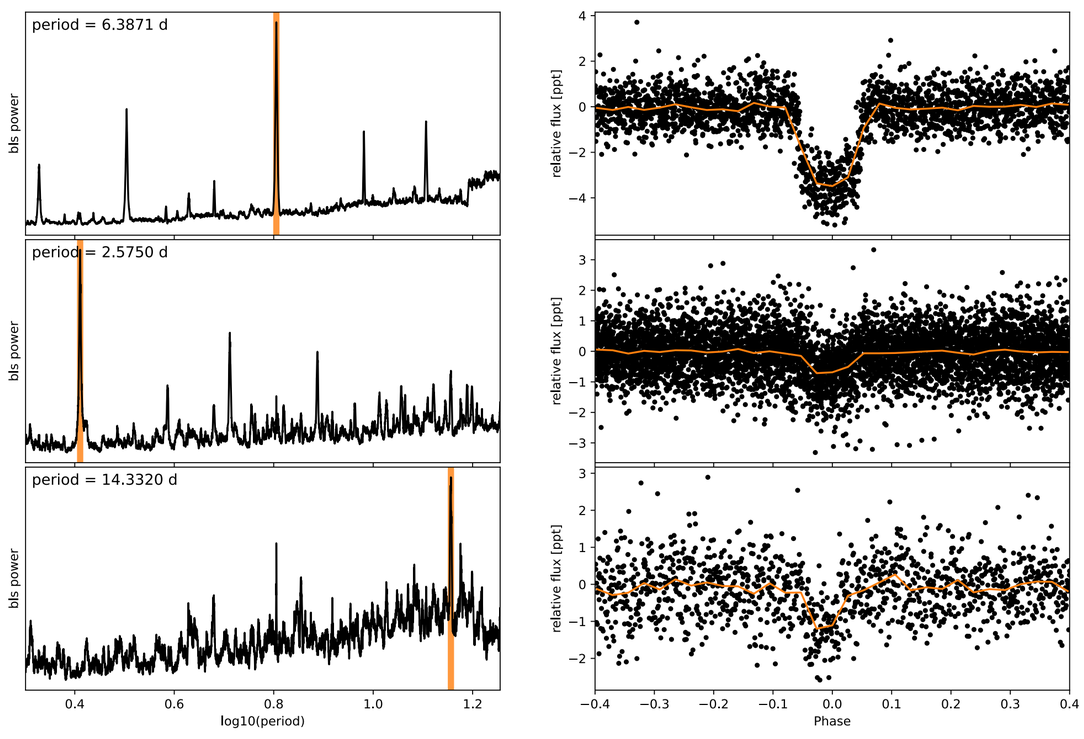
We determine core mass fraction to test if these planets are 'puffy Neptunes' or 'sub Saturns' with transits + RVs.



We target TESS planet candidates with radii between 4 and 9.1 R⊕, using the high-resolution spectrographs CORALIE and HARPS. **In total, 11 new systems are confirmed - 5 of these contain multiple planets**.



TOI-880 with three puffy Neptunes



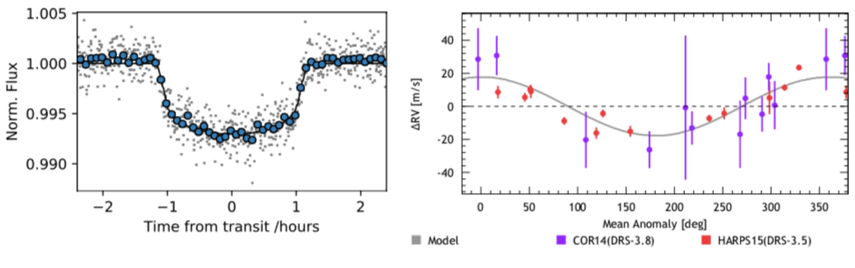
TOI-880.01 @ 6.38 d
Mp = 23.8 +/- 0.8 Me
K = 9.43 +/- 0.32 m/s
Rp = 5.04 +/- 0.33 Re

TOI-880.02 @ 2.57 d
Mp < 3 Me
K < 1.5 m/s
Rp = 2.78 +/- 0.23 Re

TOI-880.03 @ 14.33 d
Mp = 13.1 +/- 1.2 Me
K = 3.97 +/- 0.36 m/s
Rp = 2.87 +/- 0.24 Re

TOI-181 - sub-Saturn

Rp = 6.4 +/- 0.2 Re @ 4.53 days
Mp = 41 +/- 9 Me
Work in progress, active K-star



Stay tuned for **Population study of known sub-Saturns:** Connections to stellar properties (Fe/H, mass, etc) and environment (incident flux, **multiplicity**…)