

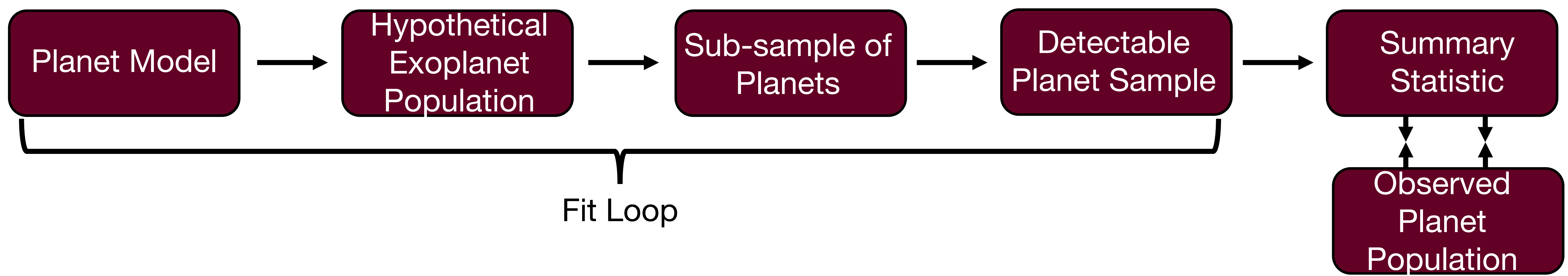
EPOS: the Exoplanet Population Observation Simulator

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What is EPOS?

- A Python code to compare synthetic planet populations to the observed planet populations (Mulders+ 2018)
- EPOS is available on Github for download: <https://github.com/GijsMulders/epos>

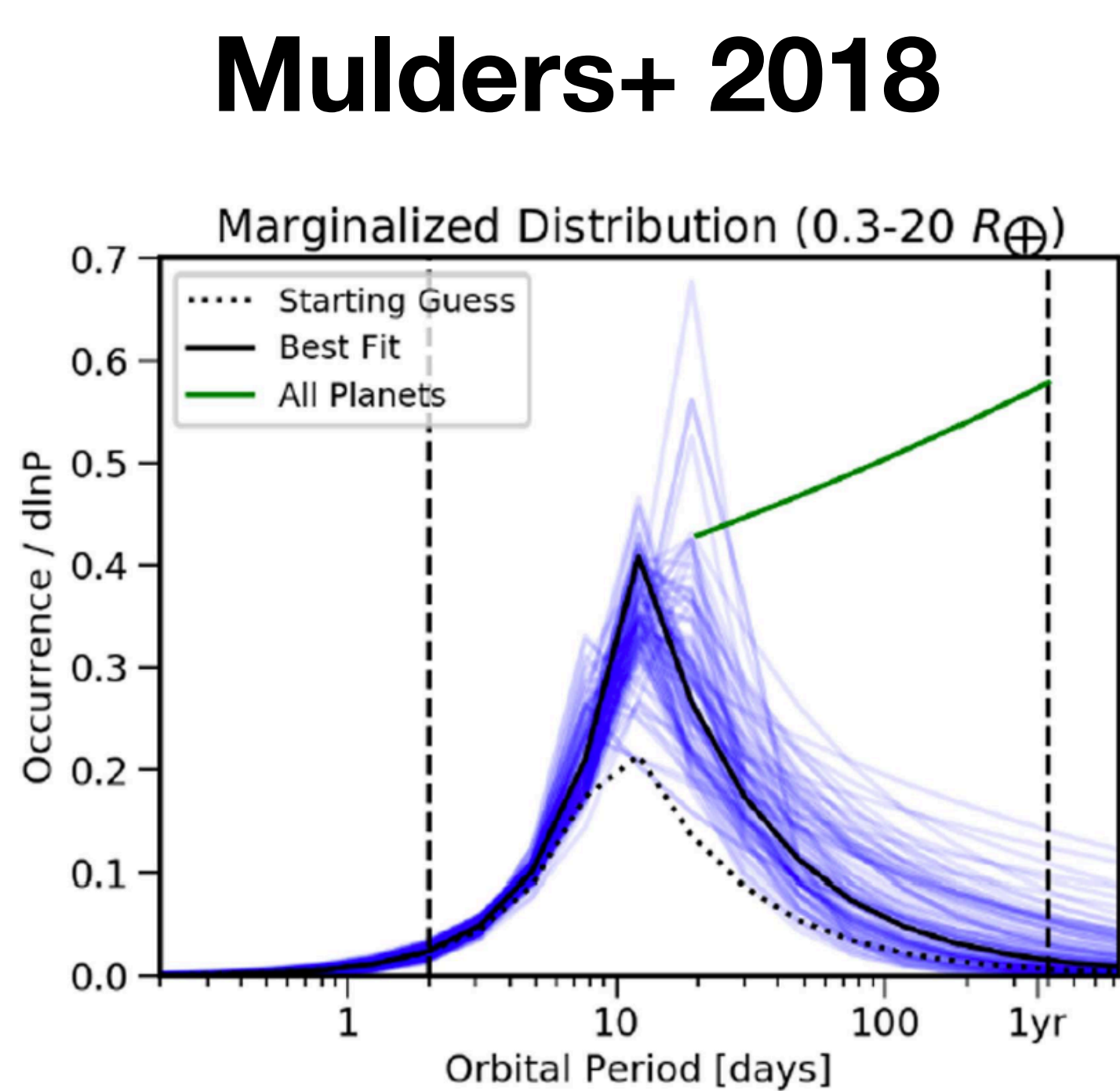
How does EPOS work?



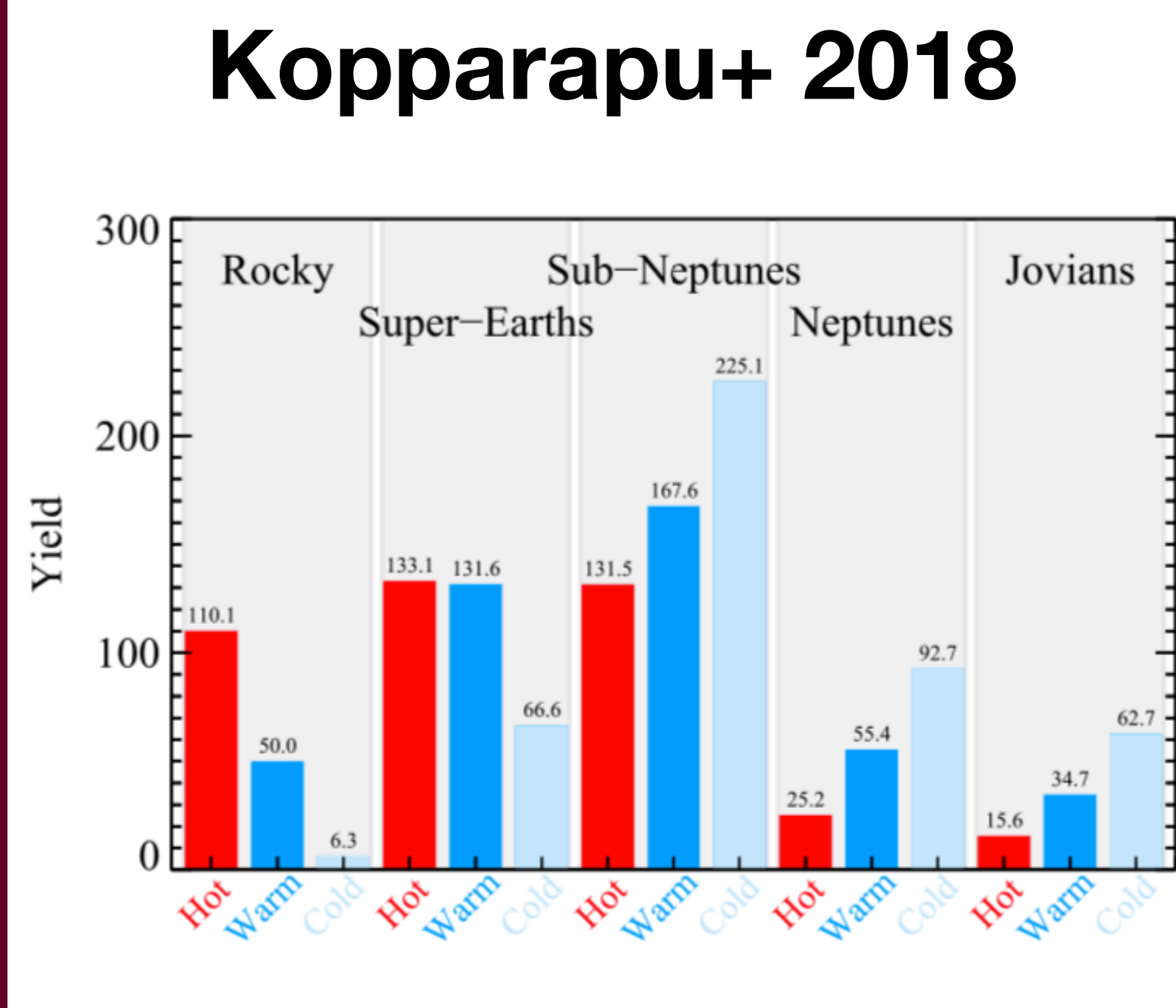
What are the advantages of using EPOS?

1. Can better account for regions with few planet detections (e.g. Habitable Zone or HZ)
2. Can actually measure the fraction of stars with planets (~42% of sun-like stars have planets; Mulders+ 2018) and not just the occurrence rate
3. Can simulate multiple planets per system, hence determine relative planet spacing and mutual inclinations

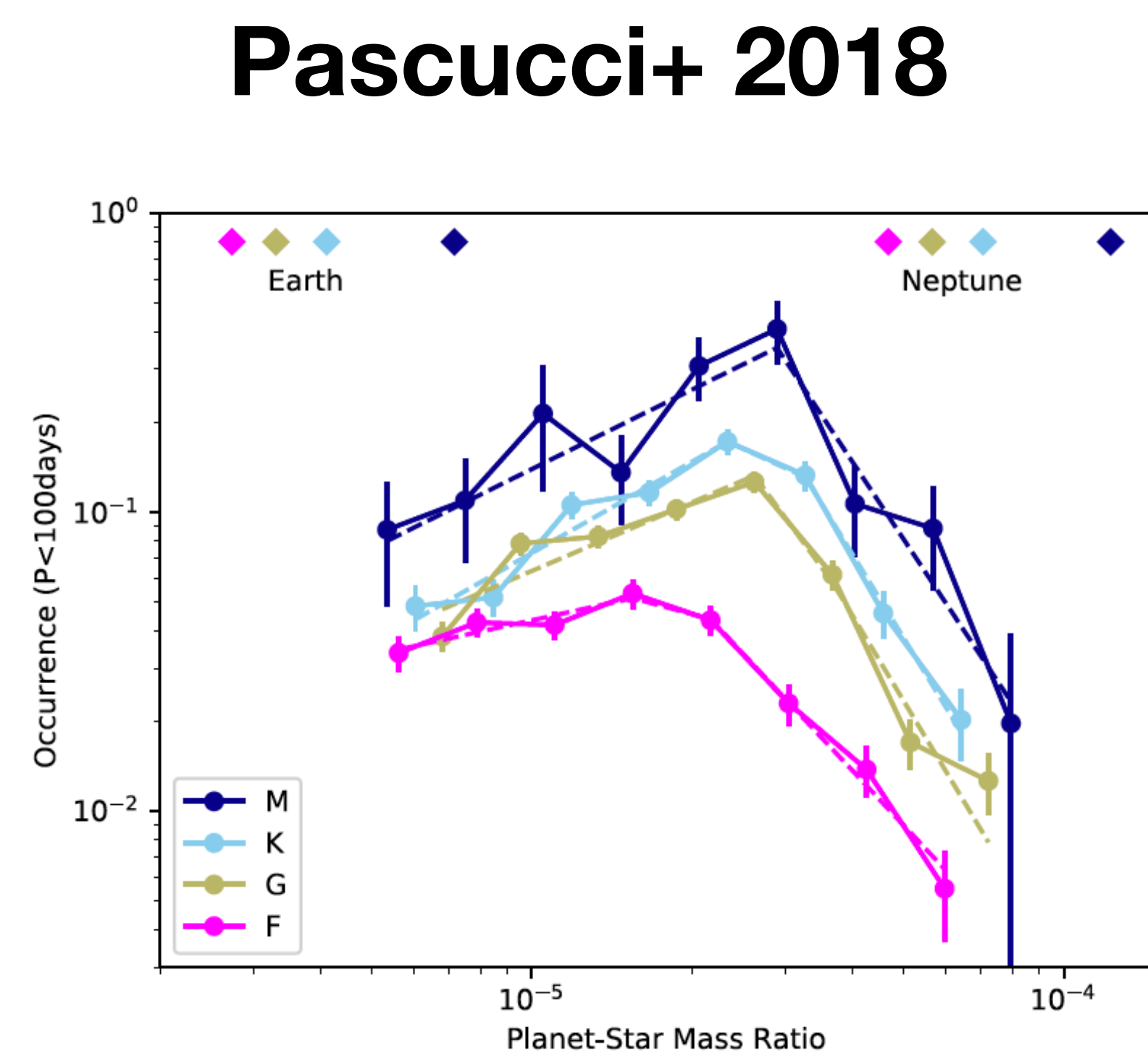
What has EPOS been applied to?



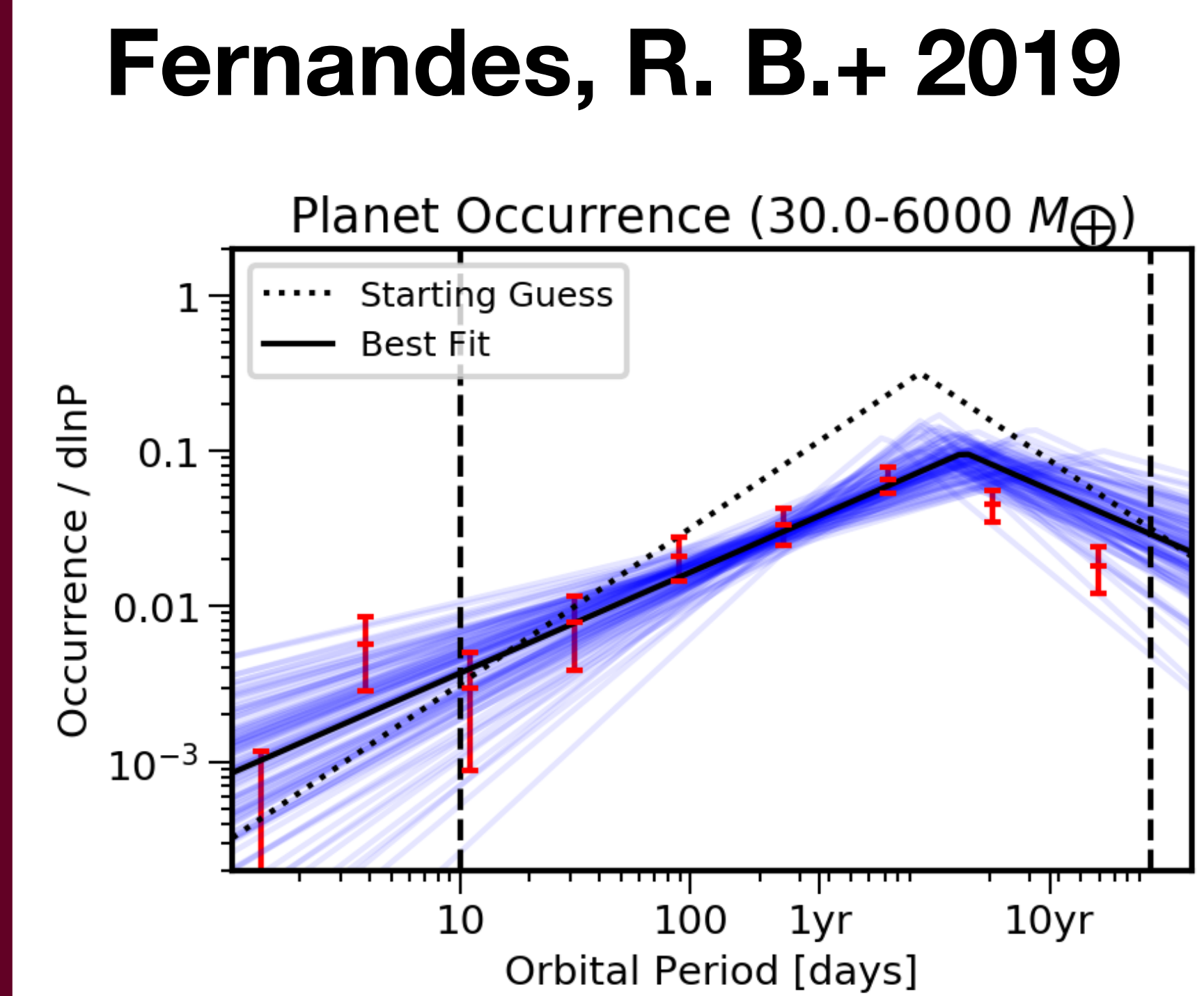
The distribution of innermost planet in *Kepler* systems peaks at ~10 days, which makes our Solar System an outlier at the 3-8% level



Expected exoplanet yields for baseline occurrence rates in each planet category for a 16 m space-based telescope



A universal break in the Planet-to-star Mass-ratio Function of *Kepler* MKG stars



A break at the location of the snowline (~2-3 au) in the radial velocity giant planet distribution

What can EPOS do with TESS?

Since EPOS only requires a list of planetary candidates and survey completeness, we can use EPOS to explore some interesting avenues such as

- Expanding occurrence rate calculations towards the smallest of the M dwarf stars
- Understanding the planet distribution around young stars in nearby clusters and associations

