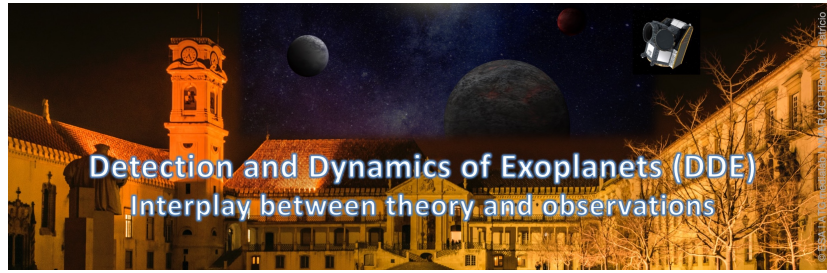


Detection and Dynamics of Exoplanets (DDE): Interplay between theory and observations



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Uniform search of new TESS transiting candidates in the Neptunian desert

Friday, July 11, 2025 12:00 PM (15 minutes)

The Neptunian desert, a scarcity of Neptune-like planets in close orbit around their host stars, is an unexpected finding of the known exoplanet population. Large space-based surveys like TESS, together with ground-based follow-up, are identifying and confirming new transiting planet candidates in and near the desert. However, the targets that end up being followed form a heterogeneous and biased sample. Hence, the current population of planets in and near the desert is incomplete and highly biased. We performed a search for transiting planet candidates in a homogeneous, magnitude-limited sample of main sequence stars well-characterised by Gaia and observed by TESS (almost 2.3 million stars). We applied the new automatic vetting and validation pipeline RAVEN to the TESS data of our stellar sample. This pipeline allows us to find transiting candidates and obtain the probability of them being true planet candidates rather than common false positives, accounting for biases. Hence, we statistically validated several new transiting planet candidates. This uniform search for planets will reveal the radius distribution of planets in and near the Neptunian desert in a statistically robust way. This uniform, well-defined sample, will be invaluable to inform formation and evolution models and to understand the demographics of planets in the desert.

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Session Classification: TTVs and transit-detected compact systems