

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



Contribution ID: 57

Type: **not specified**

Detection of Inner Companions of Hot Jupiters through Transit Timing Variations

Friday 11 July 2025 09:30 (15 minutes)

Transit Timing Variations are a powerful method for detecting and studying additional planets in exoplanetary systems. Hot Jupiters, massive gas giants orbiting very close to their stars, were once thought to exist in isolated orbits. However, recent discoveries of small nearby companions, have shown that these systems can be more complex. By analyzing TTVs, we can measure the masses, orbital periods, and interactions of these companions, even if they do not transit or are undetectable by traditional methods like radial velocity. Systems with TTVs are also excellent laboratories for studying planetary formation and migration, offering insight into how planets settle into resonant or near-resonant configurations. The study of TTVs in hot Jupiter systems challenges previous theories about how these planets form and evolve, revealing new complexities in planetary systems. With high-precision photometric data, TTV analysis continues to uncover hidden planets and improve our understanding of the dynamics and architecture of exoplanetary systems. In this talk, I will present the latest photometric observations of hot Jupiter systems, focusing on their dynamical interactions with close-in companions.

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Session Classification: TTVs and transit-detected compact systems