

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



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The strongly interacting planetary system WASP-148

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WASP-148 is an extrasolar system including two giant planets near the 4:1 mean-motion resonance. The inner one was first identified as a transiting candidate on a 8.8-d period from the SuperWASP photometric survey, then the SOPHIE spectrograph allowed it to be characterized, as well as the outer ($P = 34.5$ days) planet to be detected. Among other effects, the mutual gravitational interactions between both planets cause transit-timing variations of a few minutes, which were detected with ground-based photometry, including by volunteers. This made WASP-148 one of the few cases where such a phenomenon is seen without space-based photometry. Subsequent TESS observations confirmed and refined those results. Different hypotheses were adopted to analyse the data and measure the system's parameters, constrain its stability and its future evolution. They allow interesting comparisons between technics. They indicate in particular a significant mutual inclination of both planetary orbital planes, making WASP-148 a rare case of non-coplanar planetary system. Still, the presence of a possible third, outer planet in the system would affect that inclination.

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Session Classification: RV-detected multiple systems