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



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Orbital Analysis of HR8799 Using GRAVITY High Precision Astrometry

Thursday 10 July 2025 10:00 (15 minutes)

HR8799 is a young multi-planet system that uniquely hosts four super-Jupiter planets and has been wellmonitored through imaging and spectroscopy observations. This is the only directly imaged system for which we observe more than two exoplanets– presenting a unique study of planet-planet interactions through astrometric measurements of high enough precision. Through the continued monitoring of HR8799 with GRAVITY, an interferometric instrument on the Very Large Telescope, we are able to further constrain the orbital parameters of this system to smaller uncertainties than previously possible. GRAVITY is capable of astrometric precision at the 10 micro-arcsecond level– providing unparalleled constraints on the orbital parameters for all four planets. Using the newest constraints on the orbital parameters, I present an analysis on the potential formation history of the system as well as its proposed dynamical stability as derived through N-body simulations.

Presenter: CHAVEZ, Amanda (Northwestern University) **Session Classification:** Astrometry and direct imaging