Contribution ID: **64** Type: **not specified**

Orbital Architectures of Planet-Hosting Binaries & Triples

Wednesday 9 July 2025 09:45 (15 minutes)

In stellar multiple systems, orbits on the scale of ˜10 to 100 au appear to suppress planet occurrence. However, some planetary systems do form and survive in close binaries, and the reasons why provide clues to important factors in successful planet formation. The Kepler sample remains the preeminent source of planetary demographics and, crucially, is also agnostic to stellar multiplicity. I will present a decade-long astrometric survey of the closest-separation binaries among a volume-limited subset of the Kepler sample. These multiples can only be resolved with large-aperture diffraction-limited data, and adaptive optics imaging and masking from Keck/NIRC2 provides uniquely stable astrometry over very long time baselines. I will summarize some of the key findings from this long-running program, focusing in particular on the role of alignment between stellar and planetary orbital planes. With a sample size ˜3x larger than previous work at these binary separations, we are now able to compare the orbital properties of different subsets of our sample, finding intriguing trends with host mass, single- versus multi-planet systems, and binary separation and mass ratio.

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Session Classification: Planets in binary systems