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PHYSICS AND ASTRONOMY COLLOQUIUM (Online)

Dr. Tim Brandt

UCSB

"Discovering, Weighing, and Characterizing Exoplanets and Brown Dwarfs"

Abstract

"I will present a combination of three observational techniques–astrometry, radial velocity, and imaging–to discover, weigh, and characterize massive exoplanets and brown dwarfs. While thousands of planets are known, only a few have both measured masses (from radial velocity and astrometry) and atmospheric properties (inferred from spectra). Advances in adaptive optics and infrared instrumentation now enable us to see young exoplanets millions of times fainter than their host stars. Despite huge gains in sensitivity, however, high-contrast imaging surveys remain plagued by a lack of discoveries. I have calibrated a huge data set of stellar reflex motions; it can identify unseen planets and brown dwarfs by the gravitational tugs they exert on their host stars, and enable us to measure their masses and orbits. We have already begun to discover and weigh new substellar companions by targeting accelerating stars. With masses, orbits, and spectra of a growing sample of planets and brown dwarfs, we can finally test models of substellar formation and evolution."

Wednesday, February 2, 2022

3:30 p.m. PDT

via Zoom: https://uvic.zoom.us/j/81464538080