Alignment and Origins of Exoplanets from Transits across Gravity-Darkened Stars

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The 1995 discovery of planets that orbit their stars more than 10 times closer than Mercury does our Sun ("Hot Jupiters") has challenged our ideas for how planets form and evolve. These planets were initially presumed to form like our giant planets, but then to migrate inward due to gravitational interactions with the protoplanetary disk. New measurements of the orbital planes of exoplanets with respect to their stellar equator -- spin-orbit alignments -- enable testing of the migration hypothesis. I will present a new technique that I developed to measure spin-orbit alignments using Kepler lightcurves for planets transiting across oblate, fast-rotating stars. Along with other ongoing alignment measurements using other techniques, I will show that the observations are not consistent with orderly orbital migration. Next, I will show that these misaligned close-in planets arrive at their misalignment early in their lifetimes -- the first planet around a pre-main-sequence star is both misaligned and rapidly precessing. Finally, I will show some initial results for spin-orbit alignments of longer-period planets that indicate that they may represent an independent population from Hot Jupiters.