

The formation and long-term evolution of circumbinary planetary systems across the H-R diagram

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Searching for circumbinary planets using orbital dynamics

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Planets orbiting single stars transit almost strictly periodically. Yes, there can be some small transit timing variations (TTVs), but these are typically on the order of seconds or minutes. Fundamentally, we find planets around single stars assuming periodic transits, and then characterise any TTVs after the fact. This is not possible for circumbinary planets because geometry and 3-body dynamics create TTVs on the order of hours, days or even weeks. The TTVs are larger than the transit durations, which to further complicate things, also vary. I will demonstrate methodology and results from the STANLEY planet search, which directly incorporates dynamics into the search algorithm.

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