# Department of Physics Colloquium

**Wednesday, April 16th at 4:00 p.m. / SH 121**
**Pre-Colloquium at 3:30 p.m. / SH 108**

## Planets of the Twin Suns:
## Revealing the Orbital Dynamics of Binary Star Planets

**Speaker: Dr. Billy Quarles**

**Abstract:**

The discovery of circumbinary planets, or "Tatooines," orbiting binary star systems has transitioned from science fiction to observational reality, largely driven by the Kepler Space Telescope. This talk will explore the intricate orbital dynamics inherent in these systems and their pivotal role in exoplanet detection. Dr. Quarles will delve into how astronomers numerically model the complex gravitational interactions of three-body systems and apply these models to better understand the observable features that influence planetary stability and orbital evolution. Through the transit method, precise photometric measurements reveal the periodic dimming of starlight caused by a planet passing in front of its host star, which are understood through the dynamics of three-body systems. He will discuss how the analysis of transit light curves provides insights into planetary radii and orbital periods, and how the inherent complexities of binary star systems introduce unique challenges to this method.

This talk will highlight the interplay between observational data and theoretical modeling, demonstrating how these discoveries refine our understanding of gravitational dynamics and planet formation in complex environments. Overall, this talk will emphasize the fundamental physics principles that underpin exoplanet detection, illustrating how these techniques serve as powerful tools for probing the universe, and test our growing understanding of planetary systems.