Name: Tara Fetherolf
Email: Tara.Fetherolf@gmail.com
Institution: San Diego State University
Title: The Mass and Radius of the Eclipsing Binary KIC 8736245
Type: Poster
Session: Eclipsing and Interacting Binaries
Abstract:
Co-authors: William F. Welsh, Jerome A. Orosz, Gur Windmiller, Richard A. Wade

The stellar mass-radius relationship is fairly well understood for stars greater than ~0.8 solar masses. However, for late K and M dwarfs there is a well-known discrepancy between theory and observations, in that the observed radii are often larger than predicted by several percent. We examine the low-mass binary star system KIC 8736245 to help understand the nature of the discrepancy. KIC 8736245 has a Kepler magnitude of 13.8 with stars of masses of 0.96 and 0.76 solar masses on nearly circular orbits that exhibit a 36% primary eclipse depth and 15% secondary eclipse depth. Its orbital period is 5.07 days, making the binary more widely separated than most low-mass binary systems that have precise dynamical mass and radius estimates. This is important since tidal effects are suspected as the cause of bloating the stars. We use Kepler data supplemented with multicolor photometry from Mount Laguna Observatory (MLO) and spectroscopy from the Hobby-Eberly Telscope (HET). Preliminary results show that the stars' radii are indeed larger than predicted for their mass and ages, suggesting that more than tidal interactions may be responsible for the enlarged radii of late-type stars.