Probing Stellar Remnant for Planet Candidate; Analysis of K2 Target 251248385

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White dwarfs, remnants of Sun-like stars which have completed their evolution, are one of the most common types of stars in space. Despite this, a full, surviving exoplanet has never been found to be orbiting a white dwarf leading many to wonder whether or not Earth will survive the Sun’s evolution into a white dwarf. With the identification of K2 Target EPIC 251248385, additional research was necessary to confirm the transits and white dwarf signal were coming from the same astrophysical source. The software package ?PyKe? was utilized this year to ?investigate the Kepler light curve aperture. ?Principal component analysis displayed that the transits were originating from a single pixel. Generating a new light curve from this pixel revealed the absolute transit depth, which was unconstrained previously. Images taken with the 2m LCOGT telescope revealed that a potential target star in the single Kepler pixel was actually a cluster of three stars, but no clear transits were seen from any of the potential target stars in the images. The dilution factor and ratio of planet to star were calculated for the target. Analysis of transit depths in the single pixel light curve showed that the transits were more likely to be coming from the white dwarf rather than the two other sources. However, the transit duration and shape appear atypical for white dwarf systems. Thus, despite determining the potential sources and relative sizes for the potential exoplanet candidate, whether this planet is real cannot be confirmed without additional data.

Awards Won:
Second Award of $1,500