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The Study of Variability in Oxygen-Rich Proto-Planetary Nebulae

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In this project, I am studying and analyzing the light and color variations for two proto-planetary nebulae (PPNe). PPNe is a stage in a star's life where the star is in the process of losing its outer layers and exposing its core. I observed at the Valparaiso University Observatory, using the 0.4 meter telescope and an electronic camera to take digital images. I reduced these data using an image processing program to get the numerical data results. I plotted these results as a light curve showing the variation in brightness of the star versus time. By observing in three different filters, I also searched for variations in color to see if the change in color was correlated to the change in brightness (i.e., the star is hotter when brighter, cooler when dimmer, etc.). This is a long-term study and, in addition to my observations, there are 14 years of previous data on these objects. In the poster, I present the results of all the data for these two PPNe. They have periods of 114 days and 101 days, with a correlation between brightness and color; both show a cyclical variation in brightness with amplitude varying from year to year.

Information about the Author:
Kristie Shaw is a junior in the Physics and Astronomy Department with a double major in astrophysics and mathematics. She has been a part of this research project for two years now, and Kristie and Dr. Hrivnak have plans to publish a paper on the results. After completing her undergraduate degree, Kristie plans to get her doctorate in astrophysics and then go into a research field of astronomy, preferably at NASA.

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