

## **Observational Studies of Proto-Planetary Nebulae**

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We are observing the light variability through time of a sample of 26 proto-planetary nebulae (PPNe). These observations are being carried out using Valparaiso University's 0.4 m reflector telescope and CCD digital imaging device. A total of 28 nights of observing were accomplished last summer and research has continued throughout this past fall and winter. Of the sample of 26 PPNe, light curves displaying changes in magnitude through the last 3.5 years (2008-2011.5) were constructed for nine objects. All were variable within a range of 10-50%. Five showed cyclical variability of ~40-150 days, 3 displayed short-term periods of ~10-20 days, and one is possibly cyclical but no period has been determined.

### *Information about the Authors:*

Christopher Miko is a junior physics and chemistry major. This research reflects his first year as an undergraduate researcher, and he hopes to continue studying evolved stars this upcoming summer. Rachael Jensema is a junior physics and Chinese/Japanese studies major. This research is also a product of her first year doing undergraduate research. She plans to do research at the University of Minnesota-Twin Cities this summer.

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