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Binary Stars in Planetary Nebulae

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Title: *Binary Stars in Planetary Nebulae*

Abstract:

When a star like the sun dies, it swells into a red giant and then expels its outer layers to form a planetary nebula. Eventually the outer layers leave the leftover core and it becomes a white dwarf. The cause of the many exotic shapes in the planetary nebulae is unknown; however, it is thought that binary stars may play a role in the shaping process. In this project we are studying the central stars of planetary nebulae to see if they vary in brightness, and to see if that variability is due to the central star having a binary companion. Data is collected with the SARA North and SARA South telescopes. We have recently found the central star of the planetary nebula PN G337.0+08.4 to vary with a period of 0.2959 days (7.102 hours). We have data for this object in green (V), red (R), and blue (B) filters. The data strongly indicates that the central star does have a binary companion. Using a binary star modeling program we have found several possible sets of physical parameters for the binary central star of the planetary nebula PN G337.0+08.4.

About the author:

Hannah Rotter is a junior physics major, who has been interested in astronomy since childhood. She hopes to eventually go to graduate school with a program in Astrophysics. She is also the secretary of the Society of Physics students and a member of the service fraternity Alpha Phi Omega.