**PHYS 354 Project 7: Modeling Eclipsing Binary Stars**

Due: Jan. 29

Your goal here is to understand the nature of the eclipsing binary star system in open cluster M23. Work only with the cleanest lightcurve systems: Star 16, Star 166, Star 519 and Star1267. Using the technique you developed for the ZAMS cluster project, use the measured R-I to find a range of possible R-I values of binary components. For every step of the project, be sure you are using reddening and extinction correctly. For this work you should use the R and I transmission curves from the PowerPoint near the beginning class, since those are curves for the actual filters we used. Using the measured I magnitude, deduce your best estimate of R-I for each component. There, recognizing that a third star could exist in the system. Using the measured orbital periods for the stars and masses derived from the stellar colors, you can determine the orbital semi-major axis. Noting that these orbits are very close to circular you can determine the stellar radii and check for consistency there as well. As with the LPV project, you may, or may not, need a conversion from R-I to B-V.

Create a poster that:

1. Describes stellar color index, luminosity and HR diagrams

2. Discusses the nature of binary stars and what can be learned from them

3. Presents the results of your work, along with consistency checks