Observations of AG Pegasi by the Harvard Observing Project

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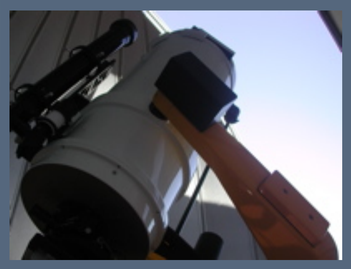
Harvard Observing Project (HOP)



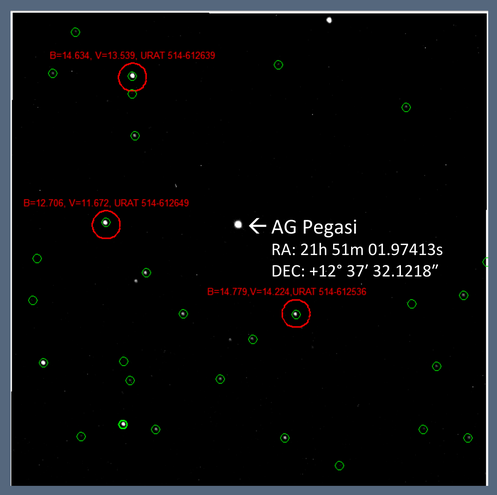
The Harvard Observing Project (see talk 314.03 by A. Bieryla and poster 240.32 by C. Schumer) engages both graduate and undergraduate students alike in learning about our universe. The program uses Harvard's Clay Telescope, a 0.4m DFM design, and an Apogee Alta U47 imaging CCD.

What is AG Pegasi?

AG Pegasi is a symbiotic binary star, composed of a red supergiant and a white dwarf. The white dwarf's luminosity is variable, periodically fluctuating between 400 – 3700 $L_{\odot}$. Between 1860 and 1870, AG Peg brightened from magnitude 9 to 6, before gradually dimming for over a century. In 2001, Kenyon et al. proposed accretion from the larger star as a possible explanation for the increases in luminosity. Consistent with reports of AG Peg's 2015 outburst (Alert Notice 521), HOP observed that AG Peg had begun to brighten once more.

Observation

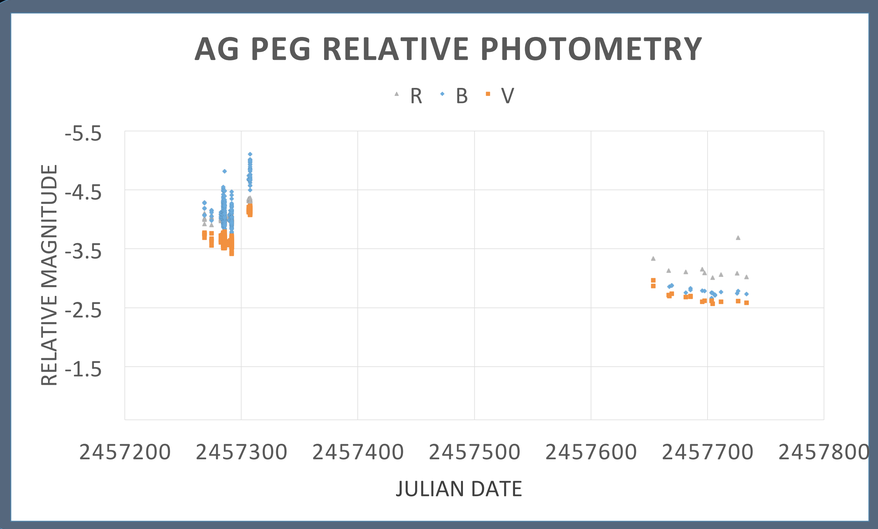
- HOP observed AG Peg from September 3rd, 2015, to December 10th, 2016 using Harvard's 16-inch Clay Telescope
- Observed during 2015 and 2016 Fall semesters
- Over 800 images obtained
- Exposures ranged from 1-150sec
- Observations in Bessel BVR filters

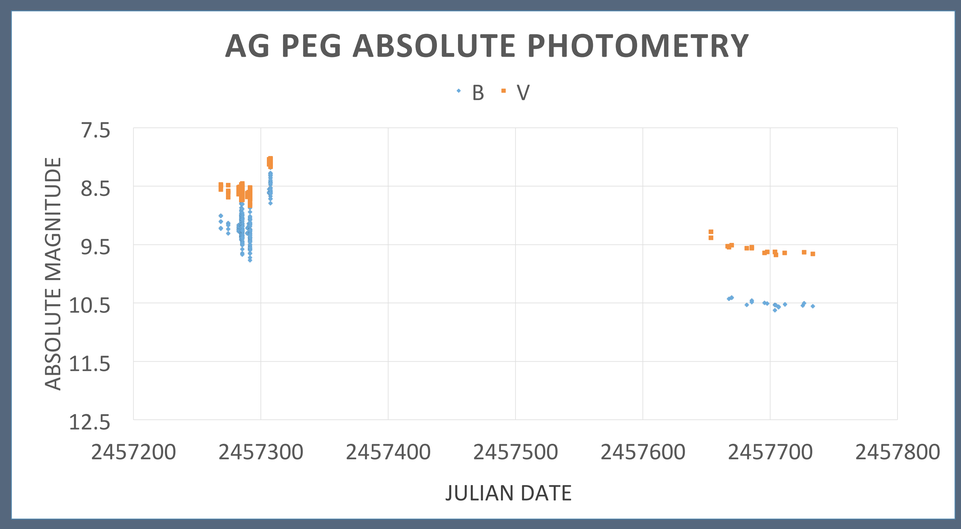


AG Pegasi and reference stars

Reduction & Analysis

- MaximDL software was used for image reduction and photometry
- Absolute photometry was performed on the B and V filters using SDSS magnitudes for reference stars
- Relative photometry was performed on all filters
- **The light curves produced for the B, R, and V bands suggest that the star's luminosity has decreased since 2015**





Conclusions

- AG Peg's luminosity increased by approximately one magnitude from September to October 2015
- AG Peg's luminosity decreased by two magnitudes from October 2015 to December 2016
- Continued monitoring is necessary to determine ongoing variability

References:
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