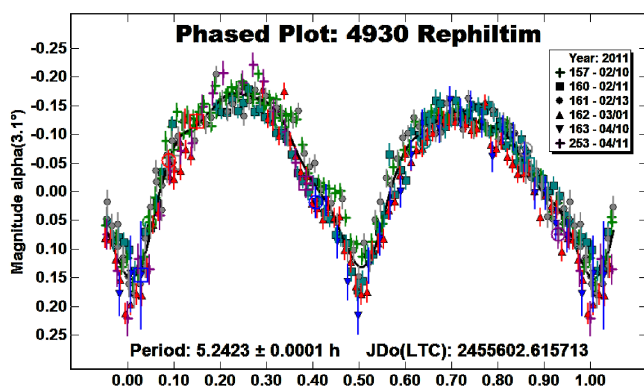
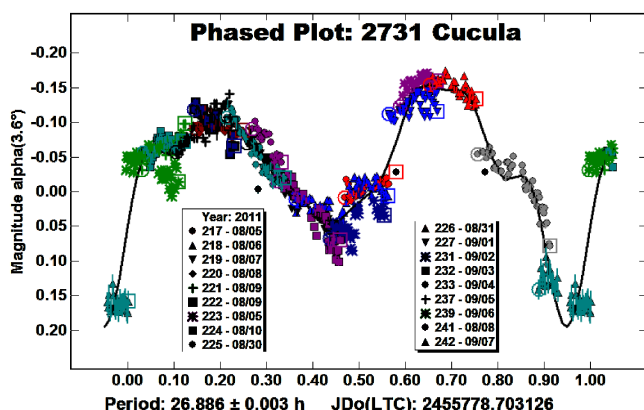
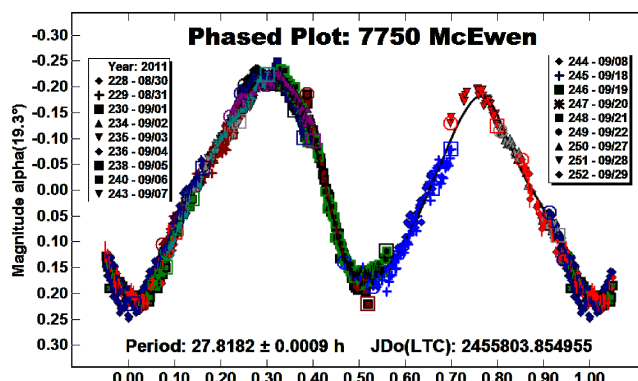
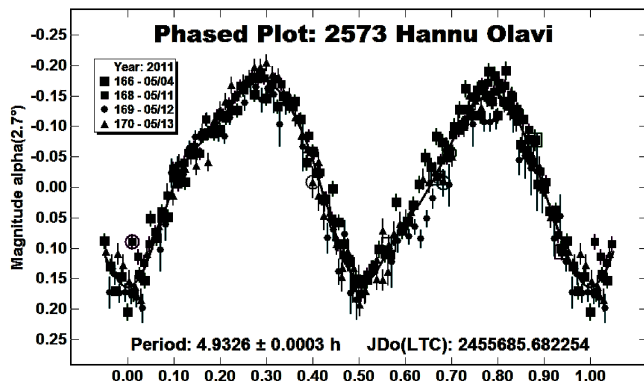
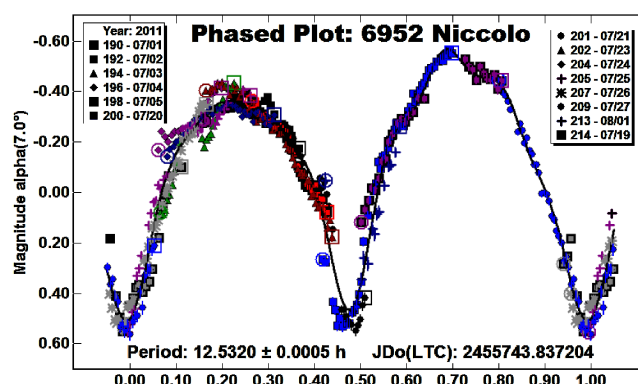
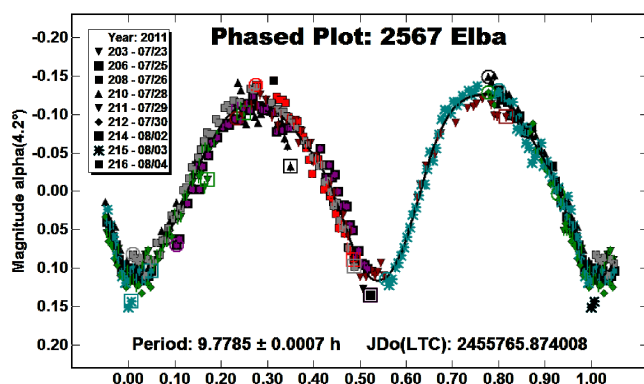




ASTEROID LIGHTCURVE ANALYSIS AT THE DANHENG OBSERVATORY APR – AUG 2011

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The lightcurves for three main-belt asteroids, 1413 Roucarie, 3385 Bronnina, and 39890 Bobstephens. All observations were taken from the DanHenge Observatory, one of 13 observatories at Goat Mountain Astronomical Research Station (GMARS - MPC G79).

Observations of asteroids 1413 Roucarie, 3385 Bronnina, and 39890 Bobstephens were made during the timeframe from 2011 April through 2011 August. The asteroids were selected from the list of asteroid photometry opportunities published on the Collaborative Asteroid Lightcurve Link (CALL) website (Warner et al. 2010), as well as a personal decision to work 39890 Bobstephens. A search of the Asteroid Lightcurve Database did not reveal previously reported results, hence all data and analysis is provided by the author.

All images for asteroids 1413 Roucarie and 3385 Bronnina were taken using a Meade 14-inch f/10 ACF OTA mounted on a Mathis Instruments MI-500F fork and an SBIG ST-9XE. All exposures were unbinned and unfiltered. Images for asteroid 39890 Bobstephens were taken with an SBIG ST-10XE on the same mount and OTA noted above. These exposures were binned 3x3

and unfiltered. Measurements and analysis were made using *MPO Canopus*, which employs differential aperture photometry to produce the raw data and incorporates the Fourier analysis algorithm (FALC) (Harris et al. 1989). Night-to-night calibration of the zero points was done using 2MASS magnitudes of five comparison stars of similar color to an asteroid. See Warner (2007) and Stephens (2008) for further discussion of this process that provides calibration of nightly zero points typically good to within ± 0.05 mag.

1413 Roucaurie. The findings for 1413 Roucaurie, comprised of 2 nights of observations on April 10th and April 30th with 124 data points, show the synodic period to be $6.357 \pm .001$ h and an amplitude of 0.50 ± 0.02 mag.

3385 Bronnina. For 3385 Bronnina, I had 3 nights of observations on April 10th, April 30th, and May 30th with 221 data points, resulting in a synodic period finding of $2.996 \pm .001$ h and an amplitude of $0.25 \pm .01$ mag.

39890 Bobstephens. The choice to work 39890 Bobstephens was a personal decision because Mr. Bob Stephens has been my mentor these past few years and has been instrumental in my success in the realm of astronomical science and the contributions that amateurs can make to the international community, and the inclusion of the results of my efforts on his asteroid in this edition is a proud moment in my early experiences in the field of asteroid photometry.

Also of note, this asteroid brightened to 18.6 mag during the timeframe the observations were made, which in and of itself, presented quite a challenge for a 14 inch OTA. In an effort to minimize the streaking effect during capture, exposures were limited to 5 minutes on an SBIG ST-10XE binned 3x3 and unfiltered. The findings, comprised of 5 nights of observations from July 29th through August 8th and consisting of 129 data points, show that the synodic period for 39890 Bobstephens is 9.55 ± 0.01 h with an amplitude of 0.20 ± 0.05 mag. These results were presented to Bob upon his return from Chile at the end of August. It was a great day!

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