

asked Dr. Pilcher to be my co-investigator. He accepted it and I wrote a proposal with his help. I turned it in to the amateur working group for the HST project. Unfortunately, I didn't get picked, as only a few amateurs were selected. The reason why my proposal was turned down was because it was then possible that Vesta's disk could be resolved using the adaptive optics on larger telescopes, which could compensate the atmospheric turbulence to discern tiny details.

I'm glad I had a chance to meet Dr. Fred Pilcher at the 2003 ALPO meeting in Boardman, Ohio. I didn't realize back then, but I do now, how much he helped spark my interest in first-class work in planetary science and other related fields. With Dr. Pilcher's encouragement, I hope other amateurs went through the same experience as I did. I learned a lot from Professor Pilcher. He's a great man and has certainly enriched many people who study minor planets. Without his encouragement, I wouldn't be sitting here and writing this perspective, thirty years later!

ASTEROIDS AT ETSCORN: 490 VERITAS, 3039 YANGEL, 5492 THOMA

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(Received: 13 September)

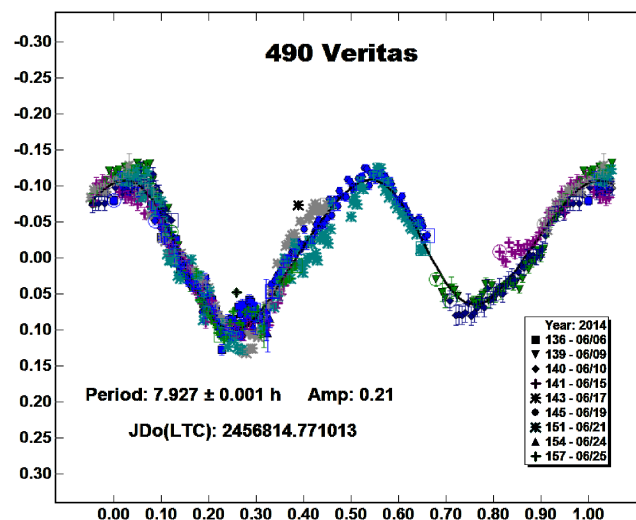
We present lightcurves and synodic periods for 3 asteroids. 490 Veritas is an inversion model candidate, while 3039 Yangel and 5492 Thoma are new determinations of synodic periods.

The observations of asteroid lightcurves were obtained at the Etscorn Campus Observatory (ECO, 2014) in Socorro, New Mexico. We used 3 Celestron 0.35-m SCT telescopes on Software Bisque Paramount ME mounts (SB, 2013). Two of the telescopes used SBIG STL 1001E CCDs that have 1024 x 1024 with 24 micron pixels. The third C-14 used a SBIG ST10xme with an Optic 0.5x focal reducer. The SBIG ST-10XME is binned 2x2 providing an image of 1092 by 736 13.6 with 13.6 micron pixels. The pixel size for the STL 1001E cameras is 1.25 arc seconds/pixel. This provides a 22 x 22 arc minute field of view. The ST-10 XME pixel size is 1.28 arc seconds/pixel. This provides a 20 x 16 arc minute field of view. The asteroid images were obtained through a clear filter. Exposure times varied between 3 and 5 minutes depending on the brightness of the object. Each evening a series of 11 dome flats were obtained and combined into a master flat with a median filter. The telescopes were controlled with Software Bisque's TheSky6 (SB, 2014) and the CCDs were controlled with CCDsoft V5 (SB, 2014). The images were dark subtracted and flat field corrected using image processing tools within MPO Canopus version 10.4.1.9 Warner (2014). The multi-night data sets for each asteroid were combined with the FALC routine (Harris et. al., 1989) within Canopus to provide synodic periods for each asteroid.

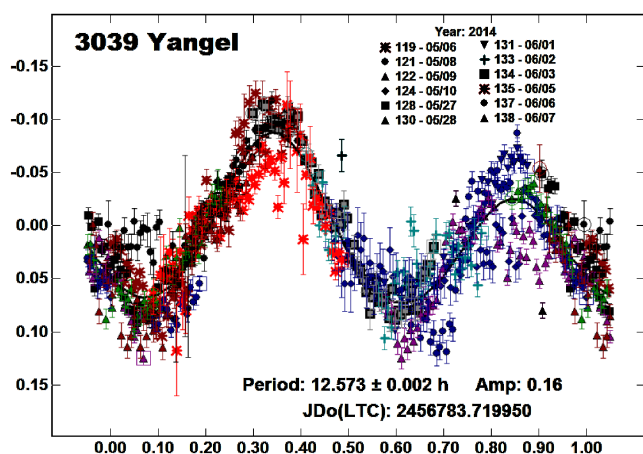
Observed Asteroids

490 Veritas is listed as Inversion Model Candidate by Warner et. el. (2014). Our efforts provide another solar bisector than previously observed. The second two asteroids, 3039 Yangel and 5492 Thoma were observed because they have no known synodic periods. Information about asteroid discovery dates and names were obtained for the JPL small bodies Database, JPLSDB (2014). The previously observed solar bisector phase angles were obtained from the lightcurve data base, LCDB, (Warner et.al. 2009).

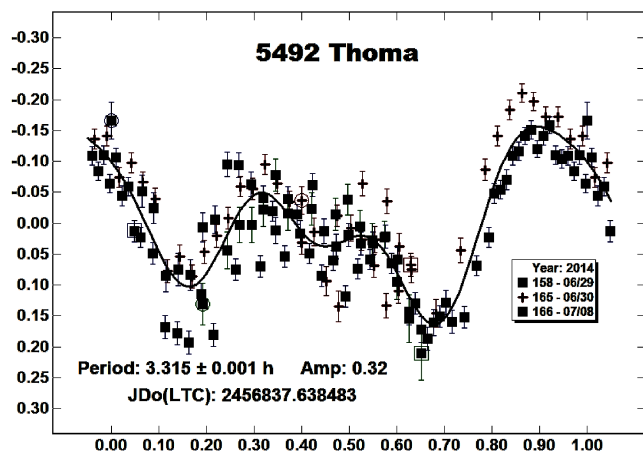
490 Veritas is a main-belt asteroid discovered by M. Wolf at Heidelberg on 1902 Sep 03. It is also known as 1902 JP. The LCDB (Warner et. al., 2009) reports 3 period determinations. Koff and Brincat, (2001) determined a period of 7.30 ± 0.005 h with an amplitude 0.33 mag. from data taken in February and March of 2001. The solar bisector angles (PABL, PABB) were 147.6 and -5.4. Behrend (2007) reported observations of Pierre Antonini which provide a period determination of 7.927 ± 0.002 h with an amplitude of 0.33 mag. from data taken in March 2007. The solar bisector angles (PABL, PABB) were 170.5 and -1.5. Gil-Hutton and Canada (2004) estimated the period to be 9.962 ± 0.004 h with an amplitude of 0.577 mag. There observation was obtained on only 3 nights and do not provide complete phase coverage. Their PABL, PABB were 188.3 and 2.5. We observed 490 Veritas on 9 nights between 2014 Jun 06 and 2014 Jun 25 and obtained a period of 7.927 ± 0.001 h with an amplitude of 0.21 mag. The solar bisector angles (PABL, PABB) were 256.7 and 11.1.



3039 Yangel is a main-belt asteroid discovered by L. Zhuravla at Nauchnyj on 1978 Sep 26. It is also known as 1978 SP2 and 1981 EP17. We observed 3039 Yangel on 12 nights between 2014 May 06 and 2014 Jun 07. While there is a fair amount of noise in the data we determined a period of 12.753 ± 0.002 h with an amplitude of 0.16 ± 0.07 mag.



5492 Thoma is a main-belt asteroid discovered by van Houten and Gehrels at Mt. Palomar on 1971 Mar 26. It is also known as 3227 T-1, 1959 TK, 1987 SM27 and 1987 UM8. We observed 5492 Thoma on 3 nights between 2014 Jun 29 and 2014 Jul 08. We estimate the period to be 3.315 ± 0.001 h with an amplitude of 0.32 ± 0.05 mag.



Acknowledgments

The Etscorn Campus Observatory operations are supported by the Research and Economic Development Office of New Mexico Institute of Mining and Technology (NMIMT). Student support at NMIMT is given by NASA EPSCoR grant NNX11AQ35A, the Department of Physics, and the Title IV of the Higher Education Act from the Department of Education.

References

- Behrend, R. (2007). http://obswww.unige.ch/~behrend/page_cou.html
- ECO (2014). Etscorn Campus Observatory <http://www.mro.nmt.edu/education-outreach/etscorn-campus-observatory>
- Gil-Hutton, R. and Canada, M. (2003). "Photometry of Fourteen Main Belt Asteroids." *Revista Mexicana de Astronomia y Astrofisica*, 39, 69-76
- Harris, A.W., Young, J.W., Bowell, E., Martin, L. J., Millis, R.L., Poutanen, M., Scaltriti, F., Zappala, V., Schober, H.J., Debehogne,

H., and Zeigler, K. (1989). "Photoelectric Observations of Asteroids 3, 24, 60, 261, and 863." *Icarus* 77, 171-186.

Koff, R.A. and Brincat, S.M. (2001), "Lightcurve Photometry of Asteroid 490 Veritas", *Minor Planet Bull.* 28, 67

SB, (2014). <http://www.bisque.com/sc/>

Warner, B.D., Harris, A.W., and Pravec, P. (2009). *Icarus* 202, 134-146. Updated 2014 September 7 <http://www.MinorPlanet.info/lightcurvedatabase.html>

Warner, B.D. (2014). <http://www.minorplanetobserver.com/MPOSoftware/MPOCanopus.htm>

Warner, B.D., Harris, A.W., Pravec, P., Durech, J., and Benner, L.A.M., (2014). "Lightcurve photometry Opportunities: 2014 January-March." *Minor Planet Bull.* 40, 134-136

A LIGHTCURVE FOR 788 HOHENSTEINA

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(Received: 13 September)

A lightcurve of 788 Hohenstenia was obtained from the Center for Solar System Studies during July and August 2014.

In late July 2014, a request for observations of 788 Hohenstenia was announced by Raoul Behrend. A group of European observers had been observing Hohenstenia and described several eclipse events. Their lightcurve (Behrend, 2014) was phased to a rotational period of 47.856 h and showed two "events" where the magnitude of the asteroid dropped 0.2 mag. over the course of a few minutes. These observing sessions each ended with the event and did not show a corresponding brightening of the asteroid.

Coley started observations on 25 July using a 0.35-m SCT with a SBIG ST-9XE CCD camera. When that telescope was taken offline for maintenance, Stephens continued observations starting on August 1 with a 0.4-m SCT and an FLI-1001E CCD camera. All images were unbinned with no filter and had master flats and darks applied to the science frames prior to measurement. Measurements were made using *MPO Canopus*, which employs differential aperture photometry to produce the raw data. Period analysis was done using *MPO Canopus*, which incorporates the Fourier analysis algorithm (FALC) developed by Harris *et al.*, (1989). Night-to-night calibration of the data (generally $< \pm 0.05$ mag) was done using field stars converted to approximate Cousins V magnitudes based on 2MASS J-K colors (Warner, 2007). The