

THE MINOR PLANET BULLETIN

BULLETIN OF THE MINOR PLANETS SECTION OF THE
ASSOCIATION OF LUNAR AND PLANETARY OBSERVERS

VOLUME 30, NUMBER 1, A.D. 2003 JANUARY-MARCH

1.

PHOTOMETRY OF 430 HYBRIS, 798 RUTH, 1264 LETABA, AND 3786 YAMADA

Robert D. Stephens
11355 Mount Johnson Court
Rancho Cucamonga, CA 91737 USA
rstephens@foxandstephens.com

(Received: 28 September)

Results for the following asteroids (lightcurve period and amplitude) observed from Santana Observatory during the period July – September 2002 are reported: 430 Hybris (7.205 ± 0.01 hours and 0.60 ± 0.04 mag.), 798 Ruth (8.53 ± 0.01 hours and 0.45 ± 0.04 mag.), 1264 Letaba (32.16 ± 0.03 hours and 0.20 ± 0.03 mag.), 3786 Yamada (4.034 ± 0.01 hours and 0.70 ± 0.02 mag.).

Santana Observatory (MPC Code 646) is located in Rancho Cucamonga, California at an elevation of 400 meters and is operated by Robert D. Stephens. Details of the equipment used can be found in Stephens (2002) and at the author's web site.

Some of the asteroids were selected from the "CALL" web site "List of Potential Lightcurve Targets" (Warner 2000). Others were selected based upon their position in the sky. Aperture photometry was performed using the software program "Canopus" developed by Brian Warner and including the Fourier analysis routine developed by Alan Harris (Harris et al., 1989). This program allows combining data from different observers and adjusting the zero points to compensate for different equipment and comparison stars. All observations were unfiltered. Dark frames and flat fields were used to calibrate the images. The Canopus text file output for each of the results can be found at the author's web site.

430 Hybris

430 Hybris is a main-belt asteroid discovered December 18, 1897 by A. Charlois. It is named for the personification of insolent justice in Greek mythology. One hundred fifty five observations over four sessions between August 7 and 12, 2002 used to derive the rotational period of 7.205 ± 0.01 hours with an amplitude of 0.60 ± 0.04 magnitude. This observing run spans 17 rotations.

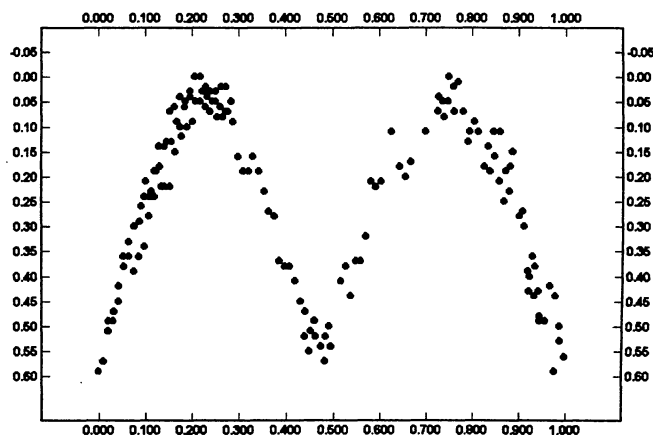


Figure 1. Lightcurve of 430 Hybris based upon a derived period of 7.205 ± 0.01 hours. Zero phase corresponds to JD 2452498.820554 (corrected for light-time)

798 Ruth

798 Ruth is a main-belt asteroid discovered November 21, 1914 by M. Wolf at Heidelberg. It is possibly named for the biblical heroine in the Old Testament. Two-hundred-and-one observations over five sessions were obtained between August 13 and 17, 2002. This time frame spans 11 rotations. The rotational period was

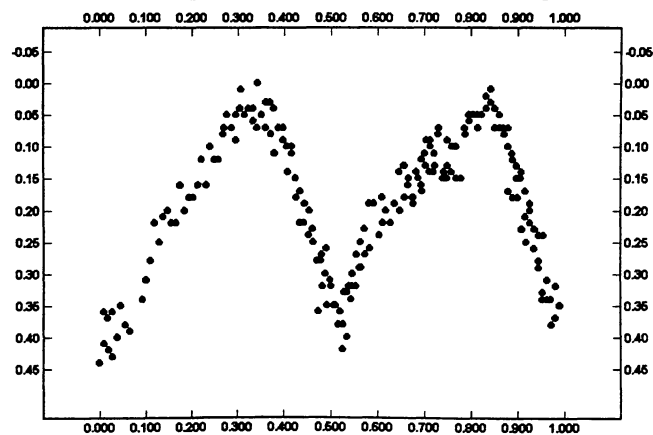


Figure 2. Lightcurve of 798 Ruth based upon a derived period of 8.53 ± 0.01 hours. Zero phase corresponds to JD 2452499.865715 (corrected for light-time)

derived to be 8.53 ± 0.01 hours with an amplitude of 0.45 ± 0.04 magnitude.

1264 Letaba

1264 Letaba is a main-belt asteroid discovered April 21, 1933 by C. Jackson at Johannesburg. It is named for a river in Transvaal, South Africa. Letaba was a very difficult target to resolve due to its long rotational period and low amplitude. Eventually, 594 observations over 11 sessions between August 26 and September 20, 2002 were used to derive the rotational period of 32.16 ± 0.03 hours with an amplitude of 0.20 ± 0.03 magnitude. This covered 11 rotations of the asteroid.

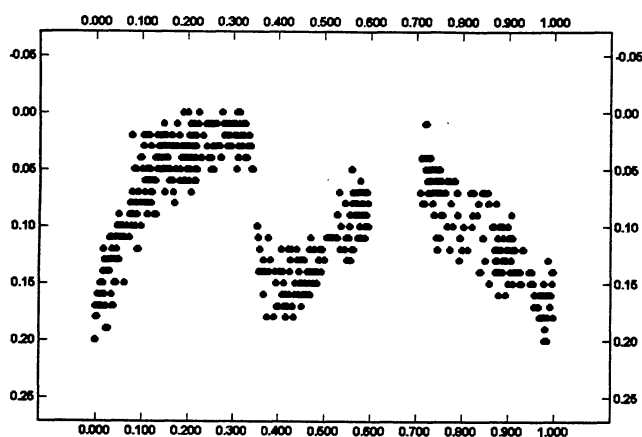


Figure 3. Lightcurve of 1264 Letaba based upon a derived period of 32.16 ± 0.03 hours. Zero phase corresponds to JD 2452514.743996 (corrected for light-time)

3786 Yamada

3786 Yamada is a main-belt asteroid discovered by T. Kojima on January 10, 1988 at Chiyoda. It is named in memory of Sakao Yamada (1918-1986), an outstanding Japanese engineer who devoted his life to the research and development of aspherical optics. Ninety-three observations over three sessions between July 29 and August 2, 2002 were used to derive the rotational period of 4.034 ± 0.01 hours with an amplitude of 0.70 ± 0.02 magnitude. This three day observing run covered 18 rotations of the asteroid.

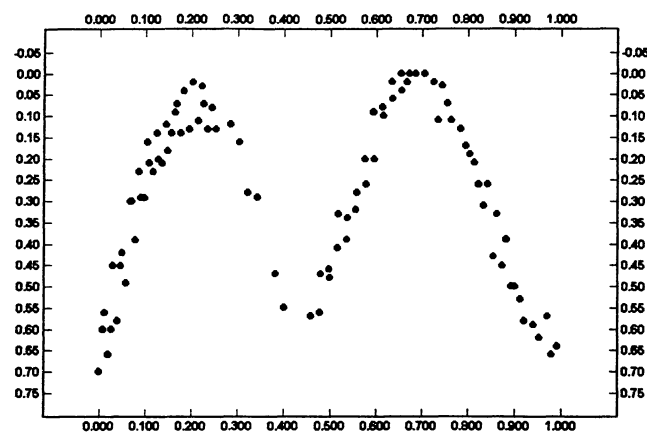


Figure 4. Lightcurve of 3786 Yamada based upon a derived period of 4.034 ± 0.01 hours. Zero phase corresponds to JD 2452485.768808 (corrected for light-time)

Acknowledgements

Many thanks to Brian Warner for his continuing work and enhancements to the software program "Canopus" which makes it possible for amateur astronomers to analyze and collaborate on asteroid rotational period projects and for maintaining the CALL Web site which helps coordinate collaborative projects between amateur astronomers. Also, thanks to Brian Warner for his assistance in determining the period of 1264 Letaba as he first spotted the 32 hour solution.

References

- 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. W. (1989). "Photoelectric Observations of Asteroids 3, 40, 60, 261, and 863." *Icarus* **77**, 171-186.
- Stephens, R. D. (2002). "Photometry of 873 Aralia, 1189 Terentia, 1040 Klumpkea, and 1998 Titius". *The Minor Planet Bulletin*, **29**(3), 47-48.
- Stephens, R. D. (2002). <http://home.earthlink.net/~rdstephens/default.htm>.
- Warner, B. (2002). "Potential Lightcurve Targets". <http://www.minorplanetobserver.com/astlc.targets>.