ASTEROID LIGHTCURVE RESULTS FROM MENKE OBSERVATORY

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Lightcurves for the following asteroids are reported: 295 Theresia, 463 Lola, 605 Juvisia, 656 Beagle, 691 Lehigh, 885 Ulrike, 899 Jokaste, 931 Whittemora, 1116 Catronia, 1120 Cannonia, 1185 Nikko, 2463 Sterpin, 2647 Sova, 4649 Sumoto, 6475 Refugium, (27496) 2000 GC125, and (42600) 1997 YF10.

The asteroid program at Menke Observatory has been described elsewhere (Menke 2005, this issue). In brief, we use a C11 with an ST7E camera in an automated setup. The data are taken and the images are read using MaximDL to create text files of raw intensity values using a digital reference star plugin. These files are imported into Excel where the data are analyzed. The period is determined by inspection using a data folding process. Night to night calibration is done using a modified Landolt star reference process and/or manual offsets. The data are not light-time corrected. Virtually all targets were taken from the CALL web site lists (Warner 2005).

The results are presented in the table below. The lightcurve plots show data session dates as DXMMDDYY where X is our session number. Where appropriate, comments are provided on the individual results.

463 Lola. Note that very similar results were recently published by Bembrick (2005). These data were submitted to Aericibo in support of their radar work on this object.

605 Juvisia. I note that data sets D10 and D11 were supplied by another person whose name regretfully has been lost.

691 Lehigh. These data were taken under poor weather conditions and show substantial noise. While the derived period of 10.482 hr appears valid, an alternative period of 10.592 hr is not ruled out.

899 Jokaste. After the initial submission of this paper, the MPB editor noted that there was another paper by Don Pray that was pending, and that included different Jokaste data. At the editor's request, Don Pray and I combined the Pray data (7 sessions) from Jan-Feb 2005 with our data from Dec. 2003 (3 sessions). Using the combined data, we were able to determine the period with the high precision as noted in the results table. For clarity, the graph shows the Pray data as a single data series because there are relatively few points per session.

1116 Catronia. These data are relative only.

1185 Nikko. Very similar period results were recently published by Stephens (2005); however, the shape of the curve reported here is substantially different. We could find no explanation for the anomalous portion of the curve between phase=0.40-.55. Such a feature does not appear in the Stephens data taken in Nov. 2004, nor did it appear on the preceding or following sessions in this campaign (each of which covered about 1.5 full rotations).

(27496) 2000 GC125. These data were taken in 12/02-01/03 without calibration. The amplitude was small and the data noisy; however our analysis showed a period of 4.712hr. Petr Pravec kindly offered to review the data, and verified a period of 4.7097+/-0.0005 hr. which we have used.

(42600) 1997 YF10. These data are relative magnitude only.

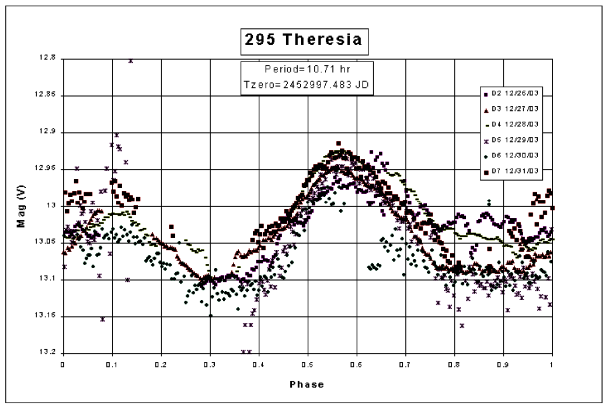
References

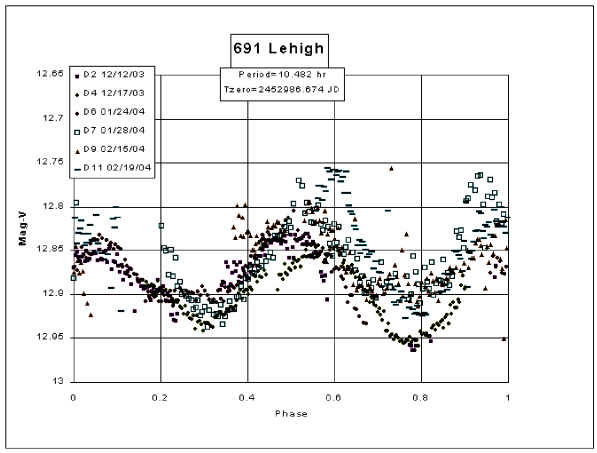
Bembrick, C. (2005). "Period Determination for 463 Lola." *MPB* **32**, 25.

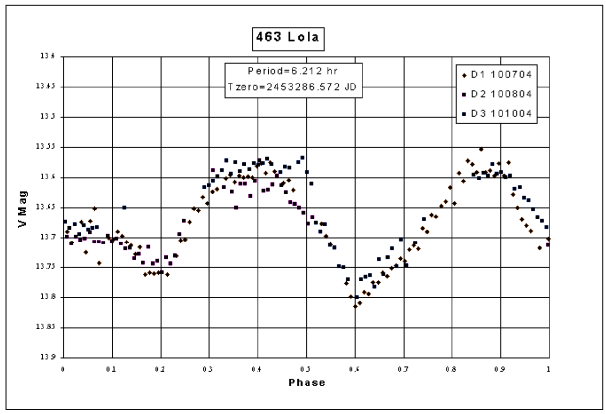
Stephens, R. D. (2005). "Rotational Periods of 743 Eugenisis, 995 Sternberga, 1185 Nikko, 2892 Filipenko, 3144 Brosche, and 3220 Murayama. *MPB* **32**, 27.

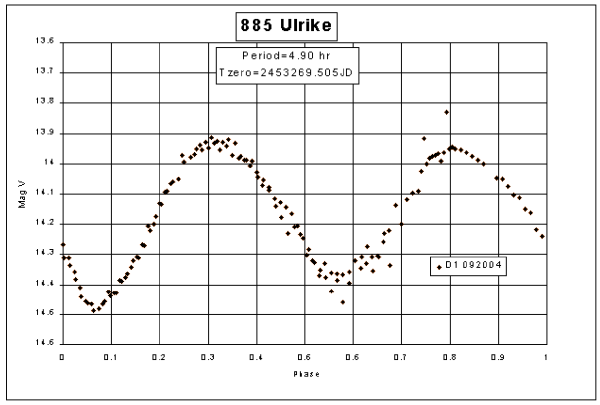
CALL website supported by Brian Warner. http://www.minorplanetobserver.com

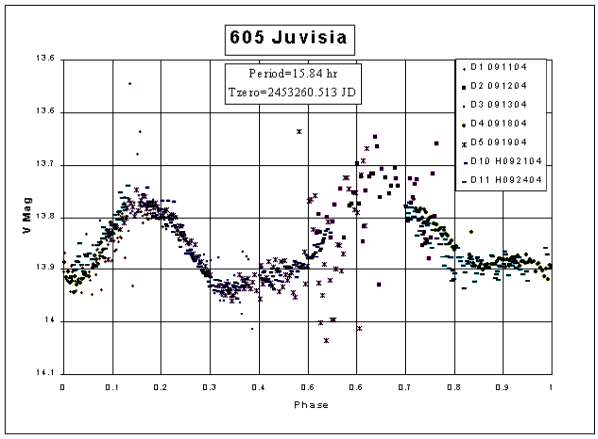
Number	Name	Period(hr)	Unc	Amp	Unc	DateStart	DateEnd	DateSpan	Sessions
295	Theresia	10.71	0.02	0.15	0.04	12/23/03	12/30/03	8	6
463	Lola	6.212	0.005	0.2	0.02	10/07/04	10/10/04	4	3
605	Juvisia	15.85	0.02	0.24	0.03	09/11/04	09/24/04	14	7
656	Beagle	7.035	0.003	1.2	0.1	04/15/04	04/18/04	4	3
691	Lehigh	10.482	0.003	0.12	0.02	12/12/03	02/19/04	68	6
885	Ulrike	4.90	0.05	0.55	0.05	09/20/04	09/20/04	1	1
899	Jokaste	6.2510	0.0002	0.25	0.05	12/02/03	02/27/05	446	10
931	Whittemora	19.20	0.01	0.2	0.05	01/07/04	01/13/04	7	4
1116	Catronia	8.83	0.01	0.09	0.02	12/06/03	12/16/03	11	3
1120	Cannonia	3.816	0.002	0.16	0.03	11/07/04	11/08/04	2	2
1185	Nikko	3.788	0.003	0.5	0.05	01/23/05	01/28/05	6	3
2463	Sterpin	15.40	0.01	0.3	0.05	12/24/04	02/10/05	47	5
2647	Sova	9.38	0.01	0.35	0.05	01/30/05	02/01/05	2	3
4649	Sumoto	26.31	0.01	0.3	0.05	12/10/04	01/01/05	22	6
6475	Refugium	8.01	0.01	0.45	0.05	11/09/04	11/11/04	3	2
27496	2000 GC125	4.7097	0.0005	0.10	0.03	12/22/02	01/12/03	21	5
42600	1997 YF10	7.771	0.001	0.9	0.1	01/08/05	01/28/05	21	6

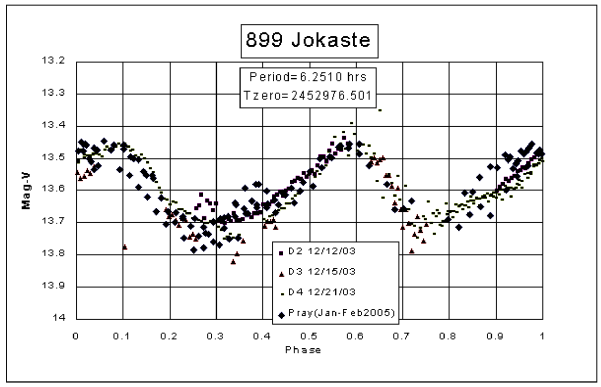


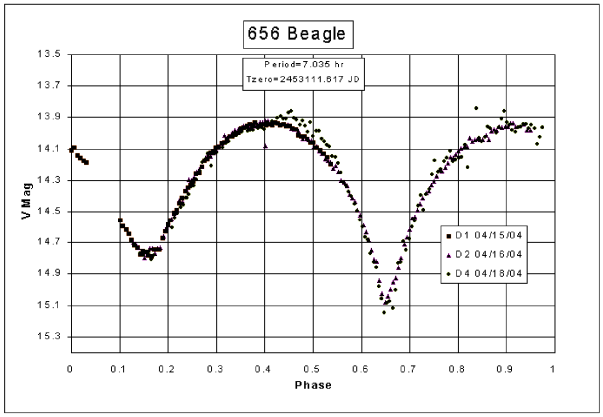


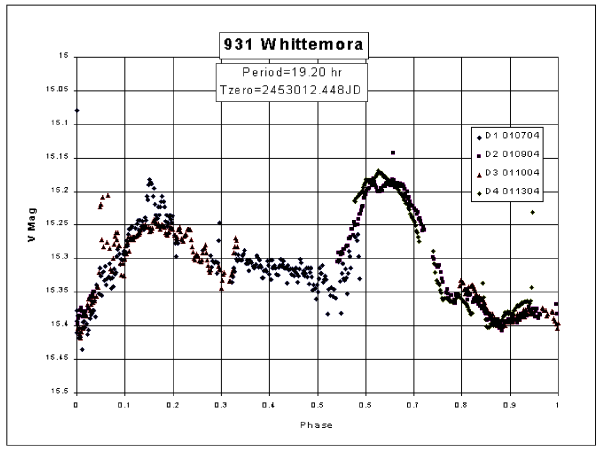


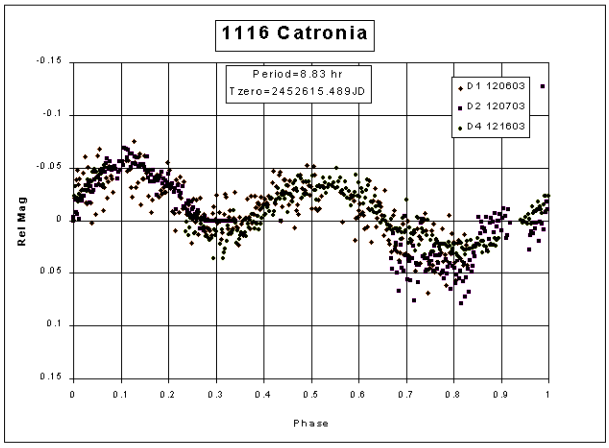


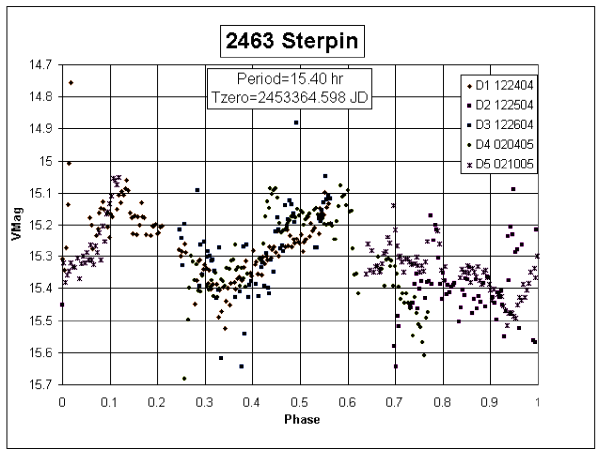


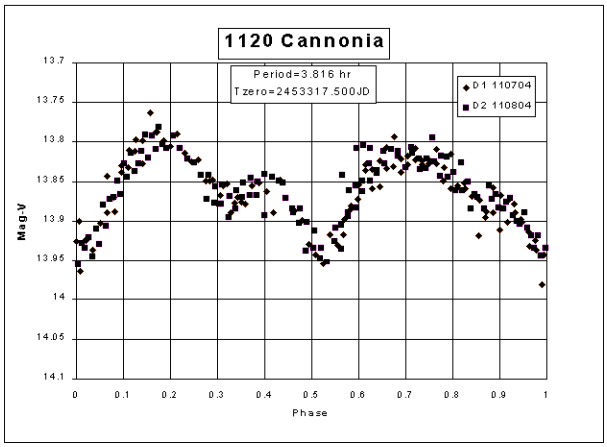


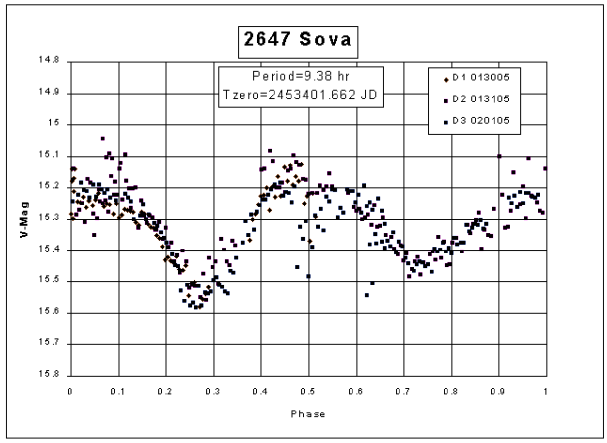


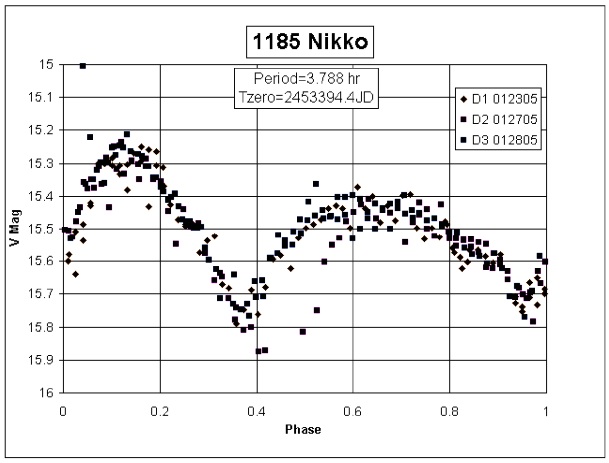


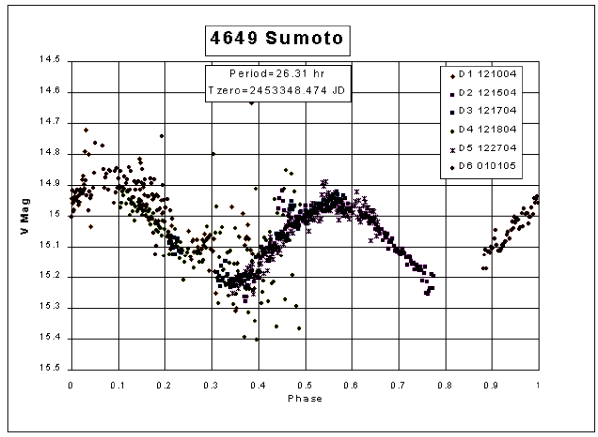


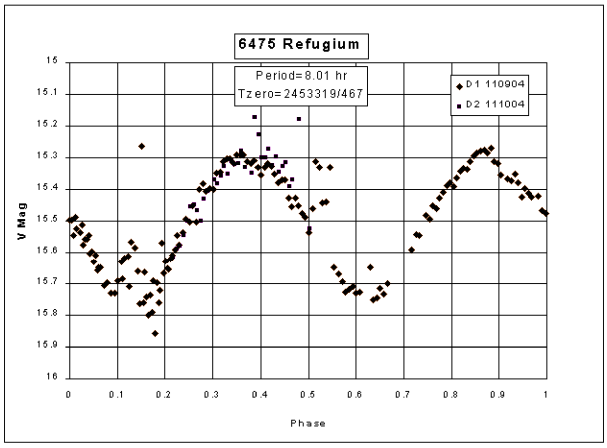


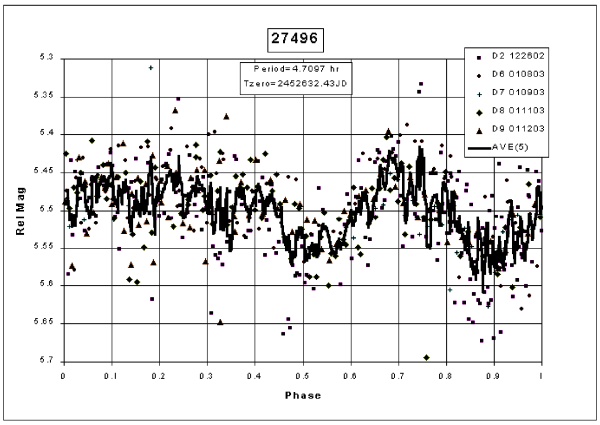


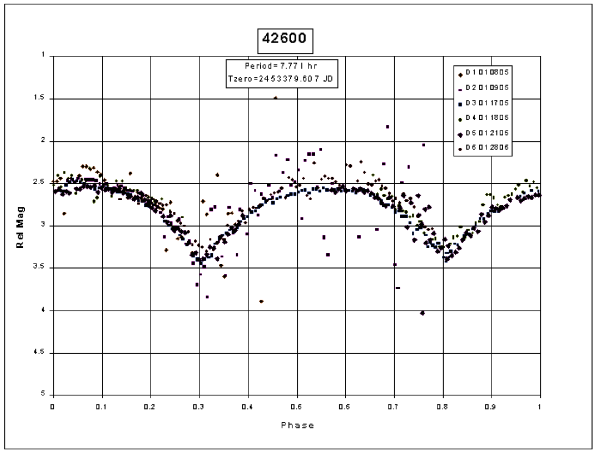












PROBABLE BINARY 3220 MURAYAMA

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Lightcurve observations made from three stations during 2004 Nov.7 to Dec.17 have revealed that 3220 Murayama is a probable binary asteroid. Primary's rotation period: 4.8595±0.0011 hr, amplitude: 0.13-0.15 mag. Secondary-to-primary mean diameter ratio: 0.4 The orbital period is unclear.

Yanagida Astronomical Observatory, MPC Code 417, is in the Noto peninsula, which is located in central Japan facing the Sea of Japan. The observatory utilizes a 0.6m, f/6 Ritchy-Chretien telescope with a Mutoh CCD camera. Co-observatories are Miyasaka Observatory, MPC Code 366, which utilizes a 0.36m f/8 Ritchy-Chretien telescope with a SBIG STL-1001E CCD, and Hamanowa Astronomical Observatory, MPC Code D91, which utilizes a 0.4m f/4.5 Newton telescope with a SBIG ST-8 CCD. All images were taken using an R-band filter. The images were measured with IRAF. The period analysis was done with cyclocode, developed by B. Dermawan (2003).

The lightcurve of 3220 Murayama was previously reported by Stephens (2005). He observed Murayama during Oct.15 to Oct.18 2004. He reported that its rotational period was 4.87 ± 0.01 hour and amplitude was 0.16 magnitude. Its lightcurve did not seem to be a binary system. However our lightcurve observations during 2004 Nov.7 to Dec.17 have revealed this minor planet is a probable binary asteroid.

Figure 1 is the lightcurve of Murayama. It includes all data, and the period is set to 4.8595 hr. Figures 2 and 3 are the short-period components. They are the primary's rotational lightcurve, derived from the original data by rejecting the deep extinction. The long-period lightcurve components are caused by occultation/eclipse events in the binary system. They are derived from the original data by subtracting the short-period component of each month. The data of Nov. 29 are included in both the November and the December analysis. Figure 4 shows that the only observed occultation event was in November. Figure 5 shows there were both occultation and eclipse observed events in December. All data are corrected for light-time. Zero phase is equal to 2453318.88332 JD. Because the orbital period is unclear, it is not possible to be certain of the long-period lightcurve components. We need more lightcurve observations to determine the orbital period. The next opposition of Murayama occurs in April 2006.