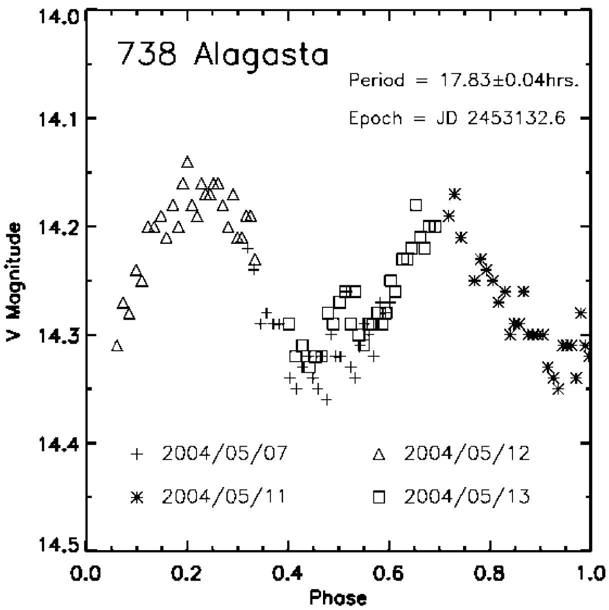

Figure 2: Composite lightcurve of asteroid 738 Alagasta derived from 111 observations and a 17.83-hour rotation period.

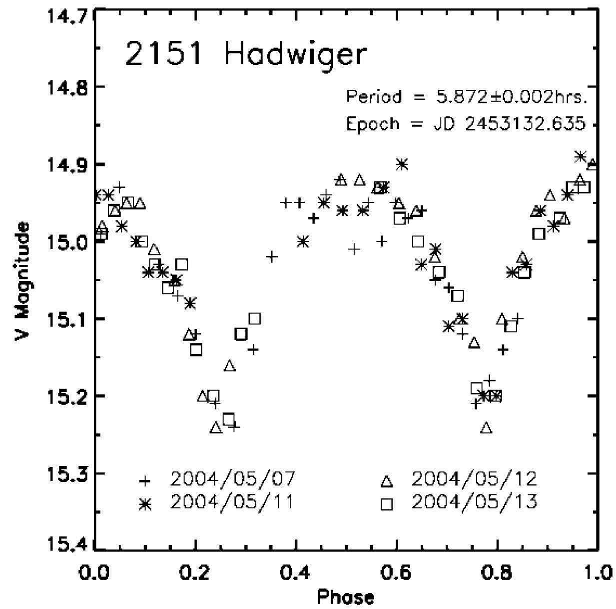

Figure 3: Composite lightcurve of asteroid 2151 Hadwiger derived from 105 observations and a 5.872-hour rotation period.

LIGHTCURVES AND PERIODS FOR ASTEROIDS 2103 LAVERNA AND 3445 PINSON

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Two asteroids were selected from the CALL list for asteroids with unknown periods. Data were obtained on 8 nights between March 30 and April 8, 2005. The period and amplitude results are: 2103 Laverna 9.249 ± 0.003 hr, 0.27 mag; 3445 Pinson 7.801 ± 0.002 hr, 0.37 mag. Laverna shows a bump on the second rising branch of its bimodal light curve while Pinson exhibits a more or less symmetrical bimodal lightcurve.

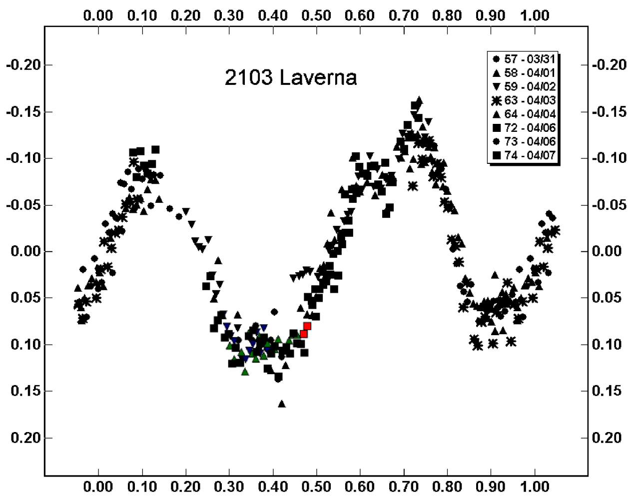
Here we report lightcurve observations of asteroids 2103 Laverna and 3445 Pinson made at the Frank T. Etscorn Campus observatory of New Mexico Tech using a Celestron C-14 and SBIG ST-8e CCD camera system mounted on a Bisque Paramount ME. We obtained all of our images through a Bessel-R filter. All of the exposures for 2103 Laverna were 120 seconds long. For 3445 Pinson we used 120 seconds for all but the last night when we switched to 180 seconds for a better signal-to-noise ratio. The telescope was controlled by Software Bisque's "*TheSky*" version 5 and the CCD was controlled by their "*CcdSoft*" version 5. The CCD was cooled to -15°C and automatic dark subtraction was used. On each night, a series of 11 dome flats was obtained using a tungsten-halogen lamp pointed at the opposite wall. These 11 images were median combined using IDL procedures as described in Jamieson and Klinglesmith (2004). These nightly master flats were combined at the end of the 10 night run to create a master flat that was used to flat field correct all the images for the final data analysis.

Both of these asteroids were moving slowly enough that a whole night's data (up to 6 hours) could be reduced in one session using the same comparison stars. Two methods were used to independently analyze the differential lightcurves. The first method used aperture photometry on the asteroid and all stars brighter than the asteroid. These stars' instrumental magnitudes were median combined and subtracted from the asteroid's instrumental magnitude to produce the differential lightcurve. The second method used MPO *Canopus* published by BDW Publishing, and used up to 5 comparison stars per night (session). The final periods were determined using the Fourier method from MPO Canopus. Standard light-time corrections were applied to the UT dates and times of the observations.

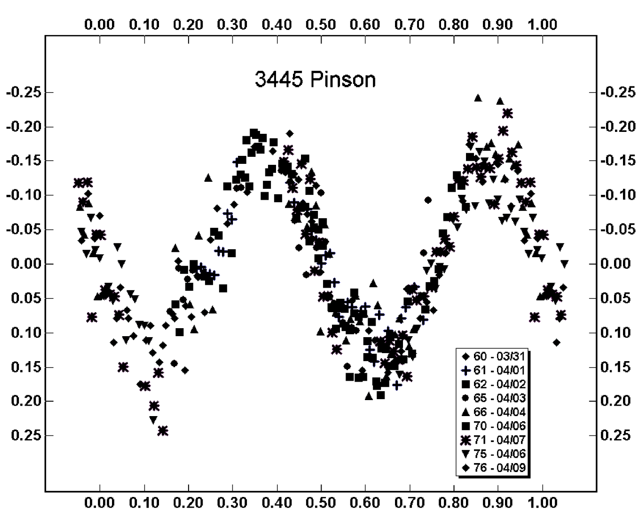
Our observing run lasted from UT March 30, 2005 through April 8, 2005. We were clouded out one night and winds were too high on another. The table below shows the UT dates of our observations, the number of images obtained for each asteroid for each night and the time interval (hr) of the observations. Assuming that our periods are correct, 2103 Laverna was observed for ~ 19 cycles and 3445 Pinson was observed for ~28 cycles.

UT date	2103 Laverna	3445 Pinson	time interval
04/01/2005	19	19	3.9hrs
04/02/2005	42	41	4.0
04/02/2005	57	56	4.9
04/03/2005	52	53	4.7
04/04/2005	80	79	6.5
04/04/2005	78	79	6.3
04/07/2005	71	70	5.8
04/09/2005	0	49	7.1

2103 Laverna. Laverna was discovered March 21, 1960 at the La Plata Observatory. We determined a bimodal period of 9.249 ± 0.003 hours with an amplitude of ~0.27 magnitudes in the Bessel-R filter. There is a sight dip of approximately 0.04 magnitude at phase 0.65 This dip helps rule out any other aliased period. The Julian date of zero phase is 2453460.636065, light-time corrected.



3445 Pinson. Pinson was discovered in 1983. This lightcurve was more challenging since several aliased periods presented themselves. We have chosen the bimodal period of 7.801 ± 0.002 hours with an amplitude of 0.37 magnitudes as the most probable period. This is based mainly on the fact that large amplitudes would be improbable for monomodal, trimodal or quadramodal lightcurves (Pravec 2005). The Julian date of zero phase is 2453460.638898, light-time corrected.



References

Jamieson, Q. and Klinglesmith, D.A. (2004). "Period Determination of asteroids 1508 Kemi and 5036 Tuttle", *MPB* **31**, 38-39.

Pravec, P., Private communication, 2005

ROSE-HULMAN SPRING 2005 LIGHTCURVE RESULTS: 155 SCYLLA, 590 TOMYRIS, 1655 COMAS SOLÁ, 2058 ROKA, 6379 VRBA, AND (25934) 2001 DC74

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CCD images recorded in March and April 2005 using the Tenagra Observatory 32-inch telescope yielded lightcurve periods and amplitudes for five asteroids: 155 Scylla 7.958 ± 0.002 h, 0.20 mag; 590 Tomyris 5.55 ± 0.05 h, 0.93 mag; 1655 Comas Solá 20.4 ± 0.1 h, 0.20 mag; 2058 Roka 10.09 ± 0.01 h, 0.50 mag; 6379 Vrba 5.11 ± 0.01 h, 0.36 mag; (25934) 2001 DC74 19.1 ± 0.05 h, 0.90 mag. Additionally, 12 targets listed herein were found to have too low a lightcurve amplitude after one night to continue following.

Nine undergraduate students from Rose-Hulman Institute of Technology (Addleman, Covele, Duncan, Johnson, Kramb, LeCrone, Reichert, Starnes, and Twarek) and two professors (Ditteon and Kirkpatrick) obtained images of asteroids during the spring of 2005. They used the commercial 32" Ritchey-Chretien telescope with a V-filter at the Tenagra Observatory in Arizona by submitting requests via FTP and downloading the resulting images via FTP. The telescope operates at f/7 with a CCD camera using a 1024x1024x24 μm SITe chip and the images were binned 2 by 2 (Schwartz, 2004). All exposures were taken for 60 seconds. They also used three 14" Celestron telescopes on Paramount mounts at the Oakley Observatory in Terre Haute, Indiana. The telescopes operate at f/7 with two Apogee AP7 and one Apogee AP8 cameras. The AP7s have 512x511x24 μm SITe chips, one of which uses a V-filter, and the AP8 has a 1024x1024x24 μm SITe chip. These exposures were 240 seconds for each image.

Asteroids for observation were selected by using *TheSky* software by Software Bisque. Only asteroids that were located between 20° and 30° in elevation at one hour after local sunset and with brightness between 14 and 16 mag were considered. The elevation requirement ensured that the asteroid would be high enough in the sky to avoid excessive airmass throughout the night. The asteroids were limited to the 14th magnitude because we pay for a minimum 60 seconds for each exposure, and brighter asteroids would saturate the CCD camera. Dimmer asteroids would require a longer exposure at a greater expense. The asteroids were then checked on a list of asteroid lightcurve parameters by Alan Harris (Harris, 2003). We tried to observe