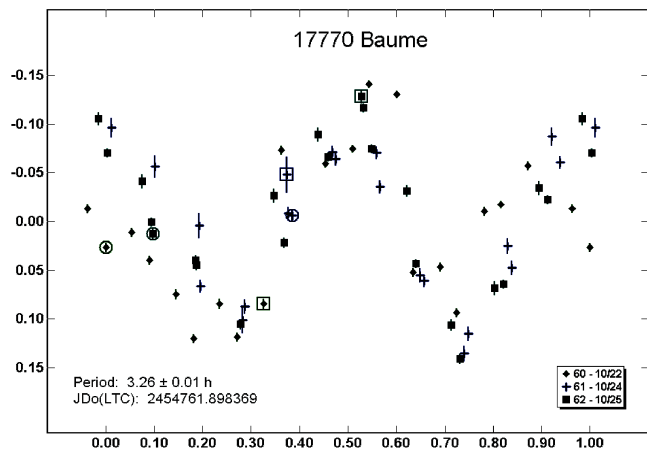
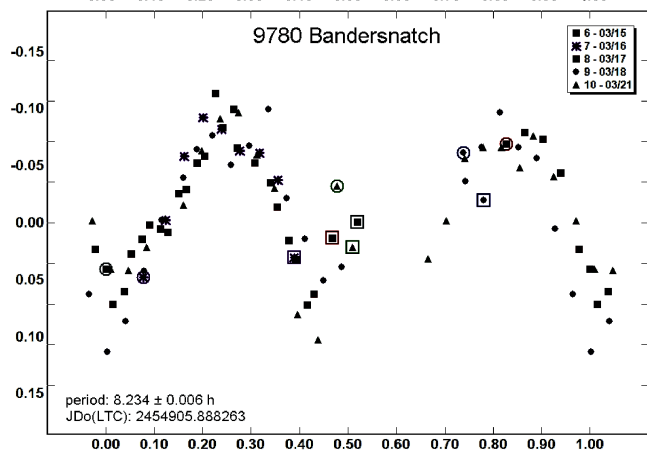
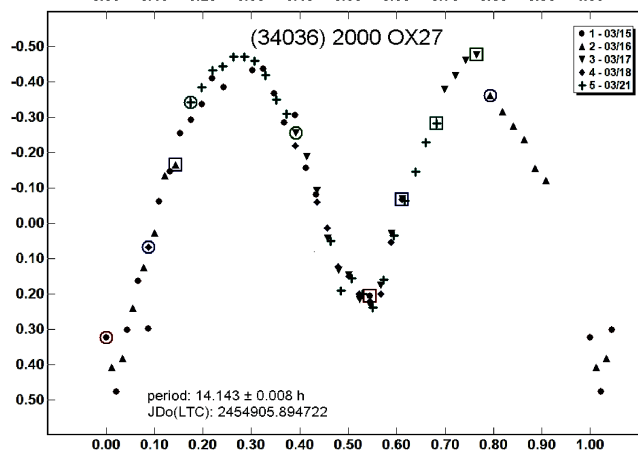
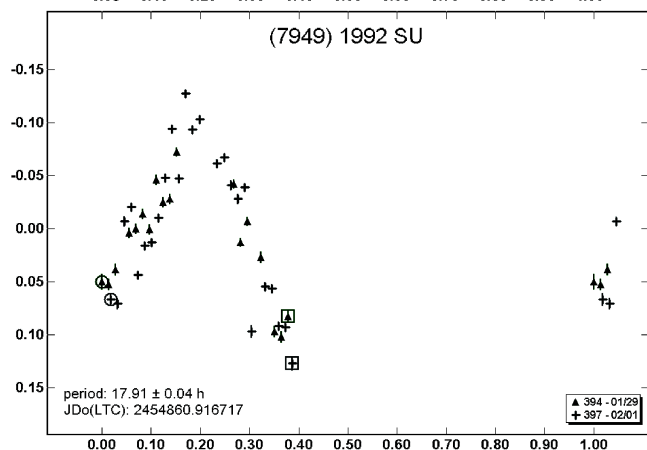
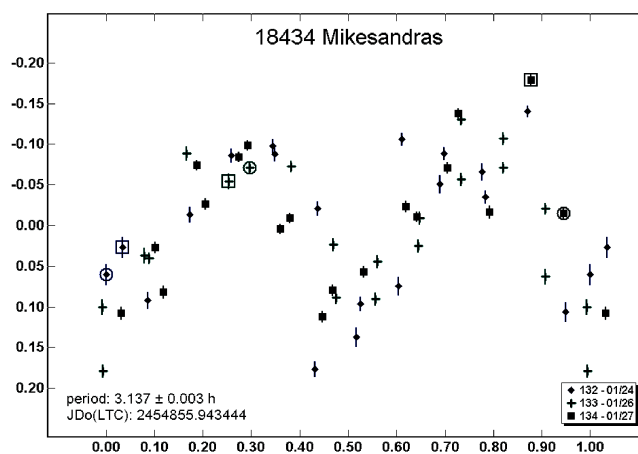
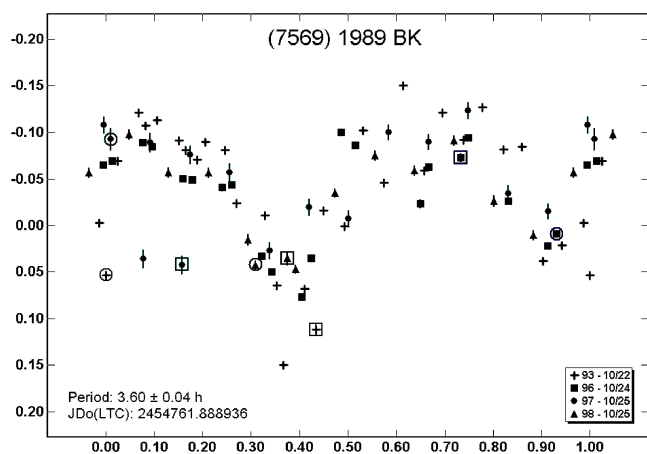




ASTEROIDS OBSERVED FROM GMARS AND SANTANA OBSERVATORIES – APRIL TO MAY 2009

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Lightcurve period and amplitude results from Santana and GMARS Observatories for 2009 April to May are reported: 362 Havnia, 16.92 ± 0.01 h, 0.40 mag; 470 Kila, 290 ± 5 h, 0.26 mag; (93768) 2000 WN22, 2.6814 ± 0.0001 h, 0.30 mag.

The author operates telescopes at two observatories. Santana Observatory (MPC 646) is located in Rancho Cucamonga, CA, and GMARS (Goat Mountain Astronomical Research Station, MPC 79) is located at the Riverside Astronomical Society's observing site in Landers, CA. Details of the equipment are in Stephens (2006). All of the targets were chosen from the list of asteroid photometry opportunities published on the Collaborative Asteroid Lightcurve Link website (CALL; Warner et al., 2009). Images were measured using *MPO Canopus*, which employs differential aperture photometry to produce the raw data. Period analysis was done using *Canopus*, which incorporates the Fourier analysis algorithm (FALC) developed by Harris (1989).

362 Havnia. All images were acquired using the 0.30-m Schmidt-Cassegrain (SCT) at Santana Observatory with an SBIG STL-1001 CCD camera. Harris and Young (1980) observed Havnia on three nights in 1978 December under poor photometric conditions and reported a period of 18 ± 0.1 h. The period of 16.92 ± 0.01 h found here differs significantly from that previous result.

470 Kilia. Behrend (2009) analyzed observations from 2009 March and reported a period of 2.496 h and amplitude of ~ 0.02 mag. However, the scatter of within the data set was far greater than the reported amplitude for the partial lightcurve. The data obtained by the author were linked to an internal standard using a method developed by Warner (2007) and described by Stephens (2008) that is included in the latest release of *Canopus*. The asteroid displayed some evidence of non-principal axis of rotation. However, the scatter in the nightly calibrations is at the limit of accuracy of the internal standards (~ 0.05 mag.) and so it was not possible to find a definitive secondary period. Images on April 22, 25, 25 and May 16 and 17 were acquired using the 0.35-m SCT at GMARS with an SBIG STL-1001 CCD camera. All other images were acquired using the 0.30-m SCT at Santana Observatory.

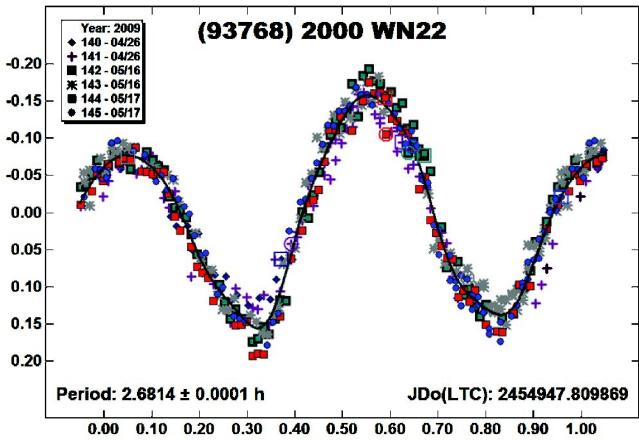
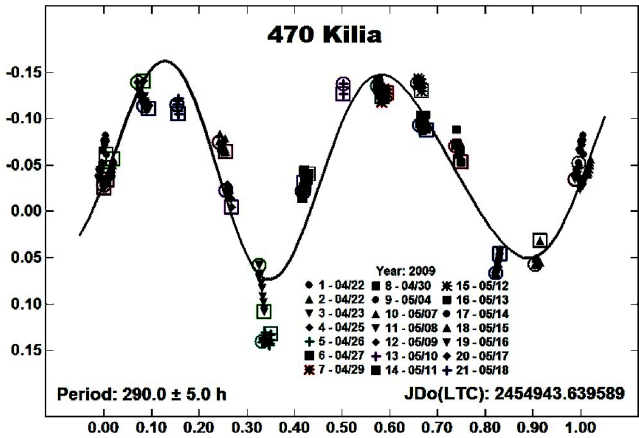
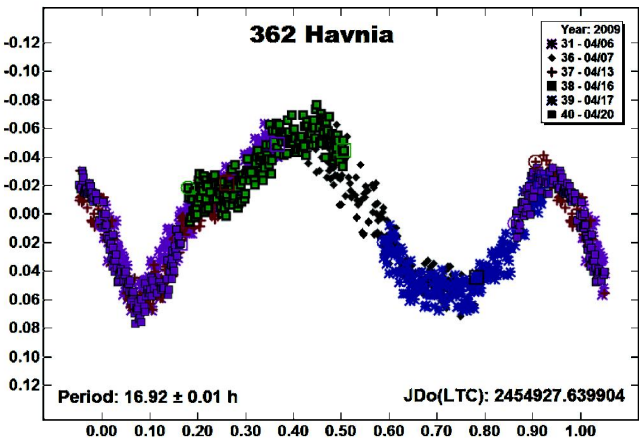
(93768) 2000 WN22. All images were acquired using the 0.35-m SCT at GMARS.

Acknowledgements

Thanks are given to Dr. Alan Harris of the Space Science Institute, Boulder, CO, and Dr. Petr Pravec of the Astronomical Institute, Czech Republic, for their ongoing support of amateur asteroid research. Also, thanks to Brian Warner for his continuing work and enhancements to the software program *MPO 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.

	362 Havnia	470 Kila	(93768) 2000 WN22
Dates	04/06-04/20	04/22-05/18	04/26-05/17
Data Pts	1,203	2,043	430
Phase ang	5.3, 11.0	14.7, 23.4	16.4, 15.4
Avg L_{PAB}	185	187	220
Avg B_{PAB}	3	4	15
Per (h)	16.92	290	2.6814
PE (h)	0.01	5	0.0001
Amp (mag)	0.11	0.26	0.30
AE (mag)	0.03	0.05	0.02

Table I. Observing circumstances. Dates are in 2009.



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