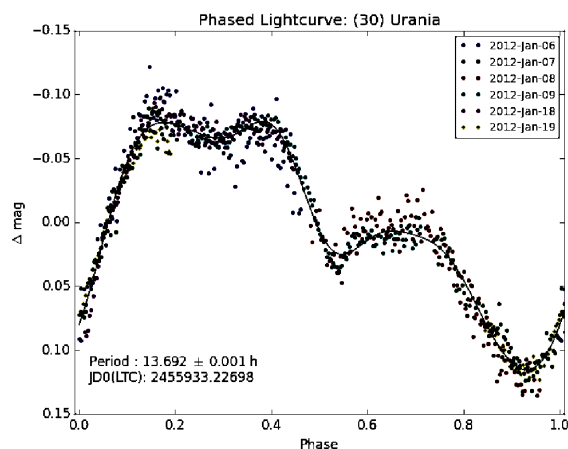


on 2012 January 19, an event predicted to be visible from central to east Europe (Kretlow, 2011) although the circumstances were not very favorable. Unfortunately, mainly due to bad weather over Europe that time, no occultation observations was reported.

Small Automated Telescope for Internet Observations (SATINO) is a project established by the first author. SATINO 1 and SATINO 2 are remotely operated telescopes with 20-cm and 30-cm aperture, located on the Observatoire de Haute-Provence (OHP) site at Haute-Provence, France, about 100 km north-east of Marseille. Image acquisition was made with an SBIG ST-8 dual-chip CCD camera attached to the SATINO 2 telescope with focal reducer. This gave a scale of 2.1 arcsec/pixel with 2 x 2 binning. No filters were used. Exposure time was 300 seconds on the first night and 120 seconds for all subsequent nights. All images were measured using *MiraPro*. Dark and flat images were applied.



Period analysis was done with a Python/SciPy script developed by the second author. Magnitudes were reduced to unity distance and times were corrected for light-time. The period was calculated by a non-linear least squares fit of an n -order Fourier series (in this case $n = 6$) to the observations, similar to the well-known FALC algorithm developed by Harris (Harris *et al.*, 1989).

We obtained a synodic rotational period $P = 13.692 \pm 0.001$ h with an amplitude $A = 0.19$ mag from this lightcurve. The period agrees with the values given in the literature and databases (Warner, 2015).

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ETSCORN OBSERVATORY LIGHTCURVE RESULTS FOR ASTEROIDS 2245, 3759, 6388, 214088

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Four asteroids were observed at Etscorn Observatory from 2014 December to 2015 January. The results from analysis are all new determinations of synodic periods and amplitudes

Observations of four asteroids were obtained at the Etscorn Campus Observatory (ECO, 2015) with our three Celestron 0.35-m Schmidt-Cassegrain telescopes (SCT) on Software Bisque (SB) Paramount ME mounts (SB, 2015). The telescopes were controlled with *TheSky6* (SB, 2015) and the CCDs were controlled with *CCDSofit v5* (SB, 2015).

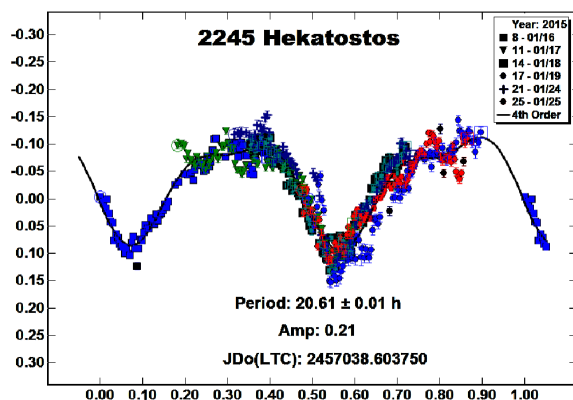
Two of the telescopes used an SBIG STL-1001E CCD camera with a pixel array of 1024x1024x24-microns. This produced a field-of-view of 22x22 arc minutes and scale of 1.25 arc sec/pixel. The third telescope used an SBIG ST10XME with an Optec 0.5x focal reducer. The ST10XME was binned 2x2 providing an image of 1092x736x13.6-micron pixels. This gave a scale of 1.28 arc sec/pixel and field-of-view of 20x16 arc minutes.

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 was obtained and combined into a master flat with a median filter. The images were dark-frame and flat-field corrected using image processing tools within *MPO Canopus v10.4.7.6* (Warner, 2015a). The multi-night data sets for each asteroid were combined with the FALC routine (Harris *et al.*, 1989) within *MPO Canopus* to provide synodic periods for each asteroid.

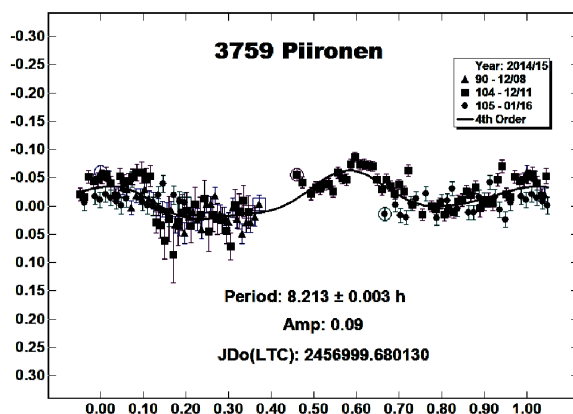
Observed Asteroids

The information about the discovery and names was obtained from the JPL Small Body Database Search Engine (JPL, 2015). 2245 Hekatos, 3759 Piironen, and (6388) 1989 WL1 are new determinations of synodic periods and amplitudes. 214088 has also been observed by Pravec *et al.* (2014) and Warner (2015b)

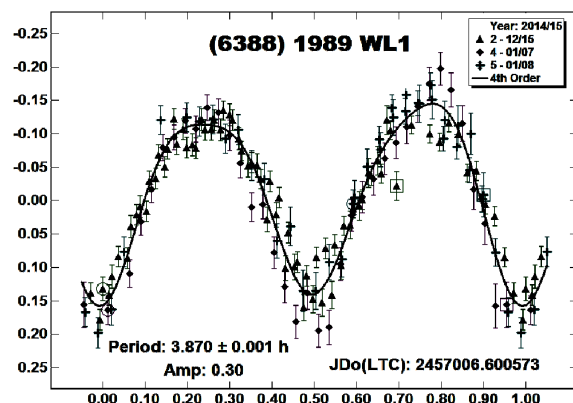
2245 Hekatos is a main-belt asteroid discovered by L.I. Chernykh at Crimean Astrophysical Observatory on 1968 Jan 24. It is also known as 1968 BC, 1930 FA, 1958 XC, 1966 QV, and 1971 XC. We observed it on six nights between 2015 Jan 16-25. We obtained a synodic period of $20.61 \text{ h} \pm 0.01 \text{ h}$ with an amplitude of 0.21 mag.



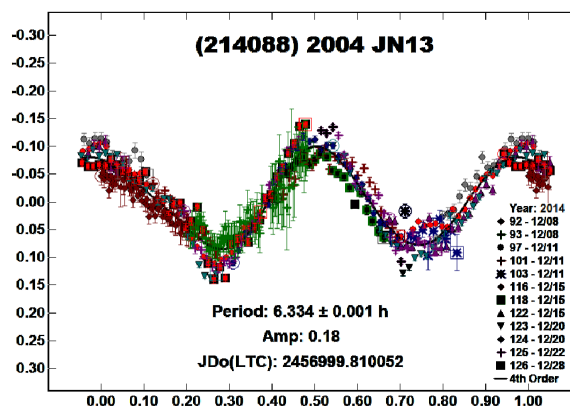
3759 Piironen is a main-belt asteroid discovered on 1984 Jan 8 by E. Bowell at the Anderson Mesa Station of Lowell Observatory, Flagstaff, AZ. It is also known as 1984 AP. We observed it on three nights between 2014 Dec 8-16. Despite the noisy data, a synodic period of 8.213 ± 0.003 h with an amplitude of 0.09 mag. was determined.



(6388) 1989 WL₁ is a main-belt asteroid discovered by A. Ueda and H. Kaneda at Kushiro on 1989 Nov 24. It is also known as 1954 VW₂, 1972 TZ₅, and 1993 UK₃. We observed it on three nights between 2014 Dec 15 and 2015 Jan 8. We obtained a synodic period of 3.870 ± 0.001 h with an amplitude of 0.30 mag.



(214088) 2004 JN₁₃ is a main-belt asteroid discovered by Linear at Socorro, New Mexico USA. It is also known as 1975 XA. We observed it on six nights between 2014 Dec 8-28. We obtained a period of 6.334 ± 0.001 h with an amplitude of 0.18 mag. It has also been observed by Pravec *et al.* (2014) and Warner (2015b). Pravec *et al.* determined a period of 6.342 ± 0.005 h and amplitude of 0.40 mag. Warner obtained periods of 6.336 ± 0.005 and 6.33 ± 0.01 with amplitudes of 0.20 mag. and 0.17 mag.



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