

THO

Pro-Amateur Observatories as a Significant Resource for Professional Astronomers – Taurus Hill Observatory

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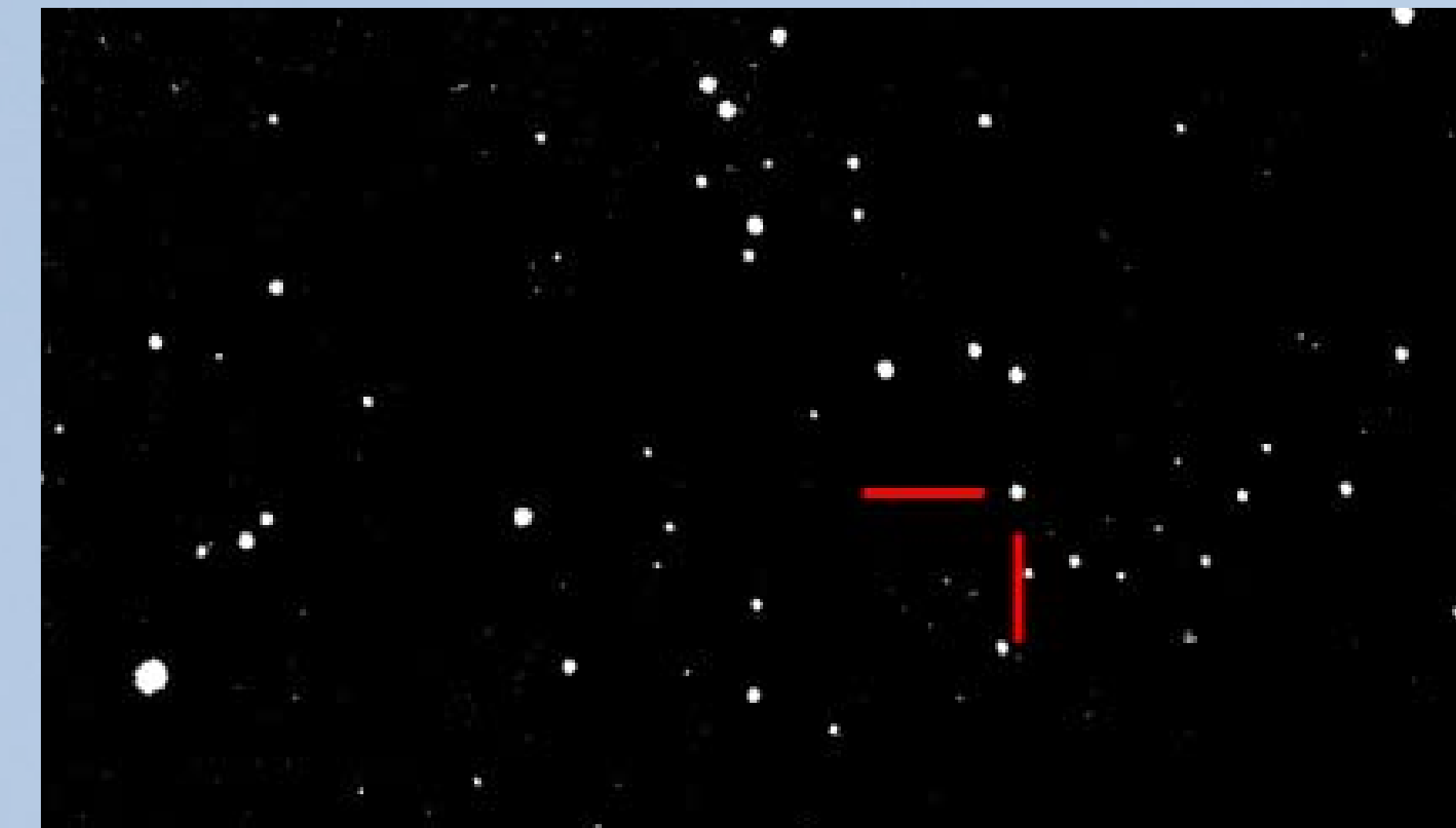
<http://www.taurushill.net>

Taurus Hill Observatory (THO), observatory code A95, is an amateur observatory located in Varkaus, Finland. The observatory is maintained by the local astronomical association Warkauden Kassiopeia.

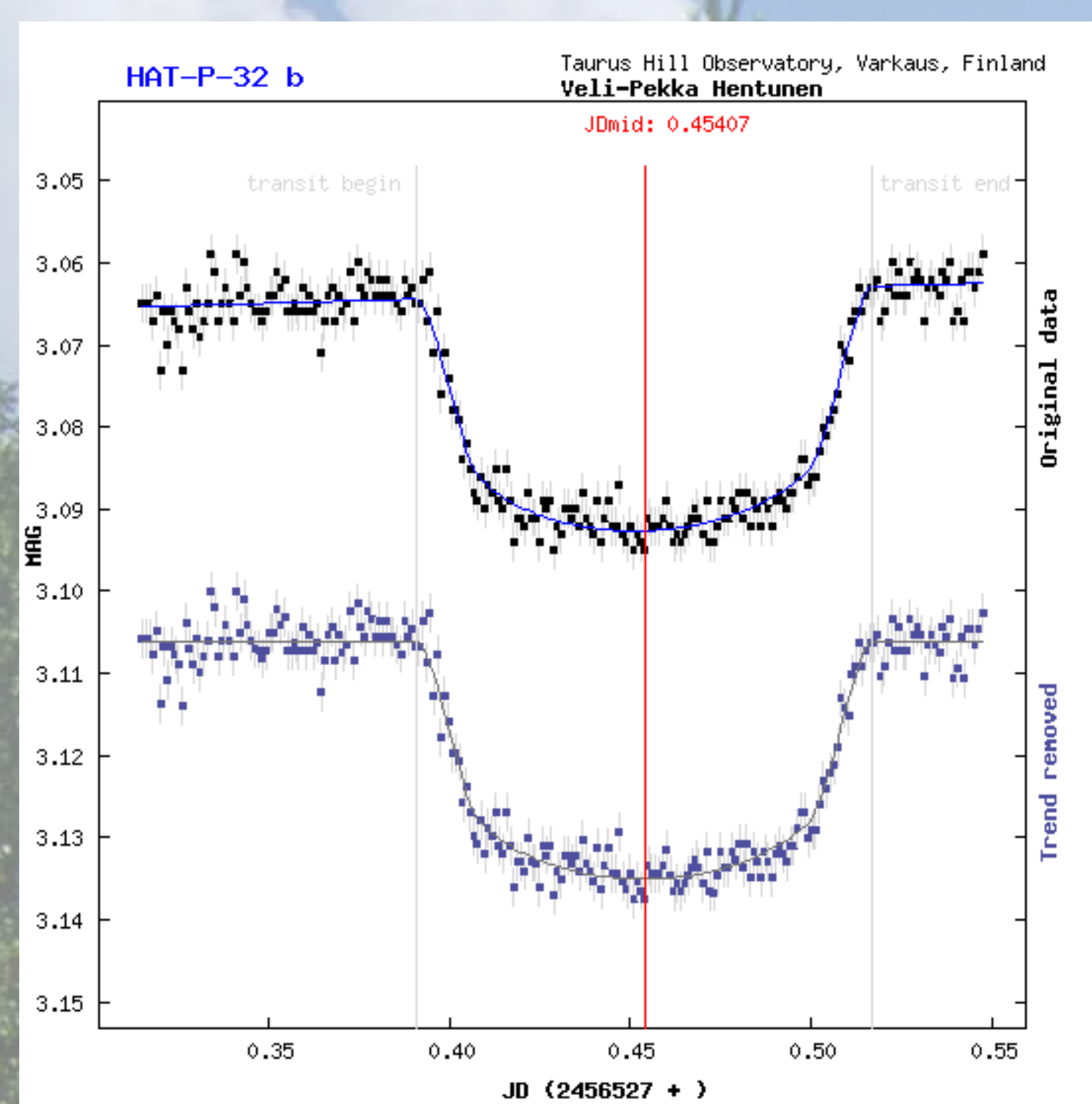
THO research team has observed and measured various stellar objects and phenomena. Observatory has mainly focused on asteroid [1] and exoplanet light curve measurements, observing the gamma rays burst, supernova discoveries and monitoring [2]. We also do long term monitoring projects [3]. THO research team has presented its research work on previous EPSC meetings [4], [5], [6] and [7] and got very supportive reactions from the European planetary science community.

OJ287 Observation Campaign 2006 - 2008

OJ287 was observed at THO from December 2006 to October 2008 about 50 times. The measurements were made normally once a week according to the prevailing weather conditions. The target was usually imaged with the exposures of 300 or 600 seconds through the photometric R-filter and on each observation night 3 - 6 times. In photometric measurements THO research team used the finding chart and the brightness list of the check stars which are listed on the project pages of OJ287: www.astro.utu.fi/OJ287MMVI/. The observation results were submitted to Dr. Kari Nilsson from Tuorla Observatory. We usually achieved brightness precision of 0.01 magnitudes. Our results were in harmony with the measurements done by others around the world. Also, THO's measurements of OJ287 measurements were used in the article that was published in Nature, April 2008 [2].



OJ287 is an Active Galactic Nuclei (AGN) that is located about 4,3 billion light years from Earth. There has been a variation in the brightness of the OJ287 in 12 years cycle. Photo: V.-P. Hentunen and M. Nissinen.



HAT-P-32 b observed at THO 22.8.2013 by V.-P. Hentunen.

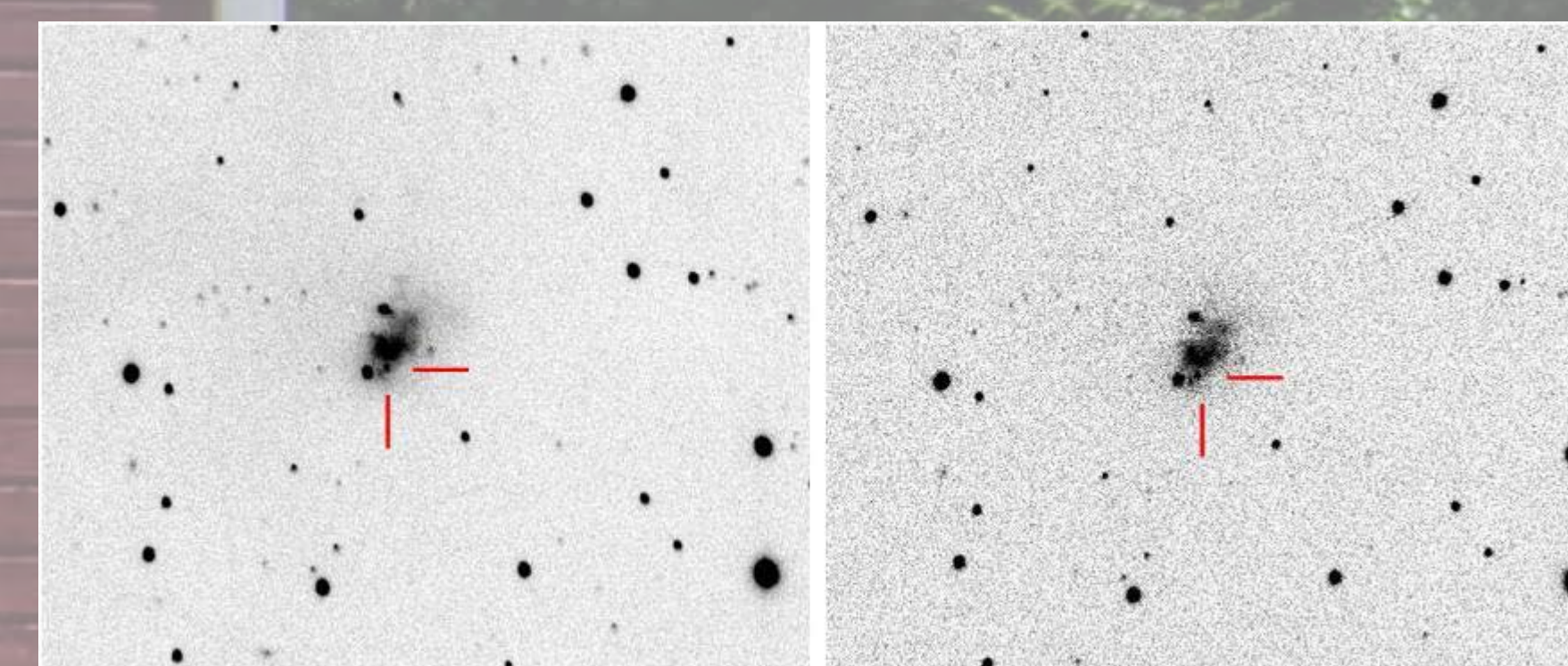
Transit Observations of Exoplanets

Exoplanets have been one of the specialties of the THO research team in Finland. The team has made for now many years transit and light curve measurements about the exoplanets. To this date the team has measured over 40 different exoplanet light curves, some of them several times. The first THO measurements have been added to AXA-database is maintained by Bruce L. Gary and now observatory is mainly using EDT maintained by Variable Star and Exoplanet of Czech Astronomical Society. Some of the measurements have been send to the Pulkovo Observatory (Russia) for further analysis.

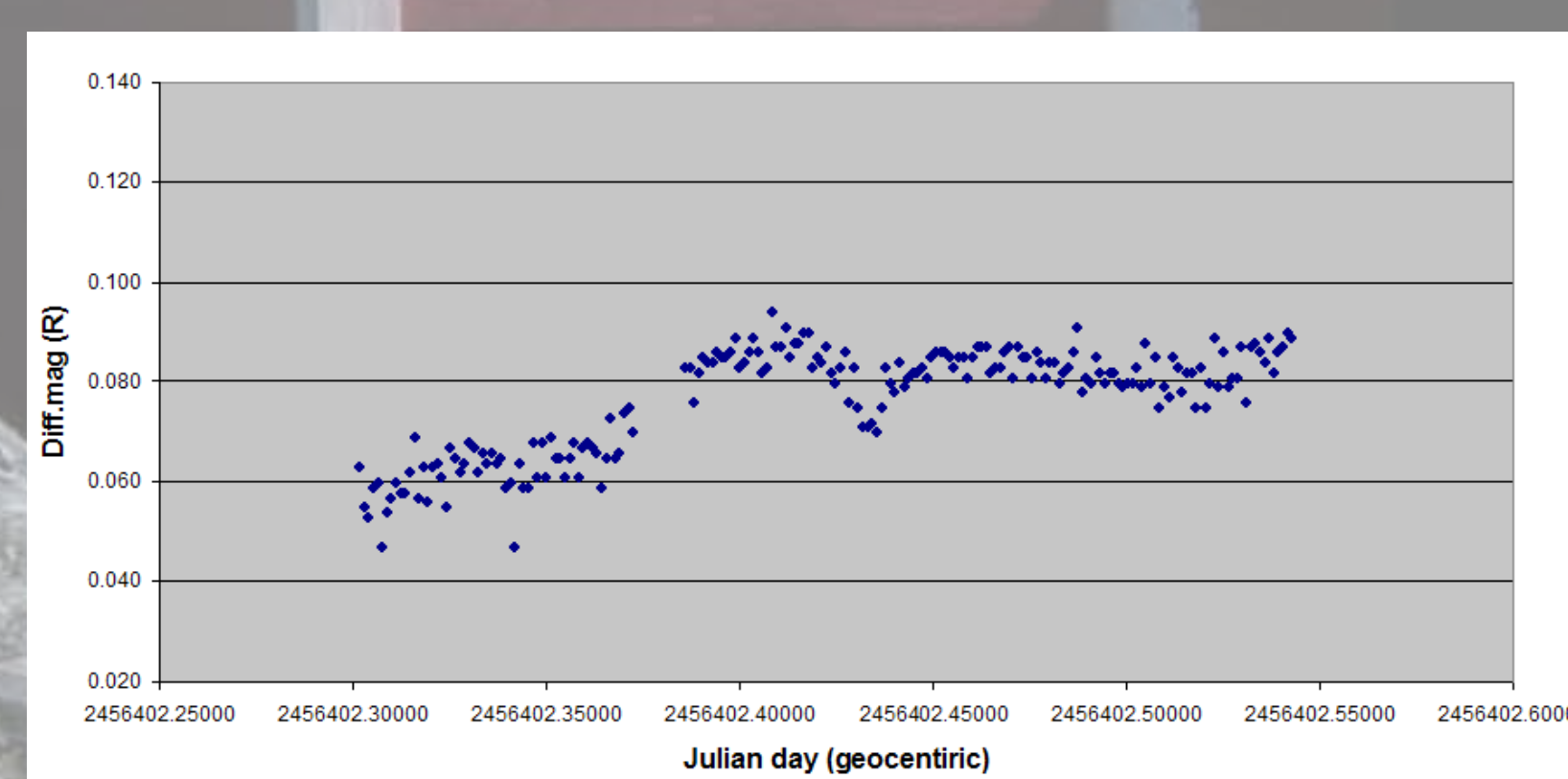
THO site is optimal place in Finland to observe and measure transits and light curves during the winter due the lack of the light pollution. This gives the observatory possibility to have long measurement periods during these dark winter months.

Supernovae Discoveries and Monitoring

THO has been the most active supernovae observer in Finland. The observatory research team has discovered eighth new supernovae from the northern part of the sky. Observatory has also monitored few interesting supernovae. For example, the measurements of the supernova SN 2008ha were used in the Nature article [3] published in June 2009.



Supernova SN 2008ha imaged at THO. On the left 28.11.2008 18:06 and on the right 28.11.2008 18:37. Both images are unfiltered 4x300 sec.



Asteroid 22 Kalliope light curve measured at THO 19./20.4.2013.

Asteroid Light Curve Measurements

The Taurus Hill Observatory research team has measured dozens of light curves of different asteroids at THO since 2006. Because the rotation period of an asteroid is often 5 - 10 hours this usually means that the measurements take all night. Because of the quite fast relative motion of asteroids the exposure time must be short, about one minute. However, this is usual-

ly enough when using photometric R-filter since the brightness of the objects are between 11 and 13 magnitudes. Some of our measurements were submitted to Dr. Johanna Torppa who analyzed them. Her doctoral thesis "*Light curve inversion for asteroid spins and shapes*" [1], was accepted in December 2007 and THO asteroid measurements were part of the thesis.

THO has also made asteroid observation for the Pulkovo Observatory (Russia). One of them is 22 Kalliope that was observed at THO April 2013. Pulkovo Observatory is interested in multiply asteroids. These asteroids have unique "zik-zak" -shape of light curve that is also clearly visible in THO measurements.

More information about the Taurus Hill Observatory research

If You would like to get more information about the research work made at the THO, please visit our website in the address <http://www.taurushill.net>. We recommend that You also visit the Transitsearch (<http://www.transitsearch.org/>) and AXA (<http://brucegary.net/AXA/x.htm>) websites. We are grateful to the Finnish Meteorological Institute who sponsored this poster.

Poster design: Harri Haukka

Background image: Jari Juutilainen



References

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