Transit Observations in Taurus Hill Observatory

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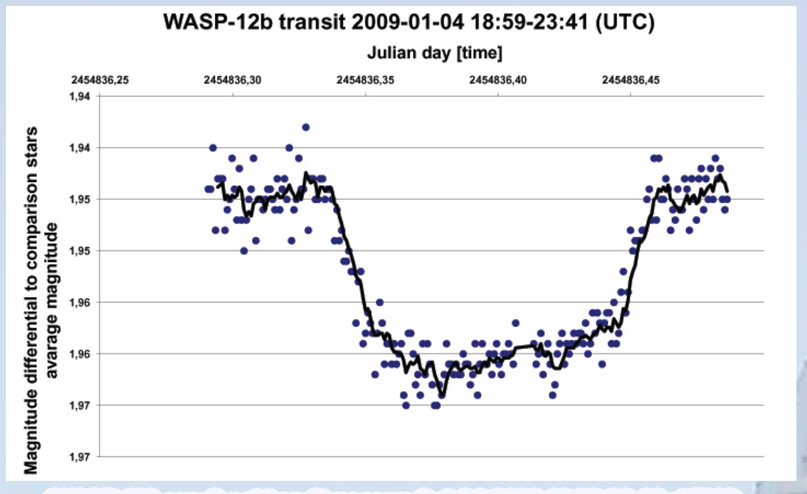
Taurus Hill Observatory (THO), observatory code A95, is an amateur observatory located in Varkaus, Finland. The observatory is maintained by the local astronomical association Warkauden Kassiopeia.

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] and [6] and got very supportive reactions from the European planetary science community.



WASP-12b exoplanet transit measured at 4.2.2009 18:59-23:41 at THO.

Transit Observations of Exoplanets

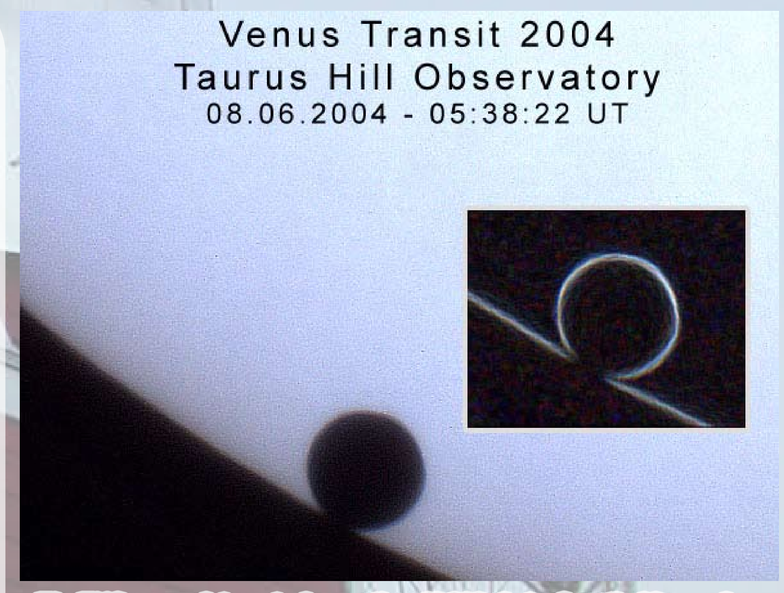
Exoplanets have been one of the specialties of the THO research team. The team has made for some years transit and light curve measurements about the exoplanets. To this date the team has measured over 30 different exoplanet light curves, some of them several times. The first THO measurements have been added to AXA-database is maintained by Bruce L. Gary and now observatory is also using EDT (Exoplanet Transit Database) is maintained by Variable Star and Exoplanet of Czech Astronomical Society.

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.

Transit Observations of Solar System Objects

Besides the exoplanet transit light curve observations and measurements, the THO research team has observed also solar system object transits. First transit observations were made in 2004 when the Venus transited the Sun. The THO research team participated to two conferences during that year. First time in May 2004 in Czech Republic and second time in December 2004 in Paris. These two conferences were organized by the European Southern Observatory (ESO) and they were part of the "Venus Transit 2004" -project.

The "Venus Transit 2004" -project was the kick-off for the THO research work the European science community. On June 8th 2004 when the Venus transited the Sun, the THO research team had a good fortune because the weather was very nice during the transit despite the bad forecasts. The research team managed to observe the whole transit and took more than 12000 individual pictures from the transit. The THO research team published its own summary document [7] about the results of the Venus transit 2004 campaign and sent these results also to the ESO for further evaluation.



The THO research team took more than 12 000 photos from the Venus when it transited the sun on 2004. Photo: Jari Juutlainen and Harri Haukka / Taurus Hill Observatory.

Venus Transit 2012 - Taurus Hill Observatory "Nordkapp Expedition"

After succesful Venus transit 2004 -project, the Taurus Hill Observatory reasearch team decided to travel to the Northern Norway to observe and photograph the Venus transit 2012. Reason for this was that the transit wasn't fully visible in the THO site in Eastern part of Finland. In the Northern Norway the Sun was above the horizon around the clock and therefore the transit was fully observable. The THO "Nordkapp Expedition"-team set up the equipment and made the observations in Russenes, Norway. The used equipment were Lunt LS60 h-alpha-solartelescope and Nikon D3500 DSLR-camera.

References

[1] *Lightcurve inversion for asteroid spins and shapes*; J. Torppa; University of Helsinki, Faculty of Science, Department of Astronomy; Doctoral dissertation; 2007

[2] *A low-energy core-collapse supernova without a hydrogen envelope*; S. Valenti, A. Pastorello, E. Cappellaro, S. Benetti, P. A. Mazzali, J. Manteca, S. Taubenberger, N. Elias-Rosa, R. Ferrando, A. Harutyunyan, V.-P. Hentunen, M. Nissinen, E. Pian, M. Turatto, L. Zampieri and S. J. Smartt; Nature 459, 674-677 (4 June 2009); Nature Publishing Group; 2009.

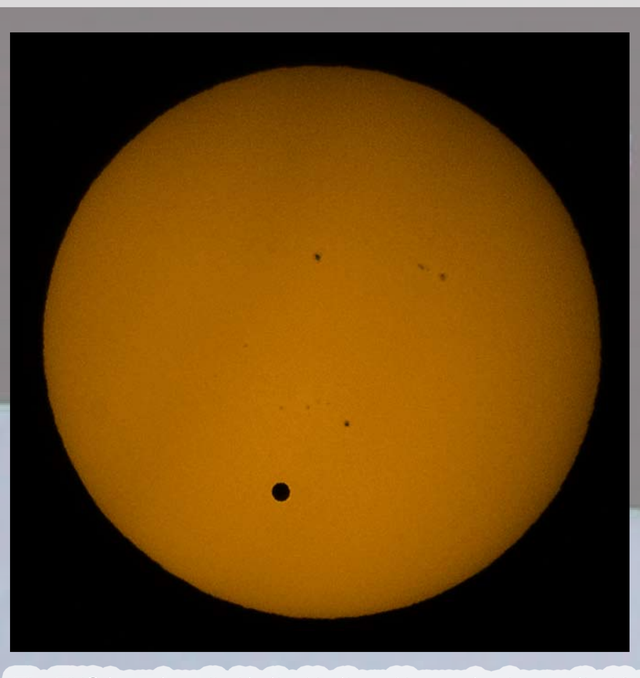
[3] *A massive binary black-hole system in OJ 287 and a test of general relativity*; M. J. Valtonen, H. J. Lehto, K. Nilsson, J. Heidt, L. O. Takalo, A. Sillanpää, C. Villforth, M. Kidger, G. Poyner, T. Pursimo, S. Zola, J.-H. Wu, X. Zhou, K. Sadakane, M. Drozdz, D. Koziel, D. Marchev, W. Ogloza, C. Porowski, M. Siwak, G. Stachowski, M. Winiarski, V.-P. Hentunen, M. Nissinen, A. Liakos & S. Dogru; Nature - Volume 452 Number 7189 pp781-912; Nature Publishing Group; 2008.

[4] *Small Telescope Exoplanet Observations in Taurus Hill Observatory*; V.-P. Hentunen, M. Nissinen, H. Haukka and H. Aartolahti; Vol. 4, EPSC2009-119, 2009; European Planetary Science Congress 2009

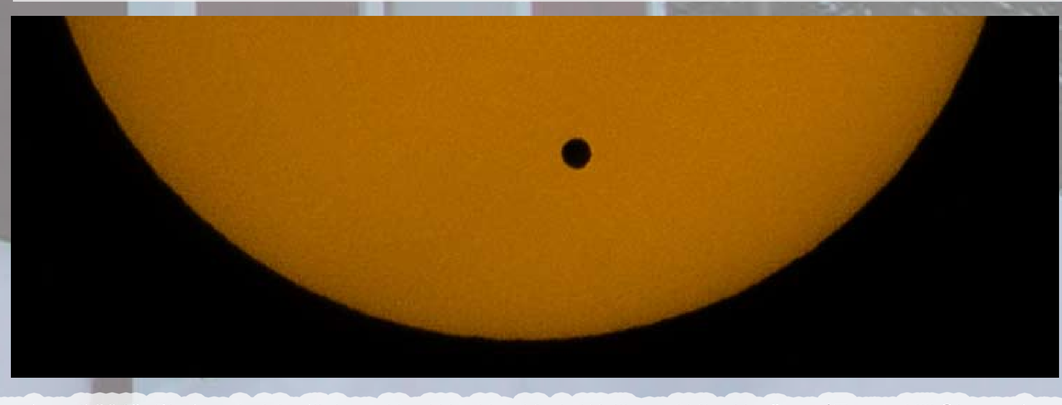
[5] *Small telescope stellar object light curve measurements*; H. Haukka, V.-P. Hentunen, M. Nissinen, T. Salmi, and H. Aartolahti; Vol. 5, EPSC2010-170, 2010; European Planetary Science Congress 2010

[6] *Ground Based Support for Exoplanet Space Missions*; H. Haukka, V-P. Hentunen, M. Nissinen, T. Salmi, H. Aartolahti, J. Juutilainen and H. Vilokki; Vol. 6, EPSC-DPS2011-683, 2011; EPSC-DPS Joint Meeting 2011

[7] *Venus Transit 2004 - The Observations and the Results from the Taurus Hill Observatory* (http://www.taurushill.net/tho_publications/nro1/tho_publications_nro1.pdf); H. Haukka, J. Juutilainen V-P. Hentunen, M. Nissinen, H. Aartolahti and H. Taino; 19 pages; 2007



Team managed to photograph the transit of the Venus for about 5 hours 40 minutes before the clouds made the observations impossible. Due to the clouds, the the team was unsuccessful in observation and photography of the last two contacts. The First and the second contacts were observed. The total amount of pictures taken during the transit was about 700.



The THO team travelled to the Northern Norway to observe the Venus transit 2012. Photos: Jari Juutilainen, Harri Haukka, Marja Wallin and Mira Hyvönen / Taurus Hill Observatory.

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://english.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