

# Amateur observations of exoplanets in Finland: History and recent activities

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Exoplanets have been observed by Finnish amateur astronomers already 17 years. Recently there are three active observers or observing groups, but the interest in photometric observations of exoplanet transits is increasing in Finland.

## 1. History

The first exoplanet transit observation in Finland was made by Jyväskylän Sirius observing group: Marko Moilanen, Jalo Ojanperä, Jouni Sorvari, Aki Id and Arto Oksanen on 16 September, 2000 [1]. The observation of HD 209458 exoplanet transit was made with 16-inch Meade telescope and SBIG ST7E CCD camera in Nyrölä Observatory in Central Finland. The observation was confirmed by Geoffrey Marcy from University of California at Berkeley.

This was also the first amateur observation of exoplanet transits in the world. It started the rising interest on exoplanet observing among Finnish amateurs.

The observation was also one reason why NASA and Berkeley scientists founded Transitserach.org network [2] for coordinating amateur exoplanet observations. Sirius group continued collaboration with newly founded Transitsearch.org.

Taurus Hill Observatory (THO) began the scientific research campaigns by observing supernovae and making the first amateur supernova discoveries in Finland. After success in supernova discoveries, THO concentrated mainly on the light curve measurements, especially exoplanets. First contacts between THO and the scientific com-

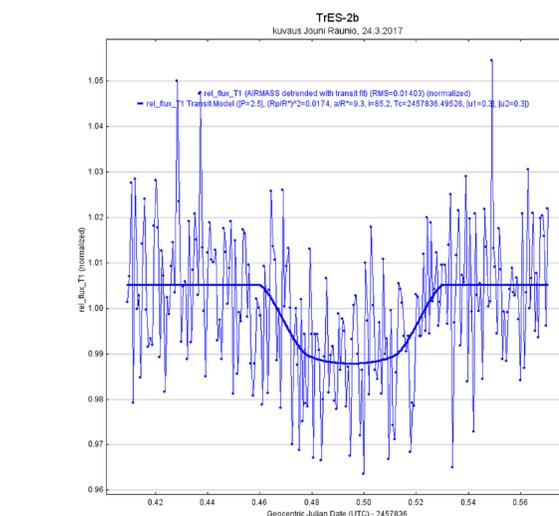


Figure 3. Exoplanet transit of TrES-2b on Mar 24, 2017 by Tampereen Ursa Team: Jouni Raunio, Tomi Hyvönen and Matti Koskinen.

munity were with Gregory Laughlin [7] and his research partners in 2007. As the light curve measurements were in the high scientific level, THO further initiated research partnerships e.g. with TRESKA [5] and latest with the Pulkovo Observatory (Russia) [6]. Nowadays THO has observed and measured over 50 exoplanet light curves.

## 2. Recent activities

Currently there are three amateur groups observing exoplanet transits in Finland.

Petri Kehusmaa is collaborating with KELT (Kilodegree Extremely Little Telescope) observation system [3]. The main goals for this cooperation are:

- multiband photometric observations of exoplanet candidates found by KELT wide field cameras and contributing light curve data to research team
- find new exoplanets

## References

- [1] [http://www.ursa.fi/yhd/sirius/HD209458/HD209458\\_eng.html](http://www.ursa.fi/yhd/sirius/HD209458/HD209458_eng.html)
- [2] Transitsearch.org, <http://www.transitsearch.org/>
- [3] KELT-south, <https://my.vanderbilt.edu/keltsouth/>
- [4] CONTRAST, <http://www.hotmol.eu/index.shtml>
- [5] TRESKA, <http://var2.astro.cz/EN/>
- [6] Pulkovo Observatory, <http://www.gao.spb.ru/english/index.html>
- [7] <https://www.ucolick.org/~laugh/>
- [8] EPSC 2017 poster; EPSC2017-71

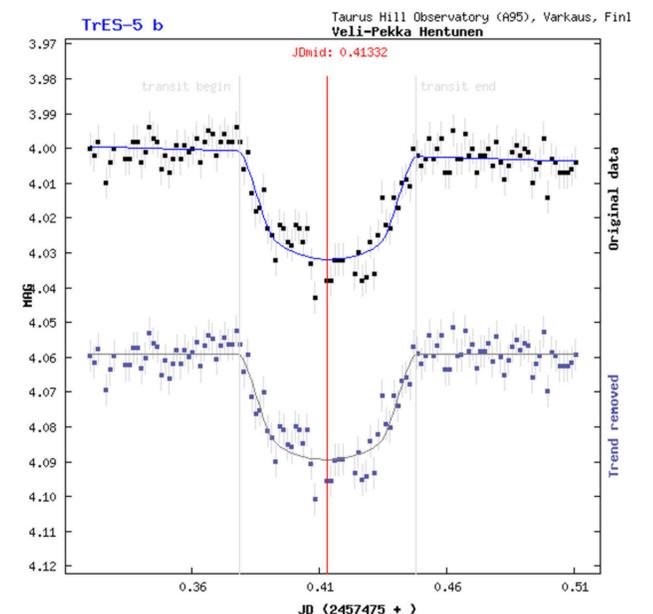


Figure 4. Exoplanet transit of TrES-5b on Mar 27, 2016 by Veli-Pekka Hentunen / Taurus Hill Observatory / TRESKA.

Kehusmaa is also working as support astronomer in CONTRAST team [4] which is collaboration of several projects on planetary science. Kehusmaa is observing two known exoplanet system to analyze their full period cycle. Kehusmaa is using remote controlled telescope in Chile.

During the winter 2016–2017 Taurus Hill Observatory has focused on the Pulkovo Observatory exoplanet research campaign by observing the carefully pre-selected stars [8]. The aim of the observation campaign is to find out about the orbiting times of potential exoplanets around their central star and the magnitude of brightness change in the central star caused by them. This campaign will continue on the next observing seasons.

Observing team of Astronomical Association Tampereen Ursa: Jouni Raunio, Tomi Hyvönen, Matti Koskinen and Kari Nyman have observed several transits of well-known exoplanets during 2015–2017 in Tampere area.

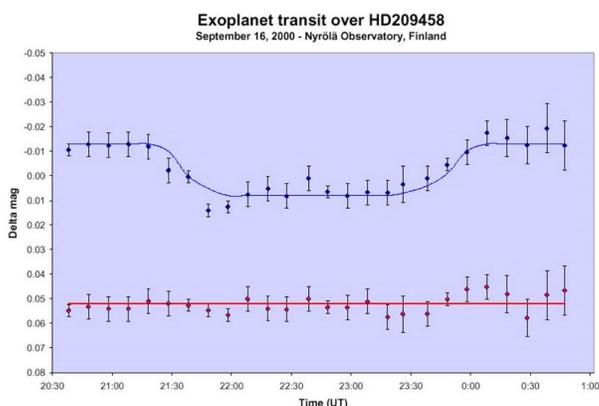


Figure 1. The first amateur observation of exoplanet transit in the world on HD 209458 on Sep 16, 2000 by Jyväskylän Observing Group.

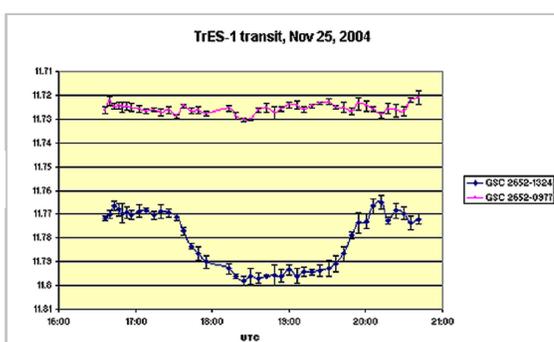


Figure 2. Transit TrES-1 on Nov 25, 2004 by Arto Oksanen.

THO

JYVÄSKYLÄN SIRIUS ry

Tampereen Ursa

Ursa Astronomical Association,  
Scientific Cooperation Group

Special interest group for  
professional–amateur cooperation  
and citizen science in Finland

cooperation with