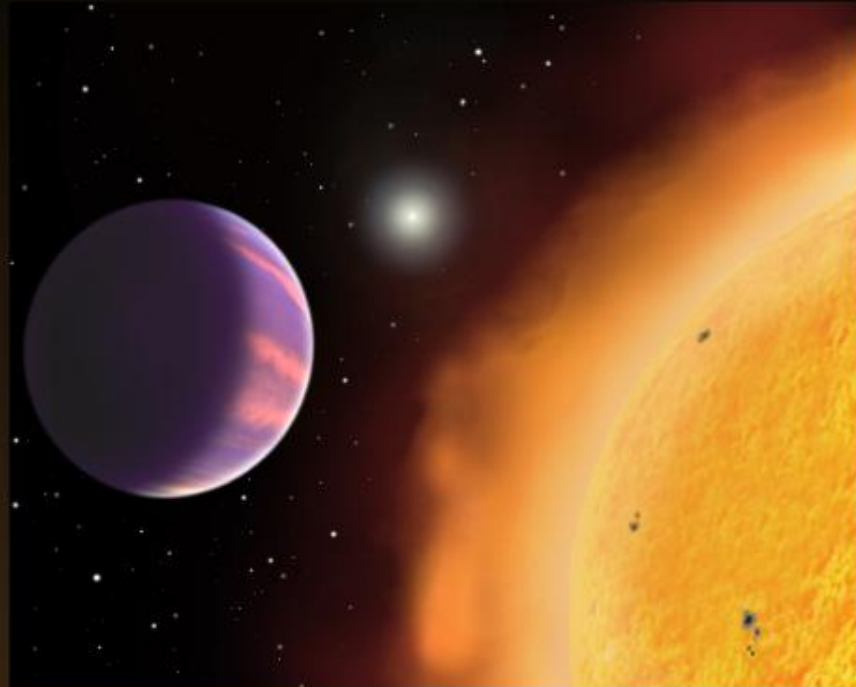

Introduction



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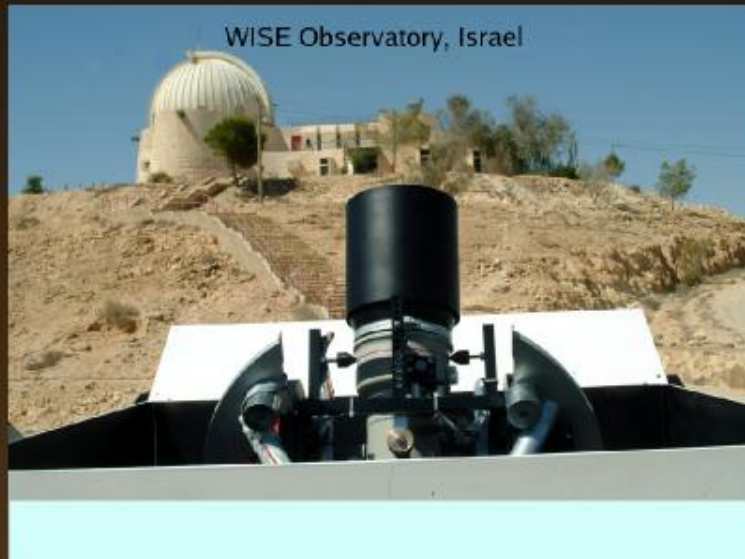
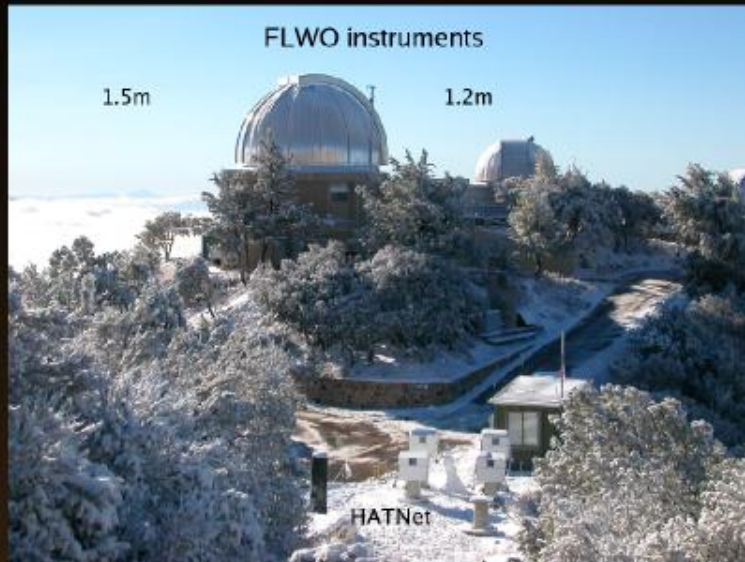
RoPACS Meeting, IAC, 17th November 2009

Background

- Amateur astronomer since 1999
- First research project in high school on Ia SNe, University of Szeged
- Master's studies in Physics at Eötvös University, still ongoing
- One semester in La Laguna, 2006/2007
- Summer studentships and visiting student at the CfA, 2006-2009
- Master's degree in Astronomy 2009



HATNet: Hungarian-made Automated Telescope Network



Path to discover transiting planets at HATNet

- HATNet observations:

- Take observations with the HATNet telescopes
- Raw data calibration
- Astrometry and aperture photometry
- Light curve postprocessing, trend filtering
- Candidate selection based on HATNet photometry

- Follow-up observations:

- Follow-up photometry, filtering blends and false positives
- Reconnaissance spectroscopy, filtering astrophysical false positives
- High resolution spectroscopy using HIRES on Keck-I

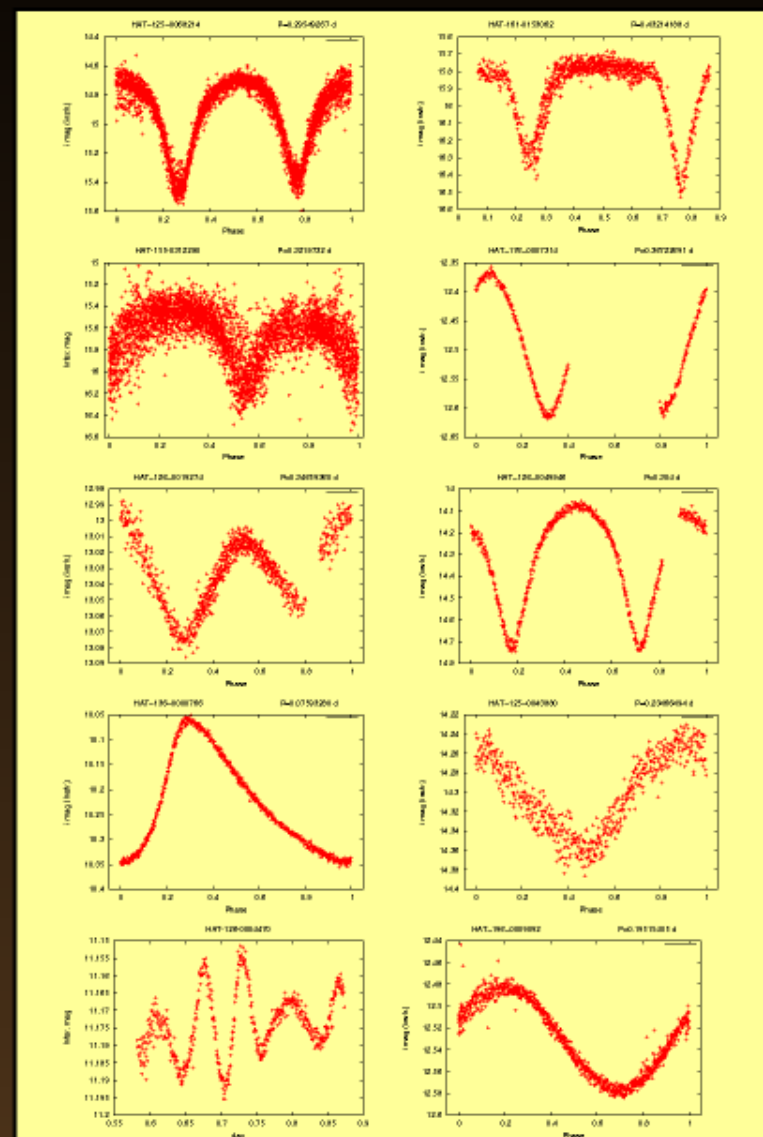
Photometry Follow-up

- 1.2 m telescope at Whipple Observatory (FLWO) in Arizona
- Keplercam with FOV of 23.1×23.1 arcminutes.
- 460 observing sessions of 220 candidates at 300 nights in the last 3.5 years.



Mining for variable stars in follow-up photometry data

- Systematic search for variable stars in the FOV
- Analysis of FOV of 70 candidates is done meaning 35,000 stars
- ~ 1200 of them show some kind of variability
- Poor phase coverage for most of them.
- $\sim 150 - 200$ of them can be classified firmly.



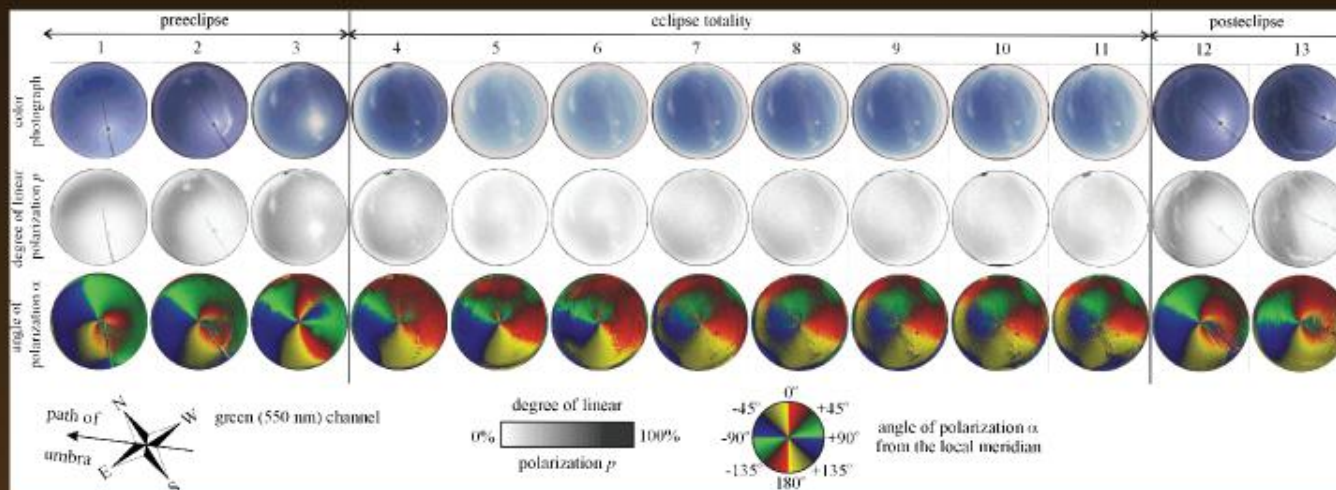
Archival data of HAT-1 survey

- HAT-1 is the prototype of HATNet telescopes
- Operational between May 16, 2001 and June 26, 2002 at Kitt Peak
- Observing strategy was designed for variable stars
- Calibrating and reducing data
- Search for bright variable stars, compile a catalogue
- Refine parameters of HATNet variable stars and known transits
- Search for transits



Previous projects

- All-sky imaging polarimetry
 - Polarization pattern of the sky changes during eclipses
- Many weeks observing at Piskéstető
 - Photometry of Supernovae, distance determination
 - Astrometry and searching for minor planets



Current work in RoPACS

- Modelling WTS light curves to improve candidate selection for follow-up studies
- Light curve trend filtering with TFA and Sys-Rem
- ...



Credit: NR Szymarek