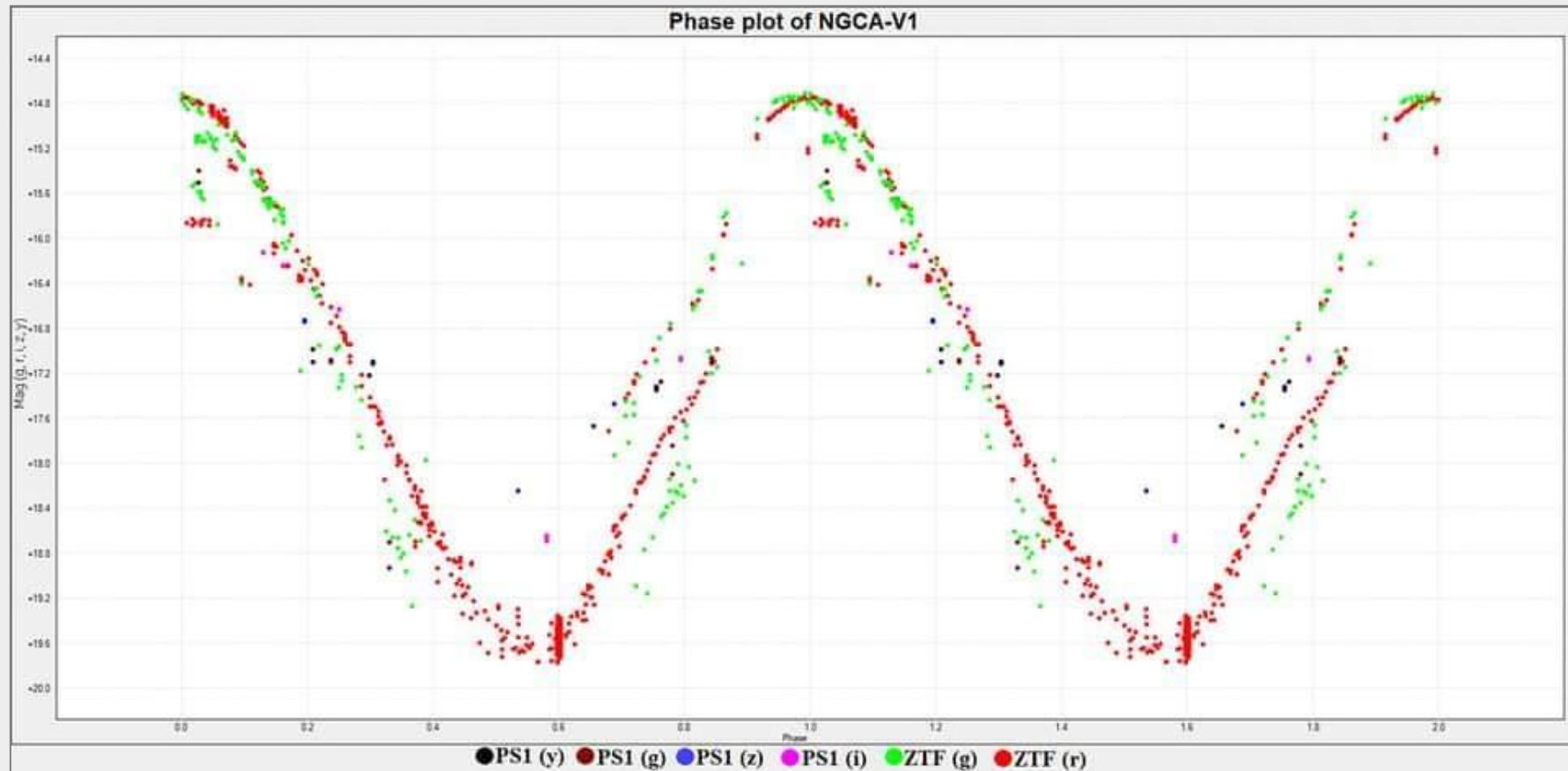


Saturday, Jan 23, 2021 @ 4 PM UTC

Peranso 3 • Lightcurve Analysis Software • Live Showcase

Hosts: Gabriel Cristian Neagu and Tonny Vanmunster

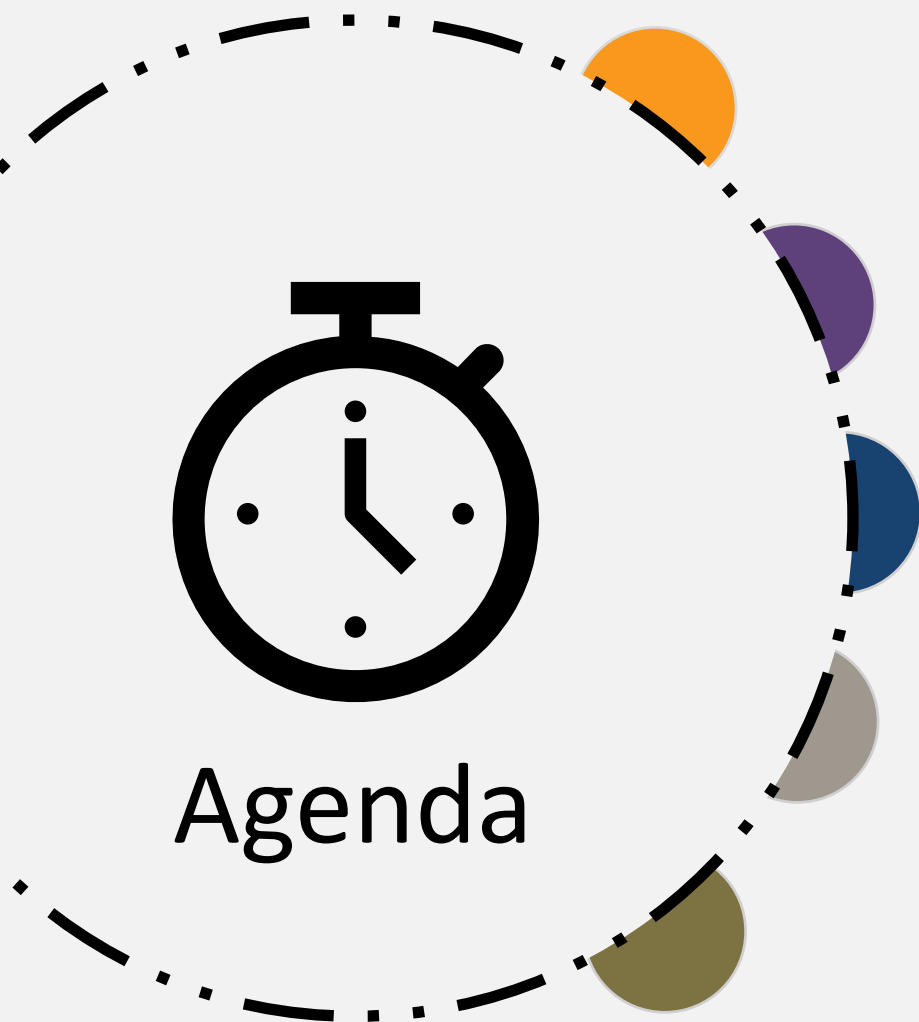


Peranso



Light Curve and Period Analysis Software

Peranso 3 • Lightcurve Analysis Software • Live Showcase



1.

Welcome & Introduction to Peranso

Gabriel Cristian Neagu – Tony Vanmunster

2.

End-to-end analysis of an eclipsing binary light curve, using ZTF data

Gabriel Cristian Neagu

3.

Finding multi-periodicities in an AAVSO light curve

Tony Vanmunster

4.

Detecting long term period evolutions in a Mira variable light curve

Tony Vanmunster

5.

What's Next in Peranso & Adjourn

Tony Vanmunster – Gabriel Cristian Neagu

1.

Welcome & Introduction to Peranso

- Active variable star observer since 1975; switched to CCD observations exactly 25yrs ago
- Pro-am co-operation: many professional astronomers (variable stars, exoplanets, ...)
- Publication of papers -> professional tools for period analysis were scarce and not easy accessible for amateur astronomers
- Software engineering background
- Triggered appetite to write own period analysis software, with focus on ease of use
- Started around 2004 with Peranso 1 -> period analysis
- Extended with light curve analysis functions around 2006 (Peranso 2)
- Around mid 2019: rewrite of Peranso from scratch to take advantage of Internet, .NET, access to wide variety of variable star data sources (surveys, AAVSO database, ...)
- Peranso 3: launched last days of 2020
- Today, Peranso is used by several hundred of amateur and professional astronomers around the world, and cited in dozens of publications

2.

End-to-end analysis of an eclipsing binary light curve, using ZTF data

3.

Finding multi-periodicities in an AAVSO light curve

- Extract multi-periodic signals from the light curve¹ of **RV Tauri**
- RV Tau is prototype star of the **RV Tauri type** variables: radially pulsating supergiants showing alternating primary and secondary minima
- We will use the **CLEANest method** as described by Grant Foster in a 1995 paper
- We will illustrate how to **auto-detect** multi periodivities using Peranso
- More information: see Tutorial 4 of the Peranso User Guide @ www.peranso.com

¹ We acknowledge with thanks the variable star observations from the AAVSO International Database contributed by observers worldwide, and used in this research

4. Detecting long term period evolutions in a Mira variable light curve

- Periods of many variable stars are not stable over time
- **T UMi** is a semi-regular variable star (gaints or supergiants having intervals of quite regular periodicity, but sometimes interrupted by various irregularities)
- We will use the **WWZ (Weighted Wavelet Z-Transform) method** described by Grant Foster in his excellent book *“Analyzing Light Curves – A Practical Guide”*
- We will detect the period evolution of T UMi over a period of almost 100 years¹
- More information: see Tutorial 5 of the Peranso User Guide @ www.peranso.com

¹ We acknowledge with thanks the variable star observations from the AAVSO International Database contributed by observers worldwide, and used in this research

5.

What's Next in Peranso & Adjourn

- Removal of outlier observations
- Direct plot of Pan-STARRS light curves (similar approach as with AAVSO, ZTF, ASAS)
- Direct plot of Catalina Survey CSDR2 light curves
- Support of Kepler, TESS light curves (either import from file or direct plot)
- Support of NSVS, SuperWASP, etc (either direct import from file or direct plot)
- Import of ALCDEF (Asteroid Light Curve Data Exchange File)
- Save to PNG file
- Legend-in-window
- Data mining - automation: import file with coordinates (or names) of objects and Peranso will auto-create an ObsWin per object and store ObsWin to a file
- Tentative
 - Novel period analysis methods: “Event Data” periodogram, which uses time of arrival of events (eg, pulsar pulses)
 - Two-dimensional Fourier analysis method for analysis of tumbling asteroids



Thank you for attending

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