Astrocamp

VARIABLE 2017

July 17 – 26, 2017

Astronomical Observatory on Kolonica Saddle

GENERAL INFORMATION

Organizer:	Vihorlat Observatory Humenné, Roztoky Observatory, Gmina Wisniowa
In collaboration with:	**The Slovak Central Observatory, Hurbanovo**
Co-organizers:	Slovak Union of Astronomers, Faculty of Science Pavol Jozef Šafárik University in Košice, Non Investing Fundation Telescope
Aim:	Variable star observing
Dates:	**17/07/2017 – 26/07/ 2017**
Venue:	Astronomical Observatory on Kolonica Saddle, Snina district, Slovakia
Boarding:	4 foods daily: breakfast, lunch, dinner, midnight refreshment.
Accommodation:	In accommodation facilities of the Planetarium at Kolonica Saddle.
Registration fee:	**50 Euro**. To be paid at the time of arrival. Covers all costs of the event except boarding. The price for boarding is **6 Euro per day**.
Meeting point:	17/07/2017 (Monday), AO on Kolonica Saddle at $15^{:00}$.
Questions:	Should be addressed to P. A. Dubovský: var@kozmos.sk

PARTICIPANTS

There will be 3 kinds of participants in the astrocamp:

1. Researcher – the main participant. During the astrocamp is solving one of research tasks listed below
2. Operator – helps researchers with practical observations and solves technical tasks listed below
3. Supervisor – helps researchers and operators with theoretical background

Every participant is required to bring the following equipment:

1. Warm clothing, including jacket and shoes for observation during the cold night
2. Toiletry
3. Stationery - workbook, pencil, calculator
4. Watches or stopwatch
5. Identification card or passport

Will be appreciated:

6. Your own IT equipment – notebook
7. Sportswear (football, tennis, volleyball, swimming, hiking).
8. Party games, musical instruments.

Organizing comitee

The head:	RNDr. Igor Kudzej, CSc., director of the Vihorlat Observatory

Supervisors: Mgr. Marcin Cikala, Mgr. Bartłomiej Dębski, Mgr. Gregorz Sęk, Pavol A. Dubovský, Doc. Vlada Marsakova, CSc.

DAILY SCHEDULE (in CEST = UTC+2 hours)

10^{00} - 11^{00}	personal hygiene, breakfast
11^{00} - 14^{00}	observational data reduction, research tasks solving
14^{00} - 15^{00}	lunch
15^{00} - 19^{00}	educational and sports events
19^{00} - 20^{00}	BoRo – information about observing program for the night; reports of the researchers and operators
20^{00} - 21^{00}	dinner
21^{00} - 02^{00}	observation (~24:00 midnight refreshment)
02^{00} - 10^{00}	night rest

RESEARCH and TECHNICAL TASKS

As the innovation of the astrocamp format the tasks are statically tied to the instruments at the observatory. The other innovation is the implementation of technical tasks for operators.

1. VNT telescope 1000/9000 mm, FLI PL1001E camera, filters B V Rc Ic Clear

Research Task: To construct the **Binary star model**. Determine the basic parameters of the binary star system. Use your own CCD observations of selected eclipsing binary with four photometric filters (B V Rc Ic) and precise photometry from Kepler database. It is necessary to observe at least one complete light curve (all phases). The corresponding model can be constructed using available program, for example “PHOEBE”.

Technical Task: Investigate the influence of the **flat field calibration** on photometric results of standard stars in the field of view. Compare the application of sky flats and mathematical background equalization.

Supervisor: Bartłomiej Dębski
Operators:
Researchers:

2. Pupava telescope 280/1500 mm, Meade DSI Pro II camera, without filters

Research Task: **Superhumps**. Determine the period of superhumps of SU UMa type cataclysmic variable and its evolution during superoutburst. Use your own CCD observations of the object in superoutburst during the astrocamp. SU UMa type cataclysmic variables shows typical “humps” on the light curve. The period is usually slightly longer than orbital period of binary system. The typical value of the period is 80 - 120 minutes. It is easy to determine the period of superhumps using all night time series observation. The period evolves during the superoutburst. This tell us something about precession movement of the accretion disc. Therefore we have to observe as long as possible every night during the superoutburst. It is not necessary to observe with photometric filters. The accretion disc light is white.

Technical Task: Investigate the behavior of **autoguiding system** of the telescope. Compare the results with and without guiding. What is the limiting magnitude for superhumps observation in both cases. Determine the maximum acceptable exposure time without guiding limited by periodic error.

Supervisor: Gregorz Sek
Operators: Tomáš Medulka
Researchers:

3. C14 Celestron Edge HD CGE Pro 1400, 350/3910 mm, MII G2-1600 camera, filters B V Rc Ic Clear

Research Task: To construct **O-C diagrams** of times of minima of several eclipsing binaries. Use the data from available databases and at least one personal measurement. Determine CCD time of minima using Kwee & van Woerden method (software AVE) and fitting tool implemented on var.astro.cz as well. Explain the obtained graphics. Recommended targets: from the list of the Project dwarf.

Technical Task: Use the **focal reducer** to obtain larger FOV. Compare the efficiency of the astrometric solution with and without reducer. Investigate the influence of the focal reducer on the photometry of the standard stars.

Supervisor: Marcin Cikala
Operators:
Researchers:

4. C11 - Celestron CGEM 1100, 280/2800 mm, MII G2-1600 camera, filters B V Rc Ic Clear
Research Task: To acquire several points on light curves of **Semiregular and Symbiotic variable** stars from the "MEDÚZA" list. Transform the CCD measurements into the standard photometric system using previously determined transformation coefficients. Construct the light curves using your own and archival data.
Technical Tasks: Operate the telescope using different methods of navigation between targets (manually, using software products like RTS2, CCD commander....). Use different ways of guiding (without, off axis, on the attached telescope...). Find the best hardware and software solution for **one point per night observations**. Look for the stability of your system.

Supervisor: Pavol A. Dubovský
Operators:
Researchers:

5. Dobsonian Meade LightBridge 16", 406/1829 mm, visual observation

Research Task: To acquire several points on light curves of "**MEDÚZA stars**" visually. Compete with the GoTo telescope in the task No 4. Perform visual estimates of selected objects using Nijland-Blazhko method during all the astrocamp. For every object – one estimate per night. Construct the light curves using your own and archival data. Include also results from research task No 4 to evaluate the quality of visual observations.

Technical Task: Play with the **eyepieces**. Every target has its optimal magnification and FOV for best brightness estimate. But the frequent eyepiece change is time consuming. Look for the best efficiency during your observing session.

Supervisor: Vlada Marsakova
Operators:
Researchers:

6. Hugo 265/1360 mm, C8 Celestron 150/1500 mm GoTo, binoculars and others

Task: To construct O-C diagrams of times of minima for several eclipsing binaries. Use the data from available databases and at least one personal visual measurement. Determine the time of minima using the **Kordylewski method** (software Protokoly). Select suitable observing targets for the given night using program "POZOR" or "Predpovedi".

Technical Task: Find the **optimal distribution of the targets** between the GoTo telescope, the telescope on the equatorial mount with simple motor drive and the telescope on alt-azimuthal mount without drive.

Supervisor: Igor Kudzej
Operators:
Researchers: