Slovak Academy of Sciences

Astronomical Institute

ANNUAL REPORT 2004

Astronomical Institute, Tatranská Lomnica, Slovakia

Contents

1 Foreword

The present form of the report of the activities of the Astronomical Institute of the Slovak Academy of Sciences does not differ significantly from the last year's report. Its structure and layout are, however, considerably different from those in the corresponding Slovak version (also available at our web page).

Here, we focus almost uniquely on the scientific activities of the Institute and omit a number of important "non-scientific" issues like, e.g., financial matters of the institute, teaching commitments at universities, etc.; these can only be found in the Slovak version.

Looking back at the year 2004 let me just briefly summarize major accomplishments. The amount of scientific production is expressed by 46 papers in internationally distinguished refereed journals and 9 articles in refereed conference proceedings. A number of interesting results have been obtained, some of them being highlighted in what follows. Our institute plays a very important role in 19 well-established international projects and a number of informal collaborations.

Our institute organized the IAU Symposium No. 224 "The A-star Puzzle", held in Poprad on July 8-13, 2004. The symposium was devoted to normal and peculiar stars of the A spectral type. Altogether 31 invited lectures and 20 contributed talks, as well as 86 posters, were presented. The symposium was a very successful professional forum for 124 participants from 26 countries worldwide. The proceedings of the Symposium were published by the Cambridge University Press Publishing House.

The Institute has been the Slovak coordinator of the project 'Venus-Transit 2004'. We organized a two-day meeting for teachers to inform them how to run the project. During the transit we transfered images with the web-camera to Internet on-line. More than 60 schools across the country were involved in the project.

We have also organized the 3rd school of the ESMN (European Solar Magnetic Network) etitled "Solar Magnetometer and Solar Magnetism". The event took place at Tatranska Lomnica from 3 to 10 November, 2004. It was an extensive and intensive introduction into the methodology and results of the current solar physics research, with the focus on solar magnetism. Eleven courses were given on the most important topics of solar physics. About 60 participants attended the school, mainly PhD students and graduate students from the European Union.

The latest volume (no. 34) of our journal Contributions of the Astronomical Observatory Skalnate Pleso appeared in three regular issues. The journal is covered by the ISI and is electronically available from our web page (http://www.astro.sk) and the ADS database as well.

We have also succeeded in substantially improving our observational facilities. The dome of the 0,5-m reflecor for CCD photometry of stars was connected by fiber optics to the main institute's building at Stara Lesna. The 0,61-m comets and asteroids reflector at the Skalnate Pleso Observatory was rebuilt for automatical regime. A complex reconstruction of windows and outer doors at the mountain Skalnate Pleso Observatory and a new generator of electric power installed at the Lomnicky Peak Coronal Station made better working conditions for our observers and scientists. Our conference hall at the institute headquarters was equipped with a modern computer projector.

Ján Svoreň
director of AI SAS

2 Research

2.1 Interplanetary matter

Observational facilities:
Skalnaté Pleso Observatory - a 61 cm reflector with a CCD camera, an all sky fireball fish-eye camera; Modra Observatory - a receiver of a forward scatter meteor radar.

Research activities:

- theoretical investigation of transfer orbits among different populations of small bodies in the Solar System regarding near-Earth objects
- photometry and astrometry of asteroids and comets,
- investigation of the activity of selected cometary nuclei and its influence on the physical and dynamical evolution of these bodies,
- a search for meteoroid streams of an asteroidal origin,
- investigation of the meteoroid population in the vicinity of the Earth's orbit,
- interrelations among the populations of small bodies in the Solar System and their evolution,
- description of the distribution of meteoroid particles in the inner Solar System,
- study of the structure of selected meteor showers,
- identification of the meteor sporadic background activity by a forward scatter radio system,
- detection of ozone in the upper mesosphere with ground based radio observations,
- operation of fireball fish-eye cameras within the framework of the European Fireball Network,
- investigation of the light scattering of dust particles in the Solar System and Earth atmosphere,
- search for hyperbolic and interstellar meteoroids using data from IAU Meteor Data Center and other sources,
- study of meteorite properties.

2.2 Solar physics

Observational facilities:
Stará Lesná Observatory - a horizontal solar telescope with spectrograph, Lomnický Peak Coronal Station - a double 20 cm coronagraph with a spectrograph.

Research activities:

- study of rotational characteristics of sunspots and surrounding photospheric plasma based on own measurements,
- spectral analysis of the quiet and active solar photosphere and chromosphere using spectra from Tenerife VTT observations,

- study of the dynamics and energy transfer in the quiet upper solar atmosphere from SOHO (SUMER, CDS, EIT) and TRACE satellites data,
- investigation of the coupling of a cosmic ray modulation and solar LDE flares and also coronal mass ejections,
- derivation of magnetic fields in specific coronal structures using own eclipse observations,
- analysis of coronal holes and their relation to the background and local magnetic fields and a relationship between polarization and intensity of the green line in different coronal structures,
- study of a time-latitudinal distribution and large-scale development of solar prominences,
- observations of both the 530.3 nm and 637.4 nm emission coronal lines as well as the white-light corona to study solar cycles,
- preparation of the homogeneous coronal data set for the 530.3 nm coronal line,
- computation of the coronal index of solar activity.

2.3 Stellar astrophysics

Observational facilities:
Skalnaté Pleso Observatory and Stará Lesná Observatory - two 60 cm photometric reflectors, a 50 cm reflector with a CCD camera.

Research activities:

- investigation of interacting binary and multiple systems, symbiotic stars, novae and nova-like objects focused on physical processes during phases of their activity, studies of their origin, structure, evolution and physical conditions in the circumstellar environment,
- photometric detection of various manifestations of both regular and semi-regular stellar variability, models' construction explaining the behaviour of the systems,
- use of the IUE as well as HST databases for the spectroscopy of interacting binaries and direct HST images to study expanding envelopes of novae and symbiotic stars,
- spectroscopic investigation of chemically peculiar star phenomena based on spectra from ESO, Mt. Stromlo, Nauchnyj, Ondřejov, Rozhen and Zelenchuk observatories,
- study of the chemical composition and properties of the atmospheres of CP stars, and the role of radiative diffusion of some species,
- search for possible relations between the orbital parameters of binaries with Am components.

3 Personnel

3.1 Executives

Director : J. Svoreň, deputy director : J. Žižňovský, scientific secretary : J. Rybák

3.2 Scientific Council

J. Grygar, A. Hajduk, D. Chochol, A. Kučera (chairman), L. Neslušan, V. Porubčan, J. Rybák, M. Saniga, A. Skopal, T. Pribulla (vice-chairman)

3.3 Department of Interplanetary Matter

Head: A. Hajduk
Staff in Bratislava: J. Farkašová, M. Hajduková, Jr., I. Kapišinský, M. Kocifaj, J. Pittichová (currently a post-doctoral scientist at the Institute for Astronomy, University of Hawaii, USA), E. Pittich, T. Paulech (postgraduate student), V. Porubčan, N.A. Solovaya
Staff in the High Tatras: G. Červák (technician), M. Husárik (postgraduate student), M. Jakubík (postgraduate student), Z. Kaňuchová (postgraduate student), L. Neslušan, P. Rychtarčík (technician), J. Svoreň

3.4 Department of Solar Physics

Head: A. Kučera
Staff: P. Bendík (technician), P. Gömöry (postgraduate student, MC fellowship at the Utrecht University, the Netherlands - since 15/11), Ľ. Klocok, J. Koza (postgraduate student till 1/3), R. Mačura (technician), K. Maník (technician), M. Minarovjech, M.Mocák (since 1/9), V. Rušin, M. Rybanský, J. Rybák, M. Saniga, L. Scheirich (technician), J. Sýkora, F. Tomasz (postgraduate student)

3.5 Stellar Department

Head: J. Žižňovský
Staff: J. Budaj (currently a post-doctoral scientist at the Penn State University, USA), L. Hric, D. Chochol, R. Komžík, K. Kuziel (technician), T. Pribulla, P. Schalling (technician), A. Skopal, J. Tremko, M. Vaňko (postgraduate student till 1/6), M. Zboril, J. Zverko

3.6 Administration and Maintenance

Head: M. Alman
Staff: J. Ambroz, R. Bekeš, F. Buzák, T. Drzewiecka, T. Griešová, Ľ. Hanigovský, D. Novocký, A. Sanigová, M. Šoltýsová, P. Zimmermann, M. Zummerová.

4 Guests

In 2004, the following guests visited our institute: P. Ambrož (Astronomical Institute, Ondřejov, Czech Republic), J. Boška (Institute of the Atmospheric Physics, Prague, Czech Republic), A. Budovičová (Astronomical Institute, Ondřejov, Czech Republic), G. Cevolani (ISAC (FISBAT) CNR, Bologna, Italy), I. Iliev (Rozhen Observatory, Bulgarian Academy of Sciences, Sofia, Bulgaria), A. Kawka (Astronomical Institute, Ondřejov, Czech Republic), D. Korčáková (Astronomical Institute, Ondřejov, Czech Republic), P. Križan, Institute of the Atmospheric Physics, Prague, Czech Republic), K. Krtička (Astronomical Institute, Ondřejov, Czech Republic), J. Kubát (Astronomical Institute, Ondřejov, Czech Republic), D.O. Kudrjavcev (SAO RAN, Russia), J. Laštovička (Institute of the Atmospheric Physics, Prague, Czech Republic), Z. Mikulášek (Institute of Theoretical Physics and Astrophysics, Masaryk University, Brno, Czech Republic), J. Pettingrew (University of Queensland, Brisbane, Australia), P. Pracna (J. Heyrovský Institute of Physical Chemistry, Prague, Czech Republic), G. Pupillo (ISAC (FISBAT) CNR, Bologna, Italy), J.I. Romanjuk (SAO RAN, Russia), S. Shugarov (Sternberg

Astronomical Institute, Moscow State University, Moscow, Russia), T. Šindelářová, Institute of the Atmospheric Physics, Prague, Czech Republic), P. Škoda (Astronomical Institute, Ondřejov, Czech Republic), J. Střeštík (Geophysical Institute, Prague, Czech Republic), M. Temmer (IGAM, University of Graz, Graz, Austria), V. Votruba (Astronomical Institute, Ondřejov, Czech Republic), I. Volkov (Sternberg Astronomical Institute, Moscow State University, Moscow, Russia).

5 Results

The main results acquired and published by the research personnel of the Astronomical Institute in the year 2004 are briefly described below. Information about the reference to the published paper in the list of publications is given in brackets.

1/ The most significant results of the year 2004: Influence of the electromagnetic radiation on dynamics of the interstellar cosmic dust particles in the Solar System. Interstellar grains entering the Solar System (SS) are mainly affected by solar gravity, radiation pressure, and electromagnetic effects. The trajectories of sub-micron dust particles in the SS are also strongly influenced by Lorentz force, which, in general, influences the motion of charged dust in the magnetic field. It is usually accepted that the radiation pressure force is directed radially away from the Sun and thus reduces the solar gravitational attraction. Nevertheless, any irregularity of the particle's shape generates non-radial momentum components in the particle's frame of reference. Finally, the character of motion may significantly differ from the corresponding motion known for ideally spherical particles. The effect of particle's morphology implies relevant consequences for the evolution of the particle's trajectory and its lifetime in the SS. In contrary to the results known for spherical particles, we have shown that the charged irregularly shaped grains can be captured in a very narrow belt near the ecliptic plane and may then definitely contribute to the density increase of circumsolar dust cloud. The solar radiation force appears to be the most dominant factor affecting the capture of the interstellar grains. In addition, we found that survived non-spherical interstellar dust particles orbiting around the Sun are characterized by a quantity analogous to Kepler's third law. This fact can efficiently be utilized in various astrophysical modellings of interstellar dust particle dynamics in the circumsolar region (papers Nos. 26, 27).

2/ The most significant result obtained within frame of international collaboration: Study of the circumstellar matter and accretion discs in the interacting binary stars. Interacting binaries exhibit various forms of circumstellar matter. Accretion discs, gas streams, jets and shells galore. It is all footprinted in their spectra. Unfortunately, most of the current models treat only the binary stars and their geometry and the stars are stripped of any circumstellar matter. Consequently, properties of such a matter are not very well understood. We have succeeded in developing a computer code which is, to our knowledge, so far the only tool for interacting binaries capable of taking into account the semi-transparent circumstellar matter. The code solves the equation of radiative transfer along the line of sight in 3D moving media under the assumption of LTE. Scattered light can be taken into account assuming optically thin environment. A light curve or spectrum of the system from any angle can be calculated. The code was applied to the H alpha line originating from an accretion disc similar to that in TT Hya - an eclipsing Algol type binary. The wedge shaped disc with a Keplerian velocity field was assumed. The calculated spectral line has a shape of a double peaked emission with a central depression which is really observed. The temperature and inclination of the disc have the strongest effect on the depth of the central depression, while the outer radius of the disc, the radial density profile, and the inclination affect mainly the position and separation of the emission peaks. The overall strength of the emission is regulated mainly by the density and temperature. The era of modelling the observed emission lines in interacting binaries begins. (paper No. 12).

3/ Studies of transfer orbits between the Jupiter family comets and Encke-like orbits show that on a time scale some of the model orbits of the Jupiter family comets will change to the Encke-like orbits. This time scale is comparable to the activity period of short-period comets. The main factors for this orbital change are resonances and non-gravitational forces (paper No. 33).

4/ Using the newly published method by Lynch, we evaluated the statistical significance of the correlation between the observed sequence of mean heliocentric planetary distances and a power law. It turns out that the observed agreement very probably occurred by chance for 8 known planetary distances (Mercury to Neptune) with the added mean distance of the asteroids. However, the clearly opposite conclusion is true, if the distance of the Earth is omitted in the above mentioned sequence. It indicates a peculiar location of the Earth's orbit. (paper No. 29).

5/ There were carried out and analysed common forward scatter meteor observations of the Leonids 1996-2002 and Quadrantids 1997-2004 performed along two baselines: Lecce-Bologna and Bologna-Modra. The observations have convincingly demonstrated a filamentary structure and systematic change of the mass distribution exponent in the streams. The strongest maximum of larger meteoroids in the Quadrantid meteoroid stream was observed in 1997 (papers Nos. 34 a 37).

6/ We solved a problem of the dynamical stability of extra-solar planets in two stars systems with the theory of the general three-body problem. We used the Hamiltonian neglecting short-period terms, using von Zeipel's method. A designed analytical method properly describes the movement of extra-solar planets and gives us comparable results with numerical integration of orbital equations. This theory was applied on double star systems Gliese 86, γ Cephei and 61 Cygni (paper No. 48).

7/ To determine the radial structure and population of the Oort cloud, the perturbation of the cometary orbits in this reservoir by the Galactic tide was analysed. Within the work, the theoretical frequency of cometary passages through the zone of visibility (ZV) was found. It was assumed that the distribution of the cometary perihelion distance in the ZV is (i) flat and (ii) linear (paper No. 30).

8/ 70 positions of comets and 480 positions of minor planets have been observed and reduced within the project of the determination of astrometric positions of selected comets and asteroids (papers Nos. 49, 75, and 76).

9/ By the analysis of the Fermo meteorite (Italy) the non-analyzed chracteristics of this meteorite were derived and were compared with other known chondrites.
(paper No.63).

10/ Using data from the IAU Meteor Data Center it was shown that the rate of interstellar meteoroids is in catalogues of MDC overestimated by more than of one order of magnitude for photographic, as well as for radio meteors. (papers Nos. 59 and 60).

11/ A degree of condensation of a cometary image was analysed form the point of view of an instrumental factores influence on scales of cometary magnitudes. Qualitative definitions of individual steps of the DC-scale with low precision were replaced by a new quantitative formula (paper No. 73).

12/ We have studied a particular type of Cremonian space-time giving rise to a scenario where the signature of the very early Universe might have been different from that currently observed. (paper No. 42).

13/ It was conjectured that the question of the existence of projective planes whose order is not a power of a prime is intimately related with the problem whether there exists a complete set of mutually unbiased bases in an n-dimensional Hilbert space if "n" differs from a power of a prime (paper No. 41).

14/ The green corona intensities (530.3 nm), expressed in the coronal index of solar activity (CI) have been studied in the period 1939-2001. There was found an 11-year cycle periodicity in the CI; however, the disagreenment occurs beetwen the CI and sunspot number for some cycles. Subsidiary rotational rates of 25 and 33-days have been detected in the CI using the Fourier Transform Technique. The main rotational rate of the CI is of 27.3-days (paper No. 38).

15/ Analysis of the scatterd light in the Earth's atmosphere (called 'aureola'), acquired together with the green coronal intensity (530.3 nm) observations obtained at Lomnicky Stit since 1965, has shown that the aureola intensities do not vary with the solar cycle as it was generally accepted. (paper No. 40).

16/ A comparison of daily values of coronal holes (CH) in the green 530.3 nm coronal line intensity, as derived from the green coronal homegenous data series (HDS), with daily means of cosmic ray (CR) intensity during the 1953-2002 period shows a very good correlation of the CH and CR variations. The time shift between the CH and CR is 200 - 270 days with a maxima at 230 days. This indicates the potential for a possibility of using coronal emission data as one of the parameters for an eventual prediction of the level of cosmic ray flux at neutron monitor energies (paper No. 28).

17/ Evidence for the shocks waves, originating at the edges of the granules in the solar photosphere, was derived by an analysis of the spectroscopic observations of the solar granulation. For the first time evolution of this event and its relation to the concentration of the magnetic flux in the intergranular lane was documented. Comparison of the observational signatures of the shock wave in the spectral line profile of the ionised atom of iron with the results of the numerical magnetohydrodynamical modelling of the solar photosphere leads to an important agreement, which confirms results of the numerical simulations of convection on the surface of the Sun (paper No. 39).

18/ Basic vertical structure of the atmosphere of the UZ Lib primary was derived as based on spectroscopy from the season 1996-2000. The primary is a red giant with a high *vsini* value and possessing spots in its atmosphere. The secondary has significantly lower brightness. The study is based on static 1D spherical models applied to the hydrogen alpha profiles. The results for the primary component's atmosphere are the following: the photosphere, chromosphere and outer corona in agreement with solar analogy and sporadic energy flares and complex velocity fields. (paper No. 54).

19/ A long-term orbital period increase of the contact binary AK Her in 1892-2003 was explained either by a mass transfer between the components or by a light-time effect due to the presence of another body in the system. The 57-year modulation of this increase was caused by the presence of the third body with the mass of 0.22 solar masses. The 17.7-year variation of the orbital period was explained by cyclic changes of the presence of spots on the surface of this contact binary. (paper No. 10).

20/ Analysis of the long-term photometry of the symbiotic nova HM Sge obtained in 1975-2003 revealed that the maximum of brightness caused by the outburst in august 1975 was followed by two brightness minima with the duration of 750 and 2100 days. The second minimum was visible only in the U band. The minima were explained by the eclipses of the hot component and the hot shocked region formed by colliding winds of the components by a Mira type giant. (paper No. 23).

21/ Long-term photometry of the classical nova V723 Cas and symbiotic novae V1329 Cyg, PU Vul, V1016 Cyg and HM Sge was used to find their orbital periods. The arguments in favor of the presence of the third components in these systems and physical processes, responsible for brightness variations, were suggested. (paper No. 24).

22/ A third body in the semi-detached eclipsing binary star UX Her was detected from the observed minima behavior. The orbital elements and the minimum mass of the third body were determined. (paper No. 51).

23/ Photometric observations of 15 symbiotic stars, carried out mostly at the Skalnate Pleso and Stara Lesna observatories, showed unexpected variations in their light curves: outbursts, wave-like variations and effects due to eclipses. (paper No. 46).

24/ The effect of emission lines in the spectra of symbiotic stars and novae during their nebular phases was investigated. For the symbiotic nova V1016 Cyg it was found that 68, 78 and 66 percent of the observed flux in the U, B and V filters is radiated by emission lines. (paper No. 43).

25/ The nature of periodic variations in the star's brightness as a function of the orbital motion of binary components was discussed and the effect of apparent changes of orbital periods was described within photometric investigation of symbiotic stars. (paper No. 44).

26/ A model of spectral energy distribution in the ultraviolet, optical and infrared spectral region of the symbiotic stars BF Cyg and AG Dra during their phases of activity identified two types of outbursts. (paper No. 45).

27/ UBVRI CCD photometry of the symbiotic nova V1329 Cygni, obtained using 50cm telescope at Stara Lesna, revealed a sudden brightening of the object in August 2004. The flare has a largest amplitude in the U passband (0.41 mag). It is the first recorded flare of the object after the main outburst. The object reached quiescence brightness in about 3 months. (paper No. 71).

28/ Comparison of the observations of the eclipsing binary V685 Cen from the ASAS database and observations published by van Houten et al. (2003) clearly showed the difference in the minima depth. This observational fact was interpreted by the precession of the orbit of the eclipsing binary induced by a third component on a relatively close orbit. The rate of the precession indicates that the orbital period of the third component is shorter than one year and the precession period is several hundred years. Assumption of the third light markedly improved the light-curve solution. (paper No. 67).

29/ The light curves of the systems YY CrB and EQ Tau were analysed by the ROCHE code which was created by Dr. Pribulla. The light curve of the YY CrB is the first one observed from the Earth. After analysis of the light curves we obtained photometric elemets. In combination with published spectroscopic elements, we determined the absolute parameters of the systems. Having these results we created 3D models of the systems and discussed their evolutionary status. (paper No. 52).

30/ The new eclipsing symbiotic system YY Her was discovered and the secondary minimum was observed in detail. On the basis of CCD photometry in BVRI colours the increased photometric activity with consecutive outburst was detected in the system. The energy balance and time scales of particular events have been calculated. The observational material was obtained at the observatories in the frame of international photometric campaign in the Czech Republic and Slovakia (papers Nos. 21 and 22).

31/ The CCD photometric and spectroscopic observations of Nova Aql 1999 (V1493 Aql) were analysed. The orbital period of the system with the value of 3.7 hours, extremely large distance of the nova 34.4 ± 6.2 kpc and expansion velocity of the envelope 1660 ± 60 km/s was derived. (paper No. 16).

32/ Photometric and spectroscopic observations of HD 6226 led to a conclusion that it is a newly discovered bright Be star. The brightness and emission lines variability are well correlated. Based on the types of the observed variabilities the star was classified as a Be star of Gamma CMa type. (paper No. 11).

33/ High resolution spectra of the extreme helium subdwarf BD+254655 from the 6m SAO telescope were analysed using the NLTE model atmospheres. Basic parameters of the star were derived. (paper No. 13).

34/ Zeeman spectra of the double-lined double star HR6611 with Am components were analyzed. Previously in the literature suggested presence of magnetic field was not confirmed. (paper No. 82).

35/ Observed variations of metalic lines profiles in the H-alpha region of the roAp star HR3831 correspond to a non-uniform distribution of the elements over the surface of the rotating star. (paper No. 55).

36/ Secondary spectrum in the SB1 system HD861 was discovered. The secondary is a much fainter and cooler star, with a much lower rotation velocity than the primary star. This enabled us to estimate a preliminary mass ratio of about 2:1. (paper No. 57).

6 Grants/Projects

6.1 International grants

- 2001-2005, Project DFG - Solar granulation (project No. DFG 436 SLK113/7/0-1) - principal investigators: H. Wöhl, A. Kučera, J. Rybák
- 2003-2005, Project AV ČR-SAV - Research of cataclismic variables - project INTEGRAL - principal investigator: L. Hric
- 2004 - Projekt EGIDE 411867G/P392152B Sejour Scietifique de Haut Niveau Fellowship: Applications of Finite Geometries in Physics - principal investigator: M. Saniga
- 2001-2003, Project CNR-SAV - Physical and dynamical aspects of the evolution of short-period Comets - principal investigator: E. Pittich
- 2001-2003, Project CNR-SAV - Interplanetary bodies and atmospheric phenomena - principal investigator: V. Porubčan
- 2001-2003, Project CNR-SAV - Physical processes in active stars and search for their star and planetary companions - principal investigators: D. Chochol, T. Pribulla
- 2002-2005, Project CNR-SAV - Space weather and climatology - principal investigator: J. Sýkora
- 2002-2005, Project 'Processes of interaction in classical novae and symbiotic stars' of AI-SAS with the Astrophysics Research Institute, John Moores University, Liverpool - principal investigator: A. Skopal
- 2002-2006, Project EU HPRN-CT - European solar magnetism network - principal investigators: R. Rutten, A. Kučera
- 2004, Project OPTICON 2004/030 - DOT (6FP EU) - principal investigator: J. Koza
- 2004, Project 'VENUS TRANSIT 2004', project No. 508 963 (6FP EU) - principal coordinator: J. Koza
- 2004-2005, Project HPMT-CT-2001-00245 Marie Curie Host Fellowship programme, The Netherlands Research School for Astronomy (6FP EU) - principal investigator: P. Gömöry
- 2003-2004, USA NSF-NATO fellowship - Doppler tomography and radiative transfer in Algol type binaries - principal investigator: J. Budaj
- 2004, NATO Science Programme Sub-Programme: Expert visit 'Understanding the outburst stage of the symbiotic binary Z And' - principal investigator: A. Skopal
- 2003-2005, Slovak-Chinese project - Study of magnetic fields, corona and prominences in the solar corona over a solar cycle - principal investigator: V. Rušin
- 2003-2005, Slovak-Czech project (project No. MVTS 128/2004-12-20) The variability of cool magnetic stars and its origin - principal investigator: J. Zverko

- 2004-2006, USA-SK NSF project 'Space weather: numerical MHD study of CMEs: inicialization and propagation' - principal investigator: J. Rybák.

6.2 Grants of the Slovak Grant Agencies VEGA and APVT

- 2003-2005 - Distribution of chemical elements on the surface of chemically peculiar stars - principal investigator: J. Zverko
- 2003-2005 - Dynamical processes and energy transfer in the solar atmosphere - principal investigator: A. Kučera
- 2003-2005 - Cosmic dust, interplanetary and interstellar medium and their effects on the Earth and its atmosphere - principal investigator: A. Hajduk
- 2004-2006 - Dynamics and evolution of comets and asteroids from the point of their migration into regions of planetary orbits - principal investigator: E. Pittich
- 2004-2006 - Solar activity in the corona and prominences - principal investigator: V. Rušin
- 2004-2006 - The dynamical evolution and activity of the interplanetary bodies - principal investigator: J. Svoreň
- 2004-2006 - Zonal pecularities in the evolutionary processes on the Sun - principal investigator: J. Sýkora
- 2004-2006 - Study of the activity in the interacting binaries - principal investigator: A. Skopal
- 2004-2006 - The structure of the transmission reagions of the cataclysmic and related binaries - principal investigator: L. Hric
- 2002-2005 - Photometry of interacting binaries - principal investigator: D. Chochol
- 2002-2005 - Slovak photometric telescopes network for studies of selected physical processes in variable stars - principal investigator: L. Hric

6.3 Institute projects

- Radar studies of the faint component of the interplanetary matter - principal investigator: A. Hajduk
- Structure of meteor streams - principal investigator: V. Porubčan
- Cosmic dust - principal investigator: I. Kapišinský
- Dynamics of comets and asteroids and investigation of cometary dust - principal investigator: E. Pittich
- The astrometry of asteroids and the mutual interaction of interplanetary matter - principal investigator: L. Neslušan
- Photometry of comets and asteroids and cometary astrometry - principal investigator: J. Svoreň
- Study of variable phenomena of early spectral type stars and automatization of their observations - principal investigator: J. Žižňovský
- Chemically peculiar stars - principal investigator: J. Zverko

- Close binaries - principal investigator: D. Chochol
- Cataclismic variable stars - principal investigator: L. Hric
- Symbiotic stars - principal investigator: A. Skopal
- Solar eclipses - principal investigator: V. Rušin
- Solar protuberances and automatization of solar observations - principal investigator: M. Minarovjech
- Dynamics of solar photosphere and chromosphere - principal investigator: A. Kučera
- Solar cycle and Solar-terrestrial relations - principal investigator: J. Sýkora
- Outer layers of the solar atmosphere - principal investigator: J. Rybák

7 List of publications

7.1 Books and book chapters published in Slovakia

1. HRIC, Ladislav: Premenné hviezdy. In: Astronomická ročenka 2005, ed. E. Pittich, Slovenská ústredná hvezdáreň, Hurbanovo, 2004, p. 187-204 (in Slovak).

2. PITTICH, Eduard: Čas, obloha od januára do decembra. In: Astronomická ročenka 2005, ed. E. Pittich, Slovenská ústredná hvezdáreň, Hurbanovo, 2004, p. 3-89 (in Slovak).

3. PITTICH, Eduard: Pohyb planét po oblohe, elongácie a jasnosti, Mesiac krátko po nove. In: Astronomická ročenka 2005, ed. E. Pittich, Slovenská ústredná hvezdáreň, Hurbanovo, 2004, p. 90-103 (in Slovak).

4. PITTICH, Eduard: Galileiho mesiace. In: Astronomická ročenka 2005, ed. E. Pittich, Slovenská ústredná hvezdáreň, Hurbanovo, 2004, p. 164-177 (in Slovak).

5. PITTICH, Eduard: Kométy. In: Astronomická ročenka 2005, ed. E. Pittich, Slovenská ústredná hvezdáreň, Hurbanovo, 2004, p. 106-149 (in Slovak).

6. PITTICHOVÁ, Jana: Kométy roka 2003. In: Astronomická ročenka 2005, ed. E. Pittich, Slovenská ústredná hvezdáreň, Hurbanovo, 2004, p. 252-299 (in Slovak).

7. Porubčan, Vladimír:: Meteorické roje. In: Astronomická ročenka 2005, ed. E. Pittich, Slovenská ústredná hvezdáreň, Hurbanovo, 2004, p. 104-105 (in Slovak).

8. SVOREŇ, Ján: Rodiny asteroidov. In: Astronomická ročenka 2005, ed. E. Pittich, Slovenská ústredná hvezdáreň, Hurbanovo, 2004, p. 150-163 (in Slovak).

7.2 Book chapters published abroad

9. BUCCHERI, R. - JAROSZKIEWICZ, G. - SANIGA, Metod: Endophysics, the fabric of time and the self-evolving universe. In: Recent Research Developments in Astronomy and Astrophysics, Trivandrum: Research Signpost, 2003, p. 609-623.

7.3 Papers in journals indexed in Current Contents

10. AWADALLA, N. - CHOCHOL, Drahomír - HANNA, M. - PRIBULLA, Theodor: Orbital period study of AK Her. In: Contributions of the Astronomical Observatory Skalnaté Pleso, vol. 34, no. 1, 2004, p. 20-32.

11. BOŽIC, H. - HARMANEC, P. - YANG, S. - ŽIŽŇOVSKÝ, Jozef - PERCY, J.R. - RUŽDJAK, D. - SUDAR, D. - ŠLECHTA, M. - ŠKODA, P. - KRPATA, J. - BUIL, C.: Properties and nature of Be Stars. XXII. Long-term light and spectral variations of the new bright Be star HD 6226, In: Astronomy and Astrophysics. vol. 416, 2004, p. 669-676.

12. BUDAJ, Ján - RICHARDS, M.T.: A description of the SHELLSPEC code. In: Contributions of the Astronomical Observatory Skalnaté Pleso, vol. 34, no. 3, 2004, p. 167-196.

13. BUDAJ, Ján - ELKIN, V. - HUBENÝ, I.: Preliminar analysis of an extreme hellium sdO star: BD+25 4655. In: Astronomical Society of Pacific Conference Series, vol. 210, 2003, p. 1-5.

14. DOBROTKA, A. - HRIC, Ladislav - PETRÍK, K.: Fluctuation of the mass transfer rate in T CBr. In: Baltic Astronomy, vol. 13, 2004, p. 159-162.

15. DOBROTKA, A. - HRIC, Ladislav - PETRÍK, K.: The new view of the long-term flickering in T CrB. In: Revista Mexicana de Astronomia y Astrofisica serie de conferencias, vol. 20, 2004, p. 235-235.

16. DOBROTKA, A. - RETTER, A. - HRIC, Ladislav - NOVAK, R. - SHEMMER, O. - LIPKIN, Y.: V1493 Aql an extremely distant nova? In: Revista Mexicana de Astronomia y Astrofisica serie de conferencias, vol. 20, 2004, p. 236-236.

17. FRIEDJUNG, M. - GÁLIS, R. - HRIC, Ladislav - PETRÍK, K.: Confirmation of the second period of AG Dra in radial velocity. In: Astronomical Society of Pacific Conference Series, vol. 303, 2003, p. 125-128.

18. GÁLIS, R. - HRIC, Ladislav - PETRÍK, K.: Long-term photometric and spectroscopic behaviour of symbiotic system AG Dra. In: Revista Mexicana de Astronomia y Astrofisica serie de conferencias, vol. 20, 2004, p. 242-242.

19. GÁLIS, R. - HRIC, Ladislav - PETRÍK, K.: Long-term photometric and symbiotic behaviour of a symbiotic ststem AG Dra. In: Baltic Astronomy, vol. 13, 2004, p. 132-137.

20. HRIC, Ladislav - GÁLIS, R. - DOBROTKA, A.: An active quarter of the century in research of cataclismic variables. In: Baltic Astronomy, vol. 13, 2004, p. 87-92.

21. HRIC, Ladislav - GÁLIS, R. - DOBROTKA, A. - ŠIMON, V. - PETRÍK, K. - NIARCHOS, P. - VELIČ, Z. - GAZEAS, K. - ŠMELCER, L. - HÁJEK, P. - SOBOTKA, P. - KOSS, K. - BRÁT, L. - LOMOZ, F.: New clues on the model of YY her after two seasons. In: Revista Mexicana de Astronomia y Astrofisica serie de conferencias, vol. 20, 2004, p. 222-222.

22. HRIC, Ladislav - PETRÍK, K. - NIARCHOS, P. - GAZEAS, K. - GÁLIS, R. - VELIČ, Z. - ŠMELCER, L. - HÁJEK, P. - KOSS, K. - ŠIMON, V. - SOBOTKA, P. - BRÁT, L. - LOMOZ, F.: YY Herculis: a new eclipsing symbtioting system. In: Astronomical Society of Pacific Conference Series, vol. 303, 2003, p. 223-227.

23. CHOCHOL, Drahomír - PARIMUCHA, Š. - PRIBULLA, Theodor - SHUGAROV, S. Yu.: Long-term photometry of the symbiotic nova HM Sge. In: Contributions of the Astronomical Observatory Skalnaté Pleso, vol. 34, no. 1, 2004, p. 5-19.

24. CHOCHOL, Drahomír - PRIBULLA, Theodor - PARIMUCHA, Š. - VAŇKO, Martin: Long-term photometry of very slow novae. In: Baltic Astronomy, vol. 12, 2003, p. 610-615.

25. KOCIFAJ, Miroslav: Interstellar dust extinction problem: benchmark of (semi)analytic approaches and regularization period. In: Contributions of the Astronomical Observatory Skalnaté Pleso, vol. 34, no. 3, 2004, p. 141-156.

26. KOCIFAJ, Miroslav - KLAČKA, J.: Dynamical behaviour of interstellar dust particles in solar system. In: Journal of Quantitative Spectroscopy and Radiative Transfer, vol. 89, 2004, p. 165-177.

27. KOCIFAJ, Miroslav - KLAČKA, J.: The capture of interstellar dust: the Lorentz force case. In: Planetary and Space Science, vol. 52, 2004, p. 839-847.

28. MINAROVJECH, Milan - RUŠIN, Vojtech - RYBANSKÝ, M. - KUDELA, K. - KOLLÁR, V.: An approach to space weather studies from ground based observations. In: Contributions of the Astronomical Observatory Skalnaté Pleso, vol. 34, no. 3, 2004, p. 197-203.

29. NESLUŠAN, Luboš: The significance of the Titius-Bode law and the peculiar location of the Earth's orbit. In: Monthly Notices of Royal Astronomical Society, vol. 351, 2004, p. 133-136.

30. NESLUŠAN, Luboš - JAKUBÍK, Marian: The tidal action of the homogeneous field of Galactic-disc matter and population of the outer Oort cloud. In: Contributions of the Astronomical Observatory Skalnaté Pleso, vol. 34, no. 2, 2004, p. 87-104.

31. PARIMUCHA, Š. - CHOCHOL, Drahomír - PRIBULLA, Theodor - BUSON, L.M. - VITTONE, A.A.: Fifteen-year period of activity in the symbiotic nova V1016 Cyg. In: Astronomical Society of Pacific Conference Series, vol. 303, 2003, p. 80-84.

32. PARIMUCHA, Š - VAŇKO, Martin: Multiwavelength variability in the symbiotic nova V1016 Cyg. In: Revista Mexicana de Astronomia y Astrofisica serie de conferencias, vol. 20, 2004, p. 224-224.

33. PITTICH, Eduard, M. - D'ABRAMO, G. - VALSECCHI, G.B.: From Jupiter-family to Encke-like orbits. The role of non-gravitational forces and resonances. In: Astronomy and Astrophysics, vol. 422, 2004, p. 369-375.

34. PORUBČAN, Vladimír - HAJDUK, Anton - CEVOLANI, G. - PUPILLO, G.: The Leonid meteor shower 1996-2002: Results from forward-scatter radio observations. In: Il Nuovo Cimento, vol. 26C, no. 6, p. 679-683.

35. PRIBULLA, Theodor - CHOCHOL, Drahomír: High-precision UBVRI photometry with a new 50 cm telescope at Stará Lesná. In: Baltic Astronomy, vol. 12, 2003, p. 555-560.

36. PRIBULLA, Theodor - CHOCHOL, Drahomír: Photometric and spectroscopic study of the symbiotic Nova V1329 Cyg. In: Astronomical Society of Pacific Conference Series, vol. 303, 2003, p. 245-248.

37. PUPILLO, G. - PORUBČAN, Vladimír - CEVOLANI, G. - BORTOLOTTI, G. - FRANCESCHI, C. - TRIVELLONE, G. - ZIGO, P. - HAJDUK, Anton: The Quadrantid meteor shower 1997-2004: Activity and mass distribution. In: Il Nuovo Cimento, vol. 27C, no. 2, p. 213-217.

38. RUŠIN, Vojtech - RYBANSKÝ, M. - MINAROVJECH, Milan: The 530,3 nm corona irradiance from 1939 to 2001. In: Advances in Space Research, vol. 34, 2004, p. 251-255.

39. RYBÁK, Ján - WÖHL, H. - KUČERA, Aleš - HANSLMEIER, A. - STEINER, O.: Indications of shock waves in the solar photosphere. In: Astronomy and Astrophysics, vol. 420, 2004, p. 1141-1152.

40. SAKURAI, T. - RUŠIN, Vojtech - MINAROVJECH, Milan: Solar-cycle variation of near-sun sky brightness observed with coronagraphs. In: Advances in Space Research, vol. 34, 2004, p. 297-301.

41. SANIGA, Metod, - PLANAT, M. - ROSU, H.: Mutually unbiased bases and finite projective planes. In: Journal of Optics B: Quantum and Semiclassical Optics, vol. 6, 2004, p. L19-L20.

42. SANIGA, Metod: On an intriguing signature-reversal exhibited by Cremonian space-times. In: Chaos, Solitons and Fractals, vol. 19, 2004, p. 739-741.

43. SKOPAL, Augustín: Correction of UBV photometry for emission lines. In: Baltic Astronomy, vol. 12, 2003, p. 604-609.

44. SKOPAL, Augustín: The impact of photometric observations on symbiotic star research. In: Astronomical Society of Pacific Conference Series, vol. 303, 2003, p. 92-96.

45. SKOPAL, Augustín - BALUĎANSKÝ, D.: Two types of outbursts in symbiotic binaries. In: Astronomical Society of Pacific Conference Series, vol. 303, 2003, p. 249-253.

46. SKOPAL, Augustín - PRIBULLA, Theodor - VAŇKO, Martin - VELIČ, Z. - SEMKOV, E. - WOLF, M. - JONES, A.: Photometry of symbiotic stars XI. EG And, Z and, BF Cyg, CH Cyg, CI Cyg, V1329 Cyg, TX CVn, AG Dra, RW Hya, AR Pav, AG Peg, AX Per, QW Sge, IV Vir and the LMXB V934 Her. In: Contributions of the Astronomical Observatory Skalnaté Pleso, vol. 34, no. 1, 2004, p. 45-69.

47. SKOPAL, Augustín - VAŇKO, Martin - PRIBULLA, Theodor - CHOCHOL, Drahomír: Recent UBVR photometry of symbiotic stars. In: Baltic astronomy, vol. 12, 2003, p. 631-632.

48. SOLOVAYA, N.A. - PITTICH, Eduard M.: The dynamical stability of extra-solar planets in binary systems. In: Contributions of the Astronomical Observatory Skalnaté Pleso, vol. 34, no. 2, 2004, p. 105-118.

49. SVOREŇ, Ján: Astrometry of minor planets made at the Skalnaté Pleso Observatory in the year 1985. In: Contributions of the Astronomical Observatory Skalnaté Pleso, vol. 34, no. 1, 2004, p. 71-80.

50. TEMMER, M. - VERONIG, A. - RYBÁK, Ján - BRAJŠA, R. - HANSLMEIER, A.: On the 24-day period observed in solar flare occurrence. In: Solar Physics. vol. 221, 2004, p. 325-335.

51. TREMKO, Jozef - KREINER. J.M. - PRIBULLA, Theodor: The third body in the system UX Her. In: Contributions of the Astronomical Observatory Skalnaté Pleso, vol. 34, no. 1, 2004, p. 33-44.

52. VAŇKO, Martin - PARIMUCHA, Š. - PRIBULLA, Theodor - CHOCHOL, Drahomír: New parameters of the contact binary systems YY CRB and EQ TAU. In: Baltic Astronomy, vol. 13, 2004, p. 151-155.

53. ZBORIL, Milan - DJURAŠEVIČ, G.: SV Cam spot activity in December 2003. In: Contributions of the Astronomical Observatory Skalnaté Pleso, vol. 34, no. 2, 2004, p. 128-134.

54. ZBORIL, Milan - STRASSMEIER, K.G. - AVRETT, E.H.: An atmospheric model for UZ Librae from mean Halfa-line profiles. In: Astronomy and Astrophysics, vol. 421, 2004, p. 295-303.

55. ŽIŽŇOVSKÝ, Jozef - ZVERKO, Juraj - ŠKREKA, M. - POLOSUCHINA, N.S.: Search for rapid variability of metallic lines in the H alpha region of HR 3831. In: Astronomical Society of Pacific Conference Series, vol. 210, 2003, p. 1-5.

7.4 Papers in other journals

56. ANDRONOV, I.L. - ANTONIUK, K.A. - AUGUSTO, P. - BAKLANOV, A.V. - CHINAROVA, L. L. - CHOCHOL, Drahomír - EFIMOV, YU.S. - GAZEAS, K. - HALEVIN, A.V. - KIM, Y. - KOLESNIKOV, S.V. - KUDASHKINA, L.S. - MARSAKOVA, V.I. - MASON, P.A. - NIARCHOS, P.G. - NOGAMI, D. - OSTROVA, N.I. - PATKOS, L. - PAVLENKO, E.P. - SHAKHOVSKOY, N.M. - TREMKO, Jozef - YUSHCHENKO, A.V. - ZOLA, S.: Inter-longitude astronomy project: some results and perspectives. In: Astronomical and Astrophysical Transactions, vol. 22, no. 4-5, 2003, p. 793-798.

57. BUDAJ, Ján - ILIEV, I.K.H. - FEŇOVČÍK, M. - BARZOVA, I. - RICHARDS, M.T. - GEORDZHEVA, E.: Discovery of the secondary in the spectrum of the SB1 system HD861. In: Information Bulletin on Variable Stars. no. 5509, 2003, p. 1-4.

58. HAJDUK, Anton: Meranie rýchlostí jemných medziplanetárnych častíc. In: Meteorické správy, vol. 25, 2004, p. 11-13 (in Slovak).

59. HAJDUKOVÁ, Mária, Jr.: Extremely high velocity meteoroids in IAU MDC radar data. In: Acta Astronomica et Geophysica Universitatis Comenianae, vol. 25, 2004, p. 29-34.

60. HAJDUKOVÁ, Mária, Jr.: Highly hyperbolic orbits in the IAU MDC photographic data. In: Acta Astronomica et Geophysica Universitatis Comenianae, vol. 25, 2004, p. 23-28.

61. HUSÁRIK, Marek: CCD fotometria asteroidov (787) Moskva, (1095) Tulipa a (1257) Mora. In: Meteorické správy, vol. 25, 2004, p. 45-51 (in Slovak).

62. JAKUBÍK, Marian: Početnost' populácie komét v Oortovom oblaku a jeho hmotnost'. In: Meteorické správy, vol. 25, 2004, p. 14-22 (in Slovak).

63. KAPIŠINSKÝ, Igor - CEVOLANI, G. - IŽDINSKÝ, K. - PÁNEK, Z. - ZEMÁNKOVÁ, M.: Supplement to the analyses of the Fermo meteorite. In: Contributions to Geophysics and Geodesy, vol. 34, no. 1, 2004, p. 67-79.

64. KAPIŠINSKÝ, Igor - CEVOLANI, G. - FUNAKI, M. - ORLICKÝ, O. - PORUBČAN,

Vladimír - TÚNYI, I.: On some magnetic properties of the Fermo H-chondrite. In: Contributions to Geophysics and Geodesy, vol. 33, no. 4, 2003, p. 241-245.

65. KAPIŠINSKÝ, Igor - FUNAKI, M. - ORLICKÝ, O. - TÚNYI, I.: Complementary study of some magnetic properties of selected well known meteorites. In: Contributions to Geophysics and Geodesy, vol. 34, no. 3, 2004, 275-287.

66. KUČERA, Aleš - KOZA, Július - BELLOT RUBIO, L.R. - HANSLMEIER, A. - RYBÁK, Ján - WÖHL, H.: Velocity field in the intergranular atmosphere. In: Hvar Observatory Bulletin, vol. 28, 2004, p. 19-26.

67. MAYER, P. - PRIBULLA, Theodor - CHOCHOL, Drahomír: Variable depths of minima of the eclipsing binary V685 Cen. In: Bulletin on Variable Stars, no. 5563, 2004, p. 1-4.

68. NESLUŠAN, Luboš: Typické veľkosti kometárnych jadier. In: Meteorické správy, vol. 25, 2004, p. 35-38 (in Slovak).

69. NESLUŠAN, Luboš: Uhlové elementy dráh nových komét. In: Meteorické správy, vol. 25, 2004, p. 29-34 (in Slovak).

70. PORUBČAN, Vladimír- KORNOŠ, L.: Potenciálne asociácie NEA objektov s meteorickými prúdmi. In: Meteorické správy, vol. 25, 2004, p. 52-58 (in Slovak).

71. PRIBULLA, Theodor - CHOCHOL, Drahomír - PARIMUCHA, Š. - VAŇKO, Martin: Eruption in the symbiotic nova V1329 Cygni. In: Information Bulletin on Variable Stars, no. 5513, 2004, p. 1-4.

72. RYBÁK, Ján - BENDÍK, Pavol - TEMMER, M. - VERONIG, A. - HANSLMEIER, A.: Merging two data sets of hemispheric sunspot numbers. In: Hvar Observatory Bulletin, vol. 28, 2004, p. 63-70.

73. SVOREŇ, Ján - HUSÁRIK, Marek: Kvantitatívny popis stupňov kondenzácie kometárneho obrazu. In: Meteorické správy, vol. 25, 2004, p. 23-28 (in Slovak).

74. SVOREŇ, Ján - KAŇUCHOVÁ, Zuzana: Jemná štruktúra prúdu Perzeíd a rezonancie s Jupiterom a Saturnom. In: Meteorické správy, vol. 25, 2004, p. 1-10 (in Slovak).

75. SVOREŇ, Ján - KORNOŠ, L. - RYCHTARĆÍK, P. - ČERVÁK, G.: Observations of minor planets. In: Minor Planet Circular, no. 49881, 2003.

76. SVOREŇ, Ján - KORNOŠ, L. - RYCHTARĆÍK, P. - ČERVÁK, G.: Observations of minor planets. In: Minor Planet Circular, no. 51499, 2004.

77. TEMMER, M. - VERONIG, A. - RYBÁK, Ján - BRAJŠA, R. - HANSLMEIER, A.: Importance of magnetically complex active regions on solar flare occurrence. In: Hvar Observatory Bulletin, vol. 28, 2004, p. 95-102.

78. WÖHL, H. - BRAJŠA, R. - KUČERA, Aleš - RUŽDJAK, V. - RYBÁK, Ján: Proper motions of sunspots: new data and further results. In: Hvar Observatory Bulletin, vol. 28, 2004, p. 47-54.

79. ZBORIL, Milan - DJURAŠEVIČ, G.: Differential photometry of AW Vir in April 2004. In: Information Bulletin on Variable Stars, no. 5574, 2004, p. 1-2.

7.5 Contributions to the refereed proceedings

80. GÖMÖRY, Peter - RYBÁK, Ján - KUČERA, Aleš - CURDT, W. - WÖHL, H.: On mutual relation among the outer atmospheric layers in network: SOHO/CDS study. In: Proceedings of SOHO 13 'Waves, Oscillations and Small-Scale Transients Events in the Solar Atmosphere: A Joint View from SOHO and TRACE', Palma de Mallorca, Spain, 29 September - 3 October 2003, Noordwijk: ESA Publications Division, 2004, p. 303-307.

81. HRIC, Ladislav - PETRÍK, K. - NIARCHOS, P. - GÁLIS, R.: The eclipsing cataclismic triple system V471 Tau. In: Proceedings of a conference 'Stellar Astrophysics': a Tribute to Helmut A. Abt, Sixth Pacific Rim Conference, Xian, China, Dordrecht, Kluwer Academic Publishers, 2003, p. 207-211.

82. MIKULÁŠEK, Z. - ZVERKO, Juraj - ROMANYUK, I.I. - ŽIŽŇOVSKÝ, Jozef - ELKIN, V.G. - KUDRYAVTSEV, D.O.: Spectroscopy study of the Am SB2 eclipsing binary HR6611. In: Proceeding of the International Conference 'Magnetic Stars', Nizhnyj Arkhyz, Russia, 27-31 August 2003, Nizhnyj Arkhyz, Special Astrophysical Observatory, Russian Academy of Sciences, 2004, p. 181-189.

83. RYBÁK, Ján - KUČERA, Aleš - CURDT, W. - WÖHL, H.: On relations among the calibrated parameters of the transition region spectral line. In: Proceedings of SOHO 13 'Waves, Oscillations and Small-Scale Transients Events in the Solar Atmosphere: A Joint View from SOHO and TRACE', Palma de Mallorca, Spain, 29 September - 3 October 2003, Noordwijk: ESA Publications Division, 2004, p. 311-316.

84. ROSU, H.C. - PLANAT, M. - SANIGA, Metod: MUBs: From finite projective geometry to quantum phase enciphering. In: Proceedings of the Conference Quantum Communication, Mesaurement and Computing, Glasgow, United Kingdom, 24-29 August 2004, Boston, American Institute of Physics, 2004, p. 315-318.

85. TAMURA, S. - MASAAKI, O. - SKOPAL, Augustín - PRIBULLA, Theodor - VAŇKO, Martin: Spectroscopic diagnosis on symbiotic star Z And during recent outburst phase. In: Proceedings of a conference 'Stellar Astrophysics: a Tribute to Helmut A. Abt', Sixth Pacific Rim Conference, Xian, China, Dordrecht, Kluwer Academic Publishers, 2003, p. 213-217.

86. TOMASZ, František - RYBÁK, Ján - KUČERA, Aleš - CURDT, W. - WÖHL, H.: SUMER/SOHO and TRACE study of the transition region blinker. In: Proceedings of SOHO 13 'Waves, Oscillations and Small-Scale Transients Events in the Solar Atmosphere: A Joint View from SOHO and TRACE', Palma de Mallorca, Spain, 29 September - 3 October 2003, Noordwijk: ESA Publications Division, 2004, p. 307-310.

87. ZVERKO, Juraj: Spectrum variability of CP stars. In: Proceeding of the International Conference 'Magnetic Stars', Nizhnyj Arkhyz, Russia, 27-31 August 2003, Nizhnyj Arkhyz, Special Astrophysical Observatory, Russian Academy of Sciences, 2004, p. 90-93.

88. ŽIŽŇOVSKÝ, Jozef: Photometric variability of CP stars. In: Proceeding of the International Conference 'Magnetic Stars', Nizhnyj Arkhyz, Russia, 27-31 August 2003, Nizhnyj Arkhyz, Special Astrophysical Observatory, Russian Academy of Sciences, 2004, p. 81-89.

7.6 Contributions to the non-refereed proceedings

89. HRIC, Ladislav: Venuša a jej prechody pred slnečným diskom. In: Seminár VENUS TRANSIT 2004, Tatranská Lomnica, Astronomický ústav SAV, Tatranská Lomnica, 2004, p. 64-70 (in Slovak).

90. KOZA, Július: Registrácia a protokol o výsledku pozorovania. In: Seminár VENUS TRANSIT 2004, Tatranská Lomnica, Astronomický ústav SAV, Tatranská Lomnica, 2004, p. 5-11 (in Slovak).

91. KOZA, Július: Projekčná metóda pozorovania pomocou triédra. In: Seminár VENUS TRANSIT 2004, Tatranská Lomnica, Astronomický ústav SAV, Tatranská Lomnica, 2004, p. 44-47 (in Slovak).

92. NESLUŠAN, Luboš: Prechod Venuše popred disk Slnka 8. júna 2004, využitie javu na určenie slnečnej paralaxy - súvisiace pojmy a výpočty. In: Seminár VENUS TRANSIT 2004, Tatranská Lomnica, Astronomický ústav SAV, Tatranská Lomnica, 2004, p. 14-26 (in Slovak).

93. HRIC, Ladislav: Venuša a jej prechody pred slnečným diskom. In: Seminár VENUS TRANSIT 2004, Tatranská Lomnica, Astronomický ústav SAV, Tatranská Lomnica, 2004, p. 64-70 (in Slovak).

8 How to reach us

8.1 Headquarters and facilities in the High Tatras

Postal address:	Astronomical Institute, Slovak Academy of Sciences, SK-05960 Tatranská Lomnica, Slovakia
Telephone	421 52 4467866-8 (headquarters – secretary) 421 52 4467062 (Skalnaté Pleso Observatory) 421 52 4467072 (Lomnický Štít Observatory)
Fax	421 52 4467656
E-mail:	astroinst@astro.sk
Staff email addresses:	`surnameofperson@astro.sk`
World Wide Web:	http://www.astro.sk
Anonymous ftp:	ftp.ta3.sk

8.2 Facility in Bratislava

Postal address:	Astronomical Institute, Department of Interplanetary Matter, Slovak Academy of Sciences, Dúbravská cesta 9, SK-84504 Bratislava, Slovakia
Telephone	421 2 54775157 (secretary)
Fax	421 2 54775157
E-mail:	admin@astro.savba.sk
Staff email addresses:	`surnameofperson@astro.sk` or `surnameofperson@astro.savba.sk`
World Wide Web:	http://astro.savba.sk