

NATIONAL TARAS SHEVCHENKO UNIVERSITY OF KYIV
DEPARTMENT OF ASTRONOMY AND SPACE PHYSICS

17th Young Scientists' Conference
on Astronomy and Space Physics
Abstracts

Kyiv, 2010

Organizing Committee

Scientific Organizing Committee

Vasyl M. Ivchenko (chair), Kyiv, Ukraine
Vasyl Ya. Choliy (co-chair), Kyiv, Ukraine
Gennadi P. Milinevsky, Kyiv, Ukraine
Bohdan I. Hnatyk, Kyiv, Ukraine
Nikolai N. Samus, Moscow, Russia
Klim I. Churyumov, Kyiv, Ukraine
Nataliya G. Shchukina, Kyiv, Ukraine
Ivan L. Andronov, Odessa, Ukraine
Peter P. Berczik, Kyiv, Ukraine

International Advisory Committee

Bogdan Wszolek, Czestochowa, Poland
Anatoliy M. Cherepashchuk, Moscow, Russia
Marcus Kirsch, Darmstadt, Germany
Siegfried Franck, Potsdam, Germany

Local Organizing Committee

Grygorii Polinovskyi (chair)
Ganna Ivashchenko (secretary)
Oleksandr Shuyenko (co-chair)
Mykola Malygin
Antonina Klyueva
Margaryta Sobolenko
Andrew Simon
Ievgen Vovk
Oleksiy Ivanyuk
Sergey Zaitsev
Katerina Agienko
Daria Dubinovska
Volodymyr Masliukh

Address for correspondence:

YSC, P.O.Box 7, Kyiv-22, 03022, Ukraine
e-mail: ysc@univ.kiev.ua

Address:

Astronomy and Space Physics Department,
Faculty of Physics,
National Taras Shevchenko University of Kyiv,
Glushkova ave., 2, Kyiv, 03127, Ukraine.
Phone: +(380) 44-526-44-57
Fax: +(380) 44-526-45-07

17th Young Scientists' Conference on Astronomy and Space Physics

Preface

This year Young Scientists' Conference on Astronomy and Space Physics is held for the seventeenth time. We all have been looking forward to the annual meeting of astronomers at National Taras Shevchenko University of Kyiv. Now it has friendly opened its doors for participants from all over the world.

Young Scientists' Conference has a long history. The first meeting was organized by Physics faculty of National Taras Shevchenko University of Kyiv as a students' conference in 1994. Since 1996 our conference has welcomed young researchers from other universities and scientific institutions. During 1994-2009 participants from Ukraine, Russia, Poland, France, Germany, Spain, Sweden, Libya, Egypt, Japan, Finland, Turkey, China, Slovakia, Armenia, USA and other countries participated in Young Scientists' Conference.

The conference is aimed at strengthen the position of astronomy and promote space physics research. The lectures and reports presented by the participants traditionally reflect modern trends and actual problems of the science, the sessions facilitate informational exchange about the latest innovations and achievements.

On behalf of the organizing committee we would like to express our gratitude to the invited lecturers and participants for contributing lectures and reports. We are especially grateful to Prof. V.M. Ivchenko for the help in conference organization.

*Grygorii Polinovskyi and
Local Organizing Committee*

PROGRAMME

Monday, April, 26

10.00-14.00 - Registration
14.15-14.35 - Official opening.

Section 'Solar System & Extrasolar Planets'

- 14.35-15.20 **Siegfried Franck** *How Many Habitable Planets Are There in the Milky Way?* (invited)
- 15.20-15.50 Tea-break
- 15.50-16.05 **Joanna Drazkowska**, M. Hanasz, K. Kowalik *Particle Module of Piernik MHD Code* (12+3)
- 16.05-16.20 **Anna Rozenkiewicz** *Modeling of Stellar Radial Velocities with the Genetic Algorithms* (12+3)
- 16.20-16.35 **Beata Deka** *Ecospheres around Binary Stars* (12+3)
- 16.35-16.50 **Wieżysław Bykowski** *The Monitoring of the Transiting Exoplanet WASP-12 b* (12+3)
- 16.50-17.05 **Nadiia Kostogryz** *Vertical Distribution of Scattering Optical Depth in the Uranus' Atmosphere* (12+3)
- 17.05-17.20 **Sergii Zaitsev** *The Phase-Angle and Longitude Dependence of Polarization for Iapetus near Opposition* (12+3)
- 17.20-17.35 **Sergey Karashevich**, I. A. Verestchagina, E. N. Sokov, V. Yu. Slesarenko, A. V. Devyatkin *Observations and Research of Minor Solar System Bodies* (12+3)
- 17.35-17.50 **Remigiusz Pospieszynski** *Design Process of Ion Optics for Laplace's Plasma Dynamics Analyzer* (12+3)
- 17.50-17.55 **Alexey Koltsov**, A. V. Ivantsov *Search of New Asteroids and TNO's Using Observations of the Short Period of Time* (poster)
- 17.55-18.00 **Olexandr Baransky**, K. I. Churyumov, V. O. Ponomarenko *Some Results of Investigation of Eighteen Fragments of Comet 73P Schwassmann-Wachmann 3 Nuclues* (poster)
- 18.00-18.05 **Vasyl Ponomarenko**, K. I. Churyumov, O. R. Baransky *Exploration of Bright Comet C/2007 N3 (Lulin) Observed in February 2009* (poster)
- 18.05-18.10 **Vasyl Ponomarenko**, K. I. Churyumov, O. R. Baransky, V. V. Kleshchonok, I. V. Lukyanyk, L. S. Chubko *Spectral Observations of Two Comets C/2006 W3 (Christensen) and 22P Kopff* (poster)
- 18.10-18.15 **Oksana Tvorun**, A. A. Berezhnoy *The Chemistry of Meteor Events on Mars* (poster)
- 18.15-18.20 **Alex Tudorica**, O. Vaduvescu, M. Birlan *EURONEAR – The First 200 NEA's Observed* (poster)
- 18.30-21.00 Excursion to the Main Astronomical Observatory of NAS of Ukraine

Tuesday, April, 27

Section 'Stellar Astrophysics'

- 09.30-09.45 **Daria Teplykh**, V. M. Malofeev, O. I. Malov *Pulsed Radio Emission from Two XDINS at Low Frequencies (12+3)*
- 09.45-10.00 **Elena Nikitina**, I. F. Malov *Estimations of Angles between Some Axes in Radio Pulsars from the Catalog at 1000 MHz (12+3)*
- 10.00-10.15 **Maxim Kuznetsov** *New Spectral Classification of Ultracool Dwarfs (12+3)*
- 10.15-10.30 **Julia Solomennyk**, B. Hnatyk, V. Marchenko *Analytical Description of Relativistic Shock Wave Dynamics in Stellar Envelopes (12+3)*
- 10.30-11.00 Tea-break
- 11.00-11.45 **Nikolay Samus** *Discovery and Study of New Variable Stars Using Digitized Plates from Moscow Stacks (invited)*
- 11.45-12.00 **Wieslaw Zajiczek** *Lie Symmetries of Relativistic Equations of Stellar Structure for Radiative Energy Transport (12+3)*
- 12.00-12.15 **Dmitry Nasonov** *Spectroscopy of Post-AGB Star IRAS01005+7910 (12+3)*
- 12.15-12.30 **Taisiya Kopytova**, V. V. Krushinsky, E. Gorboskoy et al. *Polarimetry of GRB-091020 and GRB-091127 (12+3)*
- 12.30-12.35 **Svjatoslav Smerechynskyj**, M. V. Vavrukh, N. L. Tyshko *Relation "Energy-Radius" in the Chandrasekhar Model and Degenerated Dwarfs Distribution by Radii (poster)*
- 12.35-12.40 **Oksana Stelmakh**, M. V. Vavrukh *Calculation of the Ionization Balance in the Photosphere of Stars with Allowance for Screening Interactions (poster)*
- 12.40-12.45 **Andrew Simon** *The First Spectra for the RX J0440.9+4431 from 2-m Terscol Telescope (poster)*
- 12.45-12.50 **Andrew Simon**, N. Metlova, V. Reshetnyk *Photometric Investigation of the 1H1935+55 and the Nearest Sky Field (poster)*
- 15.00-18.00 City tour (by bus)
- 18.00-22.00 Kyiv by night (walking tour)

Wednesday, April, 28

Section 'Extragalactic Astrophysics'

- 09.30-09.45 **Salomé Pereira de Matos** *Selection of Luminous Galaxies at the Edge of the Universe (12+3)*
- 09.45-10.00 **Evgeniya Shaldenkova** *Atomic Hydrogen Deficiency in Spiral Galaxies in Clusters (12+3)*
- 10.00-10.15 **Vasiliy Vitrishchak**, D. C. Gabuzda, I. N. Pashchenko *Circular Polarisation of AGNs on the Parsec VLBI Scales (12+3)*

17th Young Scientists' Conference on Astronomy and Space Physics

10.15-10.30 Ilya Pashchenko, S. V. Pilipenko, V. M. Vitrishchak *Seyfert Galaxies and "Unified Scheme"* (12+3)

10.30-11.00 Tea-break

11.00-11.45 Svitlana Zhukovska *Dust Formation and Cycle in Galaxies* (invited)

11.45-12.00 Maryna Mykhailova, V. M. Kontorovich *Influence of Low-Frequency Quasar 3C 273 Radio Spectrum on X-ray Emission of Its Kiloparsec Jet* (12+3)

12.00-12.15 Juan-Pablo Perez-Beaupuits, M. Spaans, R. Gusten, K. Wada, H. W. W. Spoon *Structure and Dynamics of Galaxy Nuclei - Imaging and 3-D Modelling* (12+3)

12.15-12.30 Daniela-Adriana Lacatus, Madalina Badea, Alin Razvan Paraschiv *Peculiar Morphologies of Extended Extragalactic Radio Sources from Numerical Simulations* (12+3)

12.30-12.45 Daria Dobrycheva, O. Melnyk *Color Indices and Morphological Properties of Galaxies in Pairs* (12+3)

12.45-13.00 Igor Zinchenko *The Redshift Evolution of Oxygen and Nitrogen Abundances in Emission-Line SDSS Galaxies* (12+3)

13.00-13.05 Kateryna Agienko *WR-Galaxies in SDSS DR7* (poster)

13.05-13.10 Denis Sokolov, V. Marchenko, E. Sukach *The Structure of Jets in AGN from Radio and X-ray Data* (poster)

13.10-13.15 Anna Saburova *On the Possibility of Massive Discs in Low Surface Brightness Galaxies* (poster)

Section 'Gravitation & Cosmology'

14.00-14.45 Yakiv Pavlenko *Grants and Science in Europe and Ukraine* (invited)

14.45-15.00 Dmytro Iakubovskiy *Hunting for Dark Matter Particles* (12+3)

15.00-15.15 David Sobral *The Clustering and Environment of Star-Forming Galaxies at $z = 0.84$: the HiZELS- $H\alpha$ View* (12+3)

15.15-15.45 Tea-break

15.45-16.00 Grygorii Polinovskyi, G. Ivashchenko *Mean Transmitted Flux in the Ly α Forest from a Sample of 2QZ Quasars* (12+3)

16.00-16.15 Olga Sergijenko, B. Novosyadlyj *Perturbed Recombination and CMB Anisotropy: Linear Effect* (12+3)

16.15-16.30 Olga Nasonova *Blueshifted Galaxies in the Virgo Cluster* (12+3)

16.30-16.45 Szymon Sikora *Static, Spherically Symmetric Gravitational Lens Filled with Perfect Fluid* (12+3)

16.45-17.00 Oleksandr Stefanyshyn *Highly Relativistic Spinning Particle in a Gravitational Field* (12+3)

17.00-17.05 Olga Sergijenko, B. Novosyadlyj, S. Apunevych *Observational Constraints on Minimally Coupled Dark Energy Models: WMAP7 + SDSS DR7* (poster)

- 17.05-17.10 **Iurii Babyk**, O. Melnyk *X-ray Emission in Galaxy Clusters* (**poster**)
- 17.10-17.15 **Ganna Ivashchenko**, V. I. Zhdanov, A. V. Tugay *Correlation Function of Quasars in Real and Redshift Space from SDSS DR7* (**poster**)
- 17.15-17.20 **Sajad Abbar**, S. Rahvar *Observational Constraints on Cosmic Snap Parameters in a Kinematical Approach* (**poster**)
- 18.30-22.00 Organ hall / opera hall / etc.

Thurthday, April, 29

Section 'High-Energy Astrophysics'

- 09.30-09.45 **Ievgen Vovk**, A. Neronov *Evidence for Existence of Extragalactic Magnetic Fields in Excess of 10^{-16} G from Fermi Non-Detection of Distant TeV Blazars* (**12+3**)
- 09.45-10.00 **Margaryta Sobolenko**, D. Iakubovskiy *Observation of X-ray Spectral Hysteresis in the TeV BL Lacs Objects BL Lac and 1ES 1959+650* (**12+3**)
- 10.00-10.15 **Mykola Malygin**, D. Iakubovskiy *Search for Cyclotron Absorptions from Magnetars with XMM-Newton* (**12+3**)
- 10.15-10.30 **Taras Kuzyo**, O. Petruk *Magnetic Field Strength from Nonthermal Images of SN 1006* (**12+3**)
- 10.30-10.35 **Ekaterina Sukach**, V. Marchenko, D. Sokolov *Image and Spectral Analysis of Jets in AGN from X-ray Data* (**poster**)
- 10.35-10.40 **Olga Kosenok**, Marina Prus, Dmytro Doroshenko, V. Marchenko *Image and Spectral Analysis of Jets in AGN from X-ray Data* (**poster**)
- 10.40-11.10 Tea-break

Section 'Astroparticle Physics'

- 11.10-11.25 **Vasyl Beshley**, O. Petruk *Images of Supernova Remnants in Gamma-Rays due to Pion Decays* (**12+3**)
- 11.25-11.40 **Nataliia Kondrashova**, B. I. Hnatyk *Modeling of TeV Gamma-Ray Radiation from Supernova Remnant IC443* (**12+3**)
- 11.40-11.55 **Maria Trylis**, B. I. Hnatyk *Hadronic Model of TeV Gamma-Ray Radiation from Supernova Remnant Vela Jr.* (**12+3**)
- 11.55-12.10 **Volodymyr Masliukh**, B. I. Hnatyk *High-Energy Cosmic Rays from GRB Progenitors - Hypernovae* (**12+3**)
- 12.10-12.25 **Oleh Kobzar**, B. Hnatyk, V. Marchenko, T. Bogdan *Propagation of Different Components of Cosmic Rays in the Galactic Magnetic Fields* (**12+3**)
- 12.25-12.40 **Oleksandr Sushchov**, B. Hnatyk, O. Kobzar, V. Marchenko, T. Bogdan *The Influence of Extragalactic Magnetic Fields on the Propagation of Cosmic Rays* (**12+3**)
- 12.40-12.55 **Demid Pekur**, B. Hnatyk, V. Marchenko *Neutrinos from Relativistic Shock Break-Out at the Surface of Hypernova* (**12+3**)

17th Young Scientists' Conference on Astronomy and Space Physics

12.55-13.00 Tetyana Salivon, D. Iakubovskiy *Modeling of Gamma-Ray Emission for Fermi/LAT Supernova Remnants* (**poster**)

Section 'Interstellar Medium'

14.00-14.45 Alexey Berezhnoy *Chemical Evolution of the Universe* (**invited**)

14.45-15.15 Tea-break

15.15-15.30 Paweł Dobierski *Interstellar Atomic Lines* (**12+3**)

15.30-15.45 Yury Pakhomov, N. N. Chugai, A. F. Iyudin *Stellar Spectroscopy Methods for Study of Supernova Remnants* (**12+3**)

15.45-16.00 Ivan Litovchenko, A. V. Alakoz, I. E. Val'ts *Mapping of Class I Methanol Emission in the Environment of Masers Identified with SNR and Discovery of New Masers* (**12+3**)

16.00-16.15 Volodymyr Marchenko, B. Hnatyk, D. Pekur *Observational Signatures of Relativistic Shock Break-Out at the Surface of Hypernova* (**12+3**)

16.15-16.30 Nikolay Podorvanyuk *Kinematics and Structure of Gas in Star-Formation Regions: Supernovae and Stellar Wind* (**12+3**)

16.30-16.45 Roman Korytko, B. Ya. Melekh, V. V. Golovaty *Redetermination of the Oxygen Abundance in Orion Nebula* (**12+3**)

16.45-16.50 Ruslana Kozel, B. Ya. Melekh, I. O. Koshmak *Multicomponent Photoionization Modelling of Envelopes with Complicated Structure of Stellar Wind Bubble Surrounding Sturburst Region* (**poster**)

16.50-16.55 Davit Sargsyan, T. A. Movsessian *Morphological Study of Cometary Nebulas* (**poster**)

18.30-22.00 Conference dinner

Friday, April, 30

Section 'Solar Physics'

09.30-09.45 Sarah Jabbari, H. Safari *The Slow Mode Oscillations of Solar Coronal Loops* (**12+3**)

09.45-10.00 Anastasiya Boiko, V. N. Mel'nik, A. A. Konovalenko et al. *Frequency Drift Rate of Powerful Decameter Type III Bursts* (**12+3**)

10.00-10.15 Olena Andriets, V. G. Lozitsky *Magnetic Fields Evolution in the Weak Solar Flares* (**12+3**)

10.15-10.20 Olexandra Baran *Structure of the Convective Flows of Real Solar Granulation* (**poster**)

10.20-10.25 Anton Prihodko *Determination of the Chromospheric and Photospheric Matter Motion Velocity during a Solar Flare* (**poster**)

10.25-10.30 Antonina Klyueva, V. G. Lozitsky *Intriguing Zeeman Splitting of FeI 6094.419 Line in a Sunspot: Violation of ls-Coupling or Superstrong Magnetic Fields?* (**poster**)

Programme

10.30-10.35 Olga Botygina, V. G. Lozitsky *Magnetic Field in a Solar Prominence Measured in D3 HeI Line* (**poster**)

10.35-11.05 Tea-break

11.05-11.50 Klim Churyumov *Space Mission “Rosetta” and Its Main Target – Comet 67P* (**invited**)

Section ‘Positional Astronomy and Astronomical Equipment’

11.50-12.05 Lyudmila Berdina, A. A. Minakov *“Generalized” Method of the Phase Screen for Medium Inhomogeneities of Shatjatmaz* (**12+3**)

12.05-12.20 Ksenia Suchomska *First Observations with a New Echelle Spectrograph QSI 532s+* (**12+3**)

12.20-12.35 Anton Pomazan, A. V. Ivantsov, L. A. Gudkova *Automation of Telescope Time Scheduling* (**12+3**)

12.35-12.50 Boris Safonov *Lucky Image Performance Simulation on the Basis of Optical Turbulence Data Obtained on Shatjatmaz* (**12+3**)

12.50-13.05 Vitaliy Zhaborovskyy, V. Ya. Choliy *Kyivgeodynamic++: Software Package for Processing Satellite Laser Ranging Data* (**12+3**)

13.05-13.10 Vitaliy Zhaborovskyy, V. Ya. Choliy *Determination of Reference Frames Deflections from Optical Observations of GNSS Satellites* (**poster**)

13.10-13.15 Ivan Syniavskiy, A. P. Vidmachenko, Yu. S. Ivanov, O. O. Monsar, M. G. Sosonkin *The Equipment for Polarimetric Observations of Astronomical Objects* (**poster**)

13.15-13.20 Mislav Balokovic, D. Vinkovic *Using General Purpose Graphical Processing Units for Applications in Astronomy and Astrophysics* (**poster**)

13.20-13.25 Serhiy Pokhvala, B. Yu. Zhilyaev *Determination of the Sky Background in Kiev with Digital Camera Canon 350D* (**poster**)

13.25-13.30 Anastasiia Zolotukhina *Creation IR Database* (**poster**)

Section ‘Space Geophysics & Physics of the Near Space’

14.30-15.15 Yuri Khotyaintsev *Particle Acceleration during Solar Flares and Magnetospheric Substorms* (**invited**)

15.15-15.30 Grzegorz Wiktorowicz, E. Słomińska, H. Rothkaehl, A. Krankowski *Main Ionospheric Trough – Dynamic Structures of Ionosphere* (**12+3**)

15.30-15.45 Allawi Habeeb, A. Al-Sawad *Observation of the Location of CMEs Associated with ~30–100 MeV SEP Events* (**12+3**)

15.45-16.00 Mariia Soloviova, I. O. Anisimov *Modes’ Concurrence in Transversely Restricted Electron Beam Injected into Homogeneous Plasma* (**12+3**)

16.00-16.15 Daria Velykanets, S. M. Levitsky *Longitudinal Acceleration of Plasma Electrons during the Beam-Plasma Interaction* (**12+3**)

17th Young Scientists' Conference on Astronomy and Space Physics

- 16.15-16.30 Tetiana Skorokhod**, G. Lizunov *Morphology Structure of Atmosphere Gravity Waves According to the in Situ Satellite Measurements (12+3)*
- 16.30-17.00 Łukasz Gruszka**, E. Wnuk, I. Wytrzyaszczak, J. Gołębiewska, A. Rożek *Predictions of Space Debris (12+3)*
- 17.00-17.05 Artur Durajski**, M. Szcześniak, R. Szcześniak, M. W. Jarosik *The Secondary Radiation of the Earth Ionosphere (poster)*
- 17.05-17.10 Polyana Dobрева**, D. K. Koitchev, V. I. Keremidarska, M. D. Kartalev *Numerical Modeling of the Magnetosphere with Data Based Internal Magnetic Field and Arbitrary Magnetopause (poster)*
- 17.10-17.15 Dmytro Salyuk**, O. Agapitov *Nonlinear Anticyclone Structures in the Earth Atmosphere (poster)*
- 17.15-17.20 Andriy Voshchepynec**, O. Agapitov *Dynamic Magnetic Structures near the Quasi-Parallel Earth Bow Shock (poster)*
- 17.20-17.25 Valentyn Bovchaliuk**, V. M. Reshetnyk *Coronal Mass Ejections Dynamics on the Small Heliocentric Distances (poster)*
- 17.25-18.15** Poster Section + Tea-break
- 18.15-18.30** Official closure

Saturday, May, 1

- 10.00-14.00** Excursions to Museum of Folk Architecture and Life of Ukraine / Kyiv-Pechersk Lavra / M. M. Gryshko National Botanic Garden

“Generalized” Method of the Phase Screen for Medium Inhomogeneities of Different Spatial Scale

Lyudmila Berdina, A. A. Minakov

Institute of Radio Astronomy of NAS of Ukraine, Kyiv, Ukraine

lberdina@mail.ru

Radioastronomy and astrophysics often have problems connected to the radiation propagation in media with two spatial scales. This can be local inhomogeneity in the magnetosphere, ionosphere, solar corona or microlenses in the galaxy, pulsars in globular clusters etc. The analysis of radiation focusing, as a rule, is performed within the framework of a method of the phase screen. However, this approach causes considerable difficulty of accounting extensive medium in which there is local heterogeneity. In the present work, a generalization of the phase screen method for the medium with two spatial scales on the basis of Sobolev method was obtained. The results are used to analyze the focusing of radiation in the gravitational field of a star situated inside the gravitational field of a galaxy. In the present work, the solution on the basis of “generalized” method of the phase screen was obtained that allowed difference of focusing scales on separate regions of the path to be taken into account.

First Observations with a New Echelle Spectrograph QSI 532s+

Ksenia Suchomska

Centre for Astronomy of Nicolaus Copernicus University, Toruń, Poland

suchomska@astri.uni.torun.pl

After purchasing the QSI 532s+ Scientific CCD camera for the Observatory in Pinnice, lots of testing images have been taken in order to establish basic parameters. This presentation is about how the new spectrograph performed during testing and if it met the manufacturer specifications. The next step was to find out how the CCD camera performed on the stars.

Automation of Telescope Time Scheduling

Anton Pomazan, A. V. Ivantsov, L. A. Gudkova

Research Institute “Mykolaiv Astronomical Observatory”, Mykolaiv, Ukraine

anton@mao.nikolaev.ua

A software for efficient scheduling of observations of asteroids at a given time moment has been developed to optimize the observational process at the telescope AZT-8 (Evpatoria) operating in automatic mode. The schedule of observations is calculated with the specific conditions of visibility of objects for the given telescope. The next conditions which correspond to astrometric observations of asteroids have been chosen to constrain scheduling at the given time moment: 1) observations of objects should be made as close as possible to the meridian; 2) observations should be made for the maximum number of objects. The software uses technical characteristics of the telescope and camera, ephemerides, calculated with the HORIZONS system, and a given SNR for each object for scheduling of observations. The theoretical extinction value, phase and position of the Moon relatively to the observational objects and horizon are also used for the calculation of exposure time. The algorithm schedules observations of photometric calibration fields. The result of algorithm depends on

a ratio number of the objects planned for observation to the maximum number of objects which can be observed at night, i.e. the algorithm will provide changes to the list of objects in dependence of the previous run (it is necessary to avoid a situation, when the algorithm systematically skips a certain class of objects all the time).

Lucky Image Performance Simulation on the Basis of Optical Turbulence Data Obtained on Shatjatmaz

Boris Safonov

Sternberg Astronomical Institute, Moscow, Russia

safonov@sai.msu.ru

Lucky imaging is a method allowing to achieve diffractive resolution on a moderate ground-based telescopes at the cost of limiting magnitude. To adequately evaluate capabilities of this technique for a given place (Mt. Shatjatmaz) we performed a numerical simulation taking into account properties of optical turbulence measured on the site. For this purpose we have developed a Monte Carlo simulation code based on principles described in Lane et al, 1992; Baldwin et al, 2008. Turbulence data obtained with MASS/DIMM device on the site in 2007-2009 years was used as a basis for this simulation. Statistics of lucky imaging main characteristics – isoplanatic angle and optimal exposure was evaluated on the basis of this data. Optimal conditions for lucky imaging was derived. The necessity of dynamic planning of observation was shown.

Kyivgeodynamic++: Software Package for Processing Satellite Laser Ranging Data

Vitaliy Zhaborovskyy, V. Ya. Choliy

National Taras Shevchenko University of Kyiv, Kyiv, Ukraine

zhskyy@gmail.com

Modernized software package KG++ is presented. It is subjected to be used for processing SLR data with the purpose to derive Earth's rotation parameters, station coordinates, time and others model parameters. We present package history, methods and results of refactoring, first scientific result and discussion.

Determination of Reference Frames Deflections from Optical Observations of GNSS Satellites

Vitaliy Zhaborovskyy, V. Ya. Choliy

National Taras Shevchenko University of Kyiv, Kyiv, Ukraine

zhskyy@gmail.com

In summer seasons of 2007–2010 five sets of optical observations of GNSS satellites were taken at Terskol observatory. GPS and GLONASS satellites were photographed among stars during their crossing of celestial equator. Optical coordinates were determined and used as reference values for intercomparison of dynamical reference frame of GPS satellites against the dynamical reference frame of GLONASS satellites. Possible differences of two dynamical reference frames may cause additional errors during joint processing of GNSS satellites observations and should be taken into account.