BOOK OF ABSTRACTS

Title : On the relation between GRB classes and X-ray Flashes

Author : Zsolt Bagoly

Abstract : Gamma-ray bursts are usually classified into either short-duration or long-duration bursts. Going beyond the short-long classification scheme, it has been shown on statistical grounds that a third, intermediate population is needed in this classification scheme. We are looking for physical properties which discriminate the intermediate duration bursts from the other two classes. As the intermediate group is the softest, we argue that we have related them with X-ray flashes among the GRBs. We give a new, probabilistic definition for this class of events.

Title : Angular Distribution of GRBs

Author : Lajos G. Balázs

Coauthors : A. Mészáros, I. Horváth, Z. Bagoly and P. Veres

Abstract : We studied the complete randomness of the angular distribution of gamma-ray bursts (GRBs) detected by BATSE. Since GRBs seem to be a mixture of objects of different physical nature we divided the BATSE sample into 5 subsamples (short1, short2, intermediate, long1, long2) based on their durations and peak fluxes and studied the angular distributions separately. We used three methods, Voronoi tesselation, minimal spanning tree and multifractal spectra to search for non-randomness in the subsamples. To investigate the eventual non-randomness in the subsamples we defined 13 test-variables (9 from the Voronoi tesselation, 3 from the minimal spanning tree and one from the multifractal spectrum). Assuming that the point patterns obtained from the BATSE subsamples are fully random we made Monte Carlo simulations taking into account the BATSE's sky-exposure function. The MC simulations enabled us to test the null hypothesis i.e. that the angular distributions are fully random.
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Abstract : *(Continue from the previous page ...)*
We concluded that the short1, short2 groups deviate significantly (99.90%, 99.98%) but it is not the case at the long samples. At the intermediate group the tests also give significant deviation (98.51%). A statistical study of the angular distribution of GRBs detected by the Swift satellite resulted only a weak level of significance in the case of bursts of intermediate duration.

Title : Results of selected Cataclysmic Variables from INTEGRAL/IBIS data

Author : Martin Blažek

Coauthors : Rene Hudec

Abstract : We present multiwavelength analysis of several Cataclysmic Variables observed by INTEGRAL and D50 robotic telescope.

Title : Cataclysmic Variables - X-rays and Optical Activity

Author : Rudolf Gális

Coauthors : L. Hric, E. Kundra

Abstract : Intermediate polars represent a major fraction of all cataclysmic variables detected by INTEGRAL in hard X-ray. These object have been recently proposed to be the dominant X-ray source population detected near the Galactic centre and they also contribute significantly to the X-ray diffuse Galactic ridge emission. Nevertheless, only 25 % of all known intermediate polars was detected in hard X-ray so far. This fact can be related with activity state of these close interacting binaries. Multi-frequency (from optical to X-ray) investigation of intermediate polars is essential to understand physical mechanisms responsible for observed activity of these objects.

Title : The intriguing nature of the cataclysmic variable SS Cygni

Author : Franco Giovannelli

Title : Cygnus X-1: shedding light on the spectral variability of black holes

Author : Victoria Grinberg

Abstract : We present an analysis of extensive recent monitoring observations of the high mass black hole X-ray binary Cygnus X-1 obtained as part of the 2007 to 2011 Key Programme observations of the INTEGRAL mission. Cyg X-1 is one of only three persistent black hole binaries in our galaxy that spend most of their time in the hard spectral state. After spending 3 years in the hardest regime of its parameter space, the source displayed a softening and flaring episode in mid 2009 and entered an on-going soft state in early 2010 June. While the hard X-ray spectrum of Cyg X-1 is one of the best studied examples of its kind, e.g. through our years long monitoring campaign with RXTE, the INTEGRAL monitoring allows us to study the spectral evolution from about half an hour over a few days to a few weeks, timescales that have been only sparsely sampled so far.
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Abstract : *(Continue from the previous page ...)*
The parameter ranges for hard and soft state are constrained and discussed with a special focus on the comparison with previous observations of both Cyg X-1 itself and transient sources, where such measurements, which are important in order to understand the physics of the hot plasma of the jet base and/or the corona, are typically difficult to obtain with high accuracy. Furthermore we touch upon possible polarization measurements of Cyg X-1 with INTEGRAL/IBIS.

Title : Structural variability of 3C 111 on parsec scales

Author : Christoph Grossberger

Coauthors : Kadler, M., Wilms, J., Müller, C., Beuchert, T., Ros, E., Ojha, R., Angelakis, E., Fuhrmann, L.

Abstract : We discuss the parsec scale structural variability of the extragalactic jet 3C 111 related to a major flux density outburst in 2007. The data analyzed were taken within the scope of the MOJAVE program, which monitors a large sample of the radio brightest compact extragalactic jets with the VLBA. We compare our results with the structural variability observed during the aftermath of the last major outburst of 3C111 in 1996 (Kadler et al. 2008). The analysis is performed both by fitting Gaussian model components in the visibility domain data and by applying a hierarchical cross correlation algorithm in the image domain.

Title : BOOTES-4. Installation in Russia.

Author : Sergiy Guziy

Coauthors : A.Pozanenko, A.Chernenko, P.Papushev, E.Klunko, I.Korobcev, J.Gorosabel, M.Jelínek, P.Kubanek, R.Cunniffe, R.Sanchez-Ramirez, J.C Tello, A.J.Castro-Tirado

Abstract : The new BOOTES-4 telescope will be installed in Russia (Siberia, Mondy) as part of a world wide network of robotic telescopes. We present information about current situation of the installation. Location, weather and some technical details.

Title : Metal enrichment of the Intar-cluster medium

Author : Markus Haider

Coauthors : Dominik Steinhauser

Abstract : We present cosmological hydrodynamical simulations of galaxy clusters aimed at studying the dynamical and chemical evolution of the intra-cluster medium (ICM). Our setup uses an N-body code to simulate the dark matter distribution from which we generate a background potential. Galaxy properties are calculated using a semi-analytical galaxy formation model and the evolution of the intra-cluster medium is modelled via a grid-based hydrodynamics code. To study metal enrichment, we model two transport mechanisms from the galaxies into the ICM, galactic winds and ram-pressure stripping. This setup allows us to investigate the metal enrichment history of the ICM, the importance of the transport mechanisms and to trace the distribution of single elements in the ICM.

Title : Astrophysics with Low Dispersion Spectra, ESA Gaia, and Inheritance of NASA Astronaut Karl Henize

Author : Rene Hudec

Coauthors : L. Hudec

Abstract : The ESA satellite Gaia to be launched in 2012 will deliver mostly astrometric data but there will be also photometric data from BP/RP photometers. These will represent ultra-low dispersion spectra analogous to those obtained in the past by low dispersion objective prisma sky surves with photographic plates. We will refer on the NASA Astronaut Henize H-alpha southern survey plate collection and will show that this database is important for ESA Gaia as it confirms the existence of extremely strong emissions accessible by Gaia BP/RP.

Title : Czech Participation in INTEGRAL

Author : Rene Hudec

Abstract : The status of Czech participation in the ESA INTEGRAL project will be presented and discussed, together with brief history and history of IBWS workshops.

Title : Czech Participation in IXO: Recent Status

Author : Rene Hudec

Abstract : The status of Czech participation in the ESA IXO (International X-Ray Observatory) project will be presented and discussed, with emphasis on design and development of novel technologies and arrangements for astronomical X-ray optics.

Title : Introduction of the All-Sky Camera Project

Author : Michal Jakubec

Coauthors : Miroslav Křížek, Miroslav Spurný, Petr Skala

Abstract : Presentation of initial concepts, general architecture and achieved results of affordable, multi-purpose solution for all-sky astronomical imaging. Overall hardware and software design, strategy of further evolution, improvement of technical parameters and possible applications will also be discussed.

Title : BOOTES-2 and COLORES spectrograph

Author : Martin Jelinek

Coauthors : Ovidio Rabaza and Ronan Cunniffe

Abstract : COLORES is a low resolution faint object spectrograph and camera (FOSC) designed for rapid response, spectroscopic followup of Gamma Ray Bursts. The project is in an advanced stage of develpoment with deployment planned for summer 2011. We plan to present the current state of the project, the target telescope and the primary scientific case - ie. GRB follow-up.

Title : GRB080413A - a bright GRB afterglow detected by BOOTES-1B

Author : Martin Jelinek

Abstract : We present results of our early follow-up of the bright optical afterglow of the GRB 080413A with the 30 cm telescope BOOTES-1B, together with the later photometry and spectroscopy by larger telescopes.

Title : Intermediate polars masses from INTEGRAL and XMM

Author : Matus Kocka

Coauthors : Hroch, F.

Abstract : We present the simple and advance model of the post shock region (PSR) in intermediate polars. Using comparation of these models with observed spectras from INTEGRAL/IBIS (17-80keV) and XMM-Newton(1-10keV) we can estimate the temperature of PSR and then the mass of white dwarf (WD). The mass of WD is the fundamental parameter.

Title : JULO and SKcube, near space and space missions

Author : Matus Kocka

Coauthors : Erdziak J., Chrenko B., Kapus J., Krovina A., Krpalek L., Kutka A., Slosiar R., Zatko M.

Abstract : We present a simple and cheap methods for near-space research using small balloons platform called JULO. This platform is designet to provide telemetry, weather and space-weather monitoring like: GPS possition, atmospheric presure, temperature and density of cosmic particles. Platform will also provides slots for small, so called, ballon-sats, which can be students projects for near-space research. The main goal of this work is to provide a simple way to get space research know-how to students. The aim of this work is to reach know-how and create comunity for build first Slovak cube-sat. We want also present the next step in development of our cheap near-space and space probes which will be cube-sat experiment so called skcube.

Title : SID - Cloud

Author : Matus Kocka

Coauthors : Slosiar, Marko, Zatko, Hudec

Abstract : SID-monitor is a powerful tool to detect solar flares and such events like GRBs. In this talk we present method how to use network and jabber protocol to create a SID monitor network so called SID Cloud

Title : Dips and Offstates in High mass X-ray binaries

Author : Ingo Kreykenbohm

Coauthors : Gogus, E., Fuerst, F., Belloni, T., Wilms, J., Suchy, S., Rothschild, R.E.

Abstract : We present a detailed study of the absorption and dipping behavior of the accreting High Mass X-ray Binary GX 301-2. We use data from the XMM-Newton observatory to study the low energy continuum and the iron line complex and data from the Rossi X-ray Timing Explorer (RXTE) to model the continuum and study lightcurves. The analysis of the RXTE data shows that the source is strongly variable: the source exhibits intense flaring as well as dipping activity. The source countrate as recorded by the RXTE-PCA drops to almost zero during some of the dips in the lightcurve. A similar dipping behavior has been observed in the Vela X-1 (Kreykenbohm et al. 2008) as well as a number of other massive wind accreting sources. We present a detailed spectral and temporal study of the dips and discuss possible scenarios to explain the dips. The high quality XMM timing mode data are taken during the pre-periastron flare. We accumulate spectra with an exposure time of 30 seconds.
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Abstract : *(Continue from the previous page ...)*
Keeping the continuum parameters fixed, we obtain the column density NH and the iron line parameters for each of these short spectra. We can therefore track the evolution of the NH and the iron line and thus the absorbing material with very high time resolution, showing that the density of the absorbing material varies strongly on timescales of 100 seconds or less.

Title : RTS2 - an open source observatory control system, ready for the prime time?

Author : Petr Kubanek

Abstract : I would like to report on current progress of the Remote Telescope System, 2nd version (RTS2) development - its current installations on mid aperture telescopes, integration of the human-in-the-loop scheduling which provides human observer graphical user interface to enter targets into meta-queues, and various other issues. System advanced scripting capabilities will be explained, new XML based constraint specification covered, as well as ideas for upcoming advanced autonomous scheduling capabilities.

Title : GRO J1008-57: high precision timing and spectral evolution

Author : Matthias Kühnel

Coauthors : Müller, S. Kreykenbohm, I. Wilms, J. Pottschmidt, K. Fuerst, F. Suchy, S. Rothschild, R. Caballero, I. Kretschmar, P. Schoenherr, G. Klochkov, D. Santangelo, A. Staubert, R.

Abstract : The transient high mass X-ray binary GRO J1008-57 underwent an outburst in December 2007, which was recorded by RXTE, Suzaku and Swift. With 180 mCrab this outburst was the most luminous since the start of the RXTE ASM monitoring in 1996. The system is only visible in X-rays during outbursts, which repeat mostly on the 249 day orbital period of the system. Due to the relatively short outburst durations of around 15 days, the orbital coverage is quite low. Hence determining the orbit is challenging. By analysing pulse arrival times of the 2007 lightcurves together with data from an outburst in 2005 recorded by RXTE, we were able to improve the existing orbital parameters.
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Abstract : *(Continue from the previous page ...)*
Since the discovery of GRO J1008-57 in 1993 a cyclotron absorption feature at 88 keV is claimed, which could not be securely confirmed yet. Focusing on the spectral evolution we also found evidence for this possible cyclotron line. Additionally we discovered an absorption like feature at around 22 keV, which is, however, only seen at high luminosities. RXTE will observe the outburst of GRO J1008-57 in April 2011 to clarify its existence.

Title : Search for Radio and Gamma-ray correlations of Giant pulses from the Crab pulsar

Author : Natalia Lewandowska

Abstract : Its pulsed emission visible at radio, optical, X-ray and gamma wavelengths make the Crab pulsar a unique source of pulsar emission. Apart from its regular pulses, it is also a source of short-term radio outbursts known as giant pulses. These pulses exhibit flux densities by a factor of at least 1000 higher in contrast with regular pulses and occur apparently non-regularly. In spite of various investigations in the past their origin and emission mechanisms are still enigmatic. Within the framework of this talk the current study of giant pulses at radio and gamma wavelengths observed with the Westerbork Synthesis Radio Telescope (WSRT) and the MAGIC Telescopes is presented with the aim of a correlation analysis between giant radio pulses and high energy photons.

Title : A crazy question: Can be the apparently brighter gamma-ray bursts at larger distances?

Author : Attila Meszaros

Coauthors : Jakub Ripa, Felix Ryde

Abstract : The natural assumption is that fainter objects should, on average, lie at larger redshifts. Redshifts larger than 5 are rare for bursts with measured redshifts. On the other hand, faint bursts with non-detected redshifts are in majority. Hence, it seems that the majority of bursts should be at redshifts larger than 5. It is shown that this need not be the case, because the apparently fainter bursts need not, in general, lie at large redshifts. The presentation is a recapitulation of the article arXiv:1101.5040

Title : XTE J1946+274: The resurrection of a sleeping X-ray pulsar

Author : Sebastian Müller

Coauthors : Kühnel, M., Kreykenbohm, I., Wilms, J., Caballero, I., Ferrigno, C., Pottschmidt, K., Santangelo, A., Staubert, R., et al.

Abstract : We report on a series of outbursts of the transient X-ray pulsar XTE J1946+274 in the second half of 2010 after nearly one decade of quiescence. Quasi-simultaneous Swift-, RXTE-, and INTEGRAL observations allow us to study the pulse period ephemeris of the neutron star as well as the spectral parameters. We confirm the presence of a cyclotron line at about 35 keV. Using pulse arrival time analysis we determined the pulse period ephemeris of the neutron star which allows us to do pulse phase resolved spectroscopy.

Title : S5 1803+784 revisited

Author : Roberto Nesci

Coauthors : Alessandro Maselli, Franco Montagni, Silvia Sclavi

Abstract : We present the optical light curve of the BL Lac object S5 1803+78 from 1996 to 2010 and compare its behaviour with the X-ray and Gamma-ray data.

Title : Analysis and simulation of Pi of the Sky detector response

Author : Lech Piotrowski

Abstract : The "Pi of the Sky" project is aimed at observation of optical flashes of astronomical origin and other light sources variable on short timescales, down to tens of seconds. We search mainly for optical emissions of Gamma Ray Bursts, but also variable stars, novae, blazars, etc. This task requires a precise photometry - accurate measurement of the source's brightness (and it's variability). "Pi of the Sky" single cameras' field of view is about $20° \times 20°$. This causes a significant deformation of a point spread function (PSF), reducing quality of brightness and position measurement with standard photometric and astrometric algorithms. Improvement requires a careful study and modeling of the PSF. A dedicated laboratory setup has been created for obtaining isolated, high quality profiles, which in turn were used as the input for mathematical model. Results of it's application to brightness and position measurements, a search for precursor of the naked–eye burst GRB080319B and the "Pi of the Sky" frame simulator will be presented.

Title : Gamma ray bursts with known redshift - parameters and their correlations

Author : Jana Polednikova

Abstract : Light curves of the GRBs observed by Swift BAT can be divided into several groups according the features they exhibit. Those groups of GRBs are then studied using known parameters and the correlation of those within the groups.

Title : Multi-functional star tracker - future perspectives

Author : Jan Rohac

Coauthors : Hudec Rene, Rerabek Martin

Abstract : The paper is focused on a multi-functional wide-field star tracker (WFST) and the description of its present state-of-the-art and perspectives for the future. Proposed WFST will combine functions of several instruments together, such those as star-tracker and all-sky photometry camera. WFST will use fish-eye lens with up to 180 deg. field of view (FoV). In the present technology there is not any similar product available on market. Nowadays, instruments for all-sky photometry, stars, and planet observation, of course, already exist. Furthermore, star trackers exist as well. Nevertheless, star trackers usually have more than one object-lens with small FoV, and are not usually used for photometry. Therefore, a spacecraft has to carry more instruments for mentioned applications, which increases weight and thus decreases weight designated for a payload. Our proposed device should combine those instruments and their functions, so it will be lighter and variable for its applications during various space missions.

Title : GLORIA

Author : Francisco Manuel Sánchez-Moreno

Abstract : GLORIA is an innovative citizen-science network of robotic telescopes, which will give free access and research to a virtual community via the Internet. The GLORIA partners will offer access to a growing collection of robotic telescopes via a Web 2.0 environment - 17 telescopes on 4 continents by the project's end. The GLORIA partners can do this because most of the telescopes are already robotized using the same free/open-source RTS2 software (maintained by GLORIA members), and the web access will be based on Ciclope Astro (also by a GLORIA member), which currently provides the world's first free-access robotic telescope at Montegancedo Observatory (http://om.fi.upm.es). The Internet experiments will be coordinated by Galaxy Zoo (http://galaxyzoo.org). The challenge will be to involve people from around the world, to maximise their collective intelligence, and to foster their participation in astronomy research both in data analysis and actual observations.
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Abstract : *(Continue from the previous page ...)*
The e-Infrastructure will be managed using the method of 'karma', proven in most successful web 2.0 sites, whereby those users who participate the most are awarded corresponding observing time. GLORIA will be an e-Science network for the virtual community, demonstrating how networking and open e-Infrastructures can increase the quality of research. During the project, 17 telescopes and 2 experiments will be deployed for these citizen scientists, and a foundation will be built up of documentation, free software, and a community of people will have grown, to maintain and grow GLORIA into the future. Significant dissemination efforts will be made to draw in ordinary people, as well as scholars, to use the network, to learn about astronomy, and to do real science. Currently, GLORIA's telescopes are individually supported from national funds and as this should continue, the network will not bear the cost of their maintenance. GLORIA can easily survive in the future with minimal national funding or even donations.

Title : MAGIC Gamma Ray Observations

Author : Aimo Sillanpää

Abstract : MAGIC is a system of two 17m Cherenkov telescopes, sensitive to very high energy (VHE) gamma-rays between 50 GeV up to several tens of TeV. MAGIC observations of Active Galactic Nuclei (AGN) are briefly discussed.

Title : Photometric analysis of the Pi of the Sky data

Author : Malgorzata Siudek

Abstract : Database containing star's measurements from period 2006-2009 taken by the Pi of the Sky detector located in Las Campanas Observatory in Chile contains more than 2 billions measurements of almost 17 millions of objects. All measurements are available on the Pi of the Sky web site through a dedicated interface which also allows to download the selected data. Accurate analysis of Pi of the Sky data is a real challenge because of a number of factors that can influence measurements. Reading the chip with the shutter opened, strong and varying sky background, passing planets or planetoids, clouds and hot pixels are among possible sources of errors in our measurements. In order to facilitate analysis of variable stars we have developed a system of dedicated filters to remove bad measurements or frames. The spectral sensitivity of the detector is taken into account by appropriate corrections based on the spectral type of reference stars. This process is illustrated by the analysis of the BG Ind system where we have been able to reduce the systematic uncertainty to about 0.013 magnitudo.

Title : Pi of the Sky telescopes in Spain and Chile

Author : Malgorzata Siudek

Abstract : Pi of the Sky is a system of robotic telescopes designed for observations of short timescale astrophysical phenomena, like prompt optical GRB emission. The apparatus is designed to monitor a large fraction of the sky with 12m-13m range and time resolution of the order of 1 – 10 seconds. In October 2010 the first unit of the new "Pi of the Sky" detector system was successfully installed in the INTA El Arenosillo Test Centre in Spain. We have also moved our prototype detector from Las Campanas Observatory to San Pedro de Atacama Observatory in March 2011. Status and performance of both detectors is presented and access possibilities for members of astronomical community will be discussed.

Title : N-body/hydrodynamic simulations of galaxies in a cluster environment

Author : Dominik Steinhauser

Coauthors : Markus Haider

Abstract : We study the influence of stellar bulges on the star formation and morphology of disk galaxies which experience ram pressure. Several Tree-SPH simulations have been performed to study the dependence of the star-formation rate on the mass and size of a stellar bulge. In addition different strengths of ram pressure and different alignments of the disk with respect to the intra-cluster medium (ICM) are applied. The simulations are carried out with the combined N-body/hydrodynamic code GADGET-2 with radiative cooling and a recipe for star formation. To simulate the ram pressure acting on the model galaxies, a special wind tunnel setup was developed. The same galaxy with different bulge sizes was used to accomplish 30 simulations with varying inclination angles and surrounding gas densities. Additionally, for comparison reasons, the galaxies are also evolved in isolation.

Title : Robotic telescopes BART & D50

Author : Jan Strobl

Title : Glass thermal formation - experiment vs. simulation

Author : Libor Švéda

Title : Preliminary imaging tests of lobster eye optics for nano-satellite

Author : Vladimír Tichý

Title : Multiwavelength campaign of OJ287 in 2005-2010

Author : Mauri Valtonen

Coauthors : M.Valtonen, H.Lehto, A. Sillanpää, K.Nilsson, L.Takalo, S.Mikkola, C.Villforth

Abstract : OJ287 is the best candidate for a binary black hole system because of its 12 cycle of optical outbursts, observed since 1891. A detailed model for the binary was presented in 1995, and one of the aims of the multi-wavelength campaign in 2005-2010 was to test the model. We describe how the model predicted the timing of optical outbursts, explain the over 90 degree rotation of the radio jet, and the nature of the optical – UV spectrum during the outbursts. We also explain how the model can be used to test the 'no-hair' theorem of black holes in 2019, the key test for the correctness of General Relativity which cannot be performed by any other means at the present time. The work has been carried out in collaboration with Rene Hudec and Jana Polednikova at Czech Republic and with about 90 astronomers from many countries.

Title : Utilization of image intensifiers in astronomy - features, measurements and experiences

Author : Stanislav Vitek

Abstract : MAIA (Meteor Automatic Imager and Analyzer) is a new twin station system for detection of meteor using image intensifier and fast video camera. In our contribution we present experiences with system and first results compared with the old system which used a VHS camera.

Title : Stellar object detection using the wavelet transform

Author : Anisimova Elena

Abstract : Nowadays there are several algorithms for stellar object detection in astronomical images that are used for example in the program package DAOPHOT and Software for source extraction SExtractor. In my bachelor thesis I became acquainted with the wavelet transform and its good localization properties. After studying the manual to DAOPHOT, SExtractor and become familiar with the A trous algorithm used to calculate the wavelet transform I put the task to implement within my thesis an algorithm for stars detection on the base of the wavelet transform. Especially, I focused on the detection of stellar objects in complex fields such as star clusters and galaxies. In this poster I will describe stellar object detection algorithm by the help of wavelet transform and I will show the achived results.

Title : GRB duration distribution considering the position of the Fermi

Author : Zsolt Bagoly

Coauthors : Dorottya Szecsi, Zsolt Bagoly, Istvan Horvath, Lajos G. Balazs, Peter Veres, Attila Meszaros

Abstract : NASA's Fermi Gamma-ray Space Telescope is designed to measure the position of a burst in seconds and change the detectors' orientation.We made a model that involves real motion and orientation of the satellite during its flight and the position and contribution of the main gamma-ray sources to the background.

Title : MC-simulation of a galaxy cluster object list

Author : Johannes Hölzl

Coauthors : Jörn Wilms, Ingo Keykenbohm, Christian Schmid, Christoph Großberger, Michael Wille, Wiebke Eikmann

Abstract : The eROSITA instrument on board of the spacecraft Spectrum-Roentgen-Gamma, which will be launched in 2012, will conduct an all-sky survey in X-Rays. A main goal of the survey is the observation of galaxy clusters, which promises further knowledge of dark matter. As input for the simulation of the survey we present a Monte-Carlo simulation generating a list of galaxy clusters. The clusters are distributed according to the mass function by Tinker et al, 2008. The MC-simulation generates the celestial coordinates as well as cluster mass and redshift, from these the observables luminosity and angular diameter are derived.

Title : Algorithms for Astronomical Plates Evaluation

Author : Lukas Hudec

Coauthors : R. Hudec

Abstract : We refer on algorithms for evaluation of digitized astronomical plates.

Title : Detections of Gamma Ray Bursts by Ionospheric Response

Author : Matus Kocka

Coauthors : Slosiar, Marko, Zatko, Hudec, Ripa

Abstract : We report on the independent and indirect detection of GRBs by their ionospheric response (SID – Sudden Ionospheric Disturbance) observed at VLF (Very Low Frequency). Although few such detections have been already reported in the past, the capability of such alternative and indirect investigations of GRBs still remains to be investigated in more details. We present and discuss the examples of further such VLF/SID detections.

Title : Near-space and possible future space experiments in Slovakia

Author : Matus Kocka

Coauthors : Erdziak J., Chrenko B., Kapus J., Krovina A., Krpalek L., Kutka A, Slosiar R., Zatko M.

Abstract : We present a simple and cheap methods for near-space research using small balloons platform called JULO. This platform is designet to provide telemetry, weather and space-weather monitoring like: GPS possition, atmospheric presure, temperature and density of cosmic particles. Platform will also provides slots for small, so called, ballon-sats, which can be students projects for near-space research. The main goal of this work is to provide a simple way to get space research know-how to students. The aim of this work is to reach know-how and create comunity for build first Slovak cube-sat.

Title : Optical Transients Search in the Bamberg Plate Archive

Author : Fabian Kopel

Coauthors : Rene Hudec, Pedro Krapp

Abstract : A substantial fraction of gamma-ray bursts is related to objects emitting temporarily optical light, i.e. optical afterglows and optical transients. So far, these phenomena (optical transients) were detected only after related gamma-ray satellite detection. However, taking into account their optical magnitudes at maximum light, these objects should be detectable in various historical and recent optical surveys, including photographic sky patrol. Here we report on an extended study based on blink-comparison of 5004 Bamberg Observatory Southern Sky Patrol Plates performed within a high-school student project (Jugend Forscht).

Title : Monitoring PSR B1509-58 with RXTE: Spectral analysis 1996-2010

Author : Eugenia Litzinger

Coauthors : Pottschmidt K., Suchy S., Wilms J., Haney S., Rothschild R.E., Kreykenbohm I.

Abstract : We present an analysis of the X-ray spectra of the young, Crab-like pulsar PSR B1509-58 (pulse period P 151ms) observed by RXTE during 14 years since the beginning of the mission in 1996. The uniform dataset is especially well suited for studying the stability of the spectral parameters over time as well as for determining pulse phase resolved spectral parameters with high significance. The phase averaged spectra as well as the phase resolved spectra can be well described by an absorbed power law.

Title : A new fast Silicon photomultiplier Photometer

Author : Roberto Nesci

Coauthors : F. Meddi, F. Ambrosino, C. Rossi, R. Nesci, S. Sclavi, A. Ruggieri, S. Sestito, I. Bruni, R. Gualandi

Abstract : We have built a prototype of fast astronomical photometer, based on SiPM detectors, commercially available from the Hamamatsu firm. Our system is composed by three MPPC modules, with an active area of 1 mm2. One detector is used to observe the target, one for the sky level and one for a reference star. The light from the telescope reachs each detector through a plastic optical fiber (600 micron diameter). To reduce the electronic noise the detectors are kept inside a commercial freezer at about -8 °C. The acquisition rate is 0.55 ms with an electronic chain developed at La Sapienza University. We observed the Crab Pulsar at the 152 cm Loiano Telescope, reconstructing the pulse shape at a S/N=23 with an integration time of 3300s.

Title : RXTE monitoring of GRS1758-258

Author : Maria Obst

Coauthors : POTTSCHMIDT, Katja (CRESST/UMBC/GSFC), LOHFINK, Anne (UMD), WILMS, Joern (Remeis/ECAP), SMITH, David M. (SCIPP, UCSC), TOMSICK, John A. (SSL, UCB), KREYKENBOHM, Ingo (Remeis/ECAP)

Abstract : GRS 1758-258 is the least well studied of the three persistent black hole X-ray binaries in our Galaxy. It is also one of only two known black hole candidates, including all black hole transients, which shows a decrease of its 3-10keV flux when entering the thermally dominated soft state, rather than an increase. We present the spectral evolution of GRS 1758-258 from RXTE-PCA observations spanning a time of about 10 years from 1997 to 2007. The results of this analysis are compared to that of the INTEGRAL monitoring of the source. We will also compare the long term behaviour of the source to that of the bright persistent black hole X-ray binary Cygnus X-1 and discuss the observed state transitions in the light of physical scenarios for black hole transitions.

Title : N-body/hydrodynamic simulations of galaxies in a cluster environment

Author : Dominik Steinhauser

Coauthors : Markus Haider

Abstract : We study the influence of stellar bulges on the star formation and morphology of disk galaxies which experience ram pressure. Several Tree-SPH simulations have been performed to study the dependence of the star-formation rate on the mass and size of a stellar bulge. In addition different strengths of ram pressure and different alignments of the disk with respect to the intra-cluster medium (ICM) are applied. The simulations are carried out with the combined N-body/hydrodynamic code GADGET-2 with radiative cooling and a recipe for star formation. To simulate the ram pressure acting on the model galaxies, a special wind tunnel setup was developed. The same galaxy with different bulge sizes was used to accomplish 30 simulations with varying inclination angles and surrounding gas densities. Additionally, for comparison reasons, the galaxies are also evolved in isolation.

I. Session on robotic telescopes

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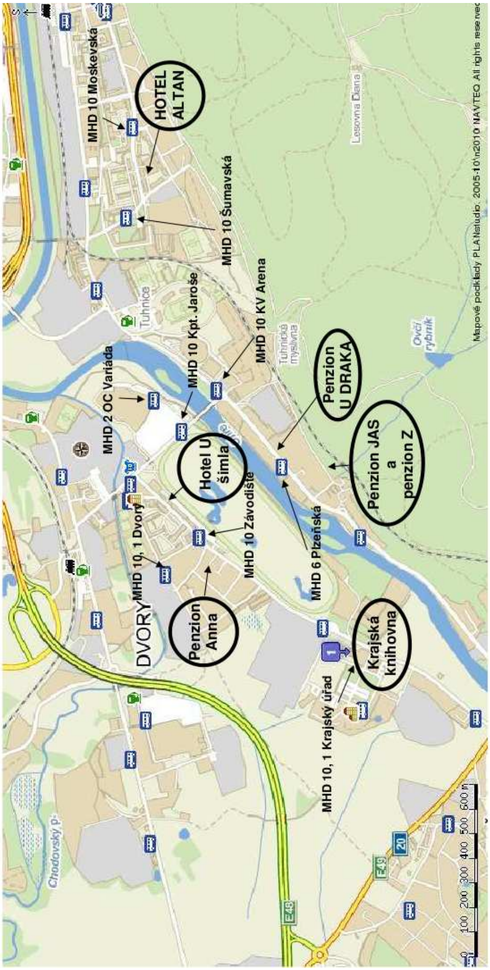
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