



UNIVERSITY OF CRETE
DEPARTMENT OF PHYSICS
SECTION OF ASTROPHYSICS & SPACE PHYSICS
ANNUAL REPORT FOR 2016

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Image Credit of Cover Page

Top: View of the Skinakas summit with the telescope domes and the housing quarters (see Sect. 3.1).

Middle: the receiving antennae of the SESCAT experiment near Chania (see Sect. 3.2).

Bottom: the 1.3m telescope of Skinakas Observatory inside its dome (see Sect. 3.1).

1. INTRODUCTION

The present document summarizes the activities of the members of the Section of Astrophysics and Space Physics at the Department of Physics of the University of Crete, during the 2016 calendar year. The staff of the Section consisted of 16 PhD research scientists, 12 PhD students and 4 technicians. Members of the Section were involved in teaching undergraduate and graduate courses at the University of Crete, while doing research in the fields of Theoretical and Observational Astrophysics, as well as in Atmospheric and Ionospheric Physics. Their research has been funded by national and international research grants, and in 2016 it resulted in 56 papers published in refereed journals, that is 3.5 papers per PhD researcher. Significant efforts were also devoted in the operation and improvement of the infrastructure and hardware at Skinakas Observatory and the Ionospheric Physics Laboratory. This document was prepared in January 2017, based on contributions from all members of the Section. The final editing was done by K. Tassis.

2. Personnel

2.1. PERSONNEL OF THE SECTION

The staff associated with the Section of Astrophysics and Space Physics consists of 16 PhD research scientists, 12 PhD students, and 4 technicians.

The 9 Physics faculty members of the Section during the period of the report were Vassilis Charmandaris (Prof.), Christos Haldoupis (Prof. - retired), Nikolaos D. Kylafis (Emeritus Prof.), John Papamastorakis (Emeritus Prof.), Iossif E. Papadakis (Prof.), Vasiliki Pavlidou (Assist. Prof.), Kostas Tassis (Assist. Prof.), Ilias M. Vardavas (Assoc. Prof. - retired) and Andreas Zezas (Assoc. Prof.). Pablo Reig (Principal Researcher at the Foundation for Research and Technology – Hellas) is also affiliated with the Section. Researchers in non-tenure track positions holding a PhD degree were Dr. Jeff Andrews, Dr. Dmitry Blinov, Dr. Ioanna Leonidaki, Dr. Paul Sell, and Dr. Steven Williams. Support staff associated with the Skinakas Observatory were Mr. Anastasios Kougentakis, Dr. Eythymios V. Paleologou, Mr. George Paterakis, and Ms. Anna Stiakaki.

PhD students during this period were Konstantina Anastasopoulou (with A. Zezas), Tassos Epitropakis (with I. Papadakis), Ioannis Komis (with K. Tassis), Konstantinos Kouroumpatzakis (with A. Zezas), Maria Kopsacheili (with A. Zezas), Konstantinos Kovelakas (with A. Zezas), Ioannis Liodakis (with V. Pavlidou), Alexandros Maragkoudakis (with A. Zezas), Alexandros Psychogyios (with V. Charmandaris), Gina Panopoulou (with K. Tassis), Charalampos Politakis (with A. Zezas), and Aris Tritsis (with K. Tassis).

2.2. PERSONNEL CHANGES AND NOTABLE EVENTS

In August 2016, Professor N. Kylafis retired after 31 years of service to the Department of Physics and became Emeritus Professor.

In the spring of 2016, Dr. Ioanna Leonidaki and Dr. Paul Sell joined the group of

Prof. Zezas, as postdoctoral researchers coming from the National Observatory of Athens and Texas Tech University (USA) respectively.

In 2016 four doctoral students joined the group: Mr. Ioannis Komis (with K. Tassis), Mr. Konstantinos Kouroumpatzakis (with A. Zezas), Mr. Konstantinos Kovelakas (with A. Zezas), Maria Kopsachili (with A. Zezas); three students started working on their MSc degree under the supervision of members of the group: Mr. Rafail Skalidis (BSc U of Crete, with K. Tassis), and Mr. K. Kokolakis (BSc U. of Crete, with V. Pavlidou), and Mr. G. Maragkakis (BS U. of Crete, with A. Zezas). Six undergraduate students joined the group: Mr. Ioannis Kypriotakis (with A. Zezas) Mr. Stamatios Aliprantis (with A. Zezas), Mr. Alexandros Tsouros (with N. Kylafis), Mr. Grigorios Magkos (with V. Pavlidou), Mr. Aretaios Lalakos (with V. Pavlidou), Ms. Alexandra Pouliasi (with V. Pavlidou).

In the fall of 2016, three MSc students of the group moved to become PhD students abroad: Dimitrios Tanoglidis to the University of Chicago (USA), Christos Panagiotou to the University of Geneva (Switzerland), and Ioanna Psaradaki to SRON (Netherlands). Also, undergraduate student Kyriakos Grammatikos moved to Boston University (USA) to pursue a PhD.

MSc student Dimitrios Tanoglidis was one of the three young researchers from Greece that participated in the 66th Lindau Nobel Laureate Meeting that in 2016 was dedicated to Physics. He was selected by the scientific review panel to be one of the 387 young researchers from 76 countries aged up to 35 (PhD students, postdocs, young faculty).

3. FACILITIES

3.1. SKINAKAS OBSERVATORY

The Skinakas Observatory operates as part of a scientific research collaboration between the University of Crete and the Foundation for Research and Technology-Hellas (FORTH¹). Faculty and staff of the Section, using the facilities of Skinakas, are also affiliated members of the Institute of Electronic Structure and Laser (IESL²) of FORTH. IESL provides additional hardware and logistics support towards the research of the members.

Only the 1.3 m telescope was operating full-time at Skinakas Observatory in 2016. This telescope is a Modified Ritchey-Chrétien telescope with a 1.3 m aperture (focal ratio of f/7.6), which was built by DFM Engineering and Zeiss and became operational in 1995. The 30 cm telescope (focal ratio f/3.2) was also operating, but for a limited time period. A number of modern instruments are permanently available on the 1.3 m telescope. These include several optical CCD cameras with complete filter sets, a long slit optical spectrograph, a high resolution ($R=38,000$) echelle spectrograph, as well as a near-IR wide field camera.

The RoboPol³ Collaboration, consisting of the Skinakas Observatory, the California Institute of Technology (USA), the Inter-University Center for Astronomy and Astrophysics (India), the Max-Planck Institute for Radio Astronomy (Germany), and

¹ For more information on FORTH visit: <http://www.forth.gr>

² For more information on IESL visit: <http://www.iesl.forth.gr>

³ For more information on RoboPol visit: <http://robopol.org/>

the Nicolaus Copernicus University (Poland), continued the normal operations of RoboPol, a novel-design optical polarimeter mounted on the 1.3 m telescope of Skinakas Observatory. The main scientific aim of this collaboration is the study of optical polarization of AGN and other transients, as well as of the configuration of magnetic fields in the interstellar medium.

In 2016, the Stavros Niarchos Foundation funded the development and commissioning of a Wide-Area Linear Optical Polarimeter (WALOP) to be installed at the 1.3m telescope of the Skinakas Observatory. The Skinakas WALOP, currently under development at the Inter-University Center for Astronomy and Astrophysics in Pune, India, will be one of two identical instruments (the second one will be installed at the South African Astronomical Observatories 1.0 m telescope at Surtherland, South Africa) to be used for the upcoming survey project PASIPHAЕ (Polar-Areas Stellar Imaging in Polarisation High Accuracy Experiment). PASIPHAЕ is a collaboration between the University of Crete, Caltech in the United States, the South African Astronomical Observatories, and the Inter-University Center for Astronomy and Astrophysics in India, and it is coordinated by the University of Crete and Professor Konstantinos Tassis. PASIPHAЕ aims to map the three-dimensional structure of intergalactic dust and magnetic fields, and use this information to drastically improve foreground-subtraction capabilities for experiments searching for an inflationary signature in the polarization of the cosmic microwave background. It is expected that the Skinakas WALOP will be commissioned in 2018.

The main projects during the 2016, April-to-November, observing period were:

- Photometry and Spectroscopy of Binaries with a compact star companion.
- Near-infrared observations of HMXBs and nearby galaxies
- Fast Photometry of cataclysmic variables
- AGN monitoring observations
- Optopolarimetric monitoring of gamma-ray--loud blazars and other active galactic nuclei
- Target of Opportunity optopolarimetric follow-up of gamma-ray bursts
- Magnetic field mapping of interstellar clouds using absorption-induced optical polarization properties of light from background stars
- Polarimetry, Photometry, and Spectroscopy of Binaries with a compact star companion
- Narrow-band imaging of Galactic Supernova Remnants
- An H α and near-infrared survey of nearby galaxies

The tradition of "open nights" continued and the Observatory was open to the public for 5 nights, from May until September 2016. They were very successful, with a "full-house" capacity at each night.

More details on Skinakas Observatory, the quality of the site, the telescopes, and the available instrumentation can be found in its recently updated web page at: <http://skinakas.physics.uoc.gr>

3.2. IONOSPHERIC PHYSICS LABORATORY

The Ionospheric Physics Laboratory (IPL), in collaboration with Stanford University, continued the un-interrupted operation of a narrow-band very low frequency (VLF) receiver experiment throughout 2016, and maintained its VLF database. This experiment is used for studying VLF signatures and propagation effects in the lower

ionosphere during times of intense atmospheric electrical activity and the occurrence of transient luminous events (sprites and elves) in the upper atmosphere.

4. COURSES

A number of elective undergraduate and graduate courses, directly related to the research areas covered by the Section, were offered as part of the teaching responsibilities of the faculty members. For the calendar year 2016 these were:

- SPRING SEMESTER 2016
 - "Astrophysics II" (Galactic and extragalactic astrophysics)
 - "Astrophysics III" (Advanced radiative processes and radiative transfer, advanced stellar structure, radiation and dynamics of galaxies)
 - "Production and Transfer of Radiation"
 - "Introduction to Atmospheric Physics"⁴
- FALL SEMESTER 2016
 - "Astrophysics I" (stellar structure and evolution)
 - "Atmospheric Environment"
 - "Observational Astrophysics"
 - "Observational Cosmology"
 - "High Energy Astrophysics"

5. SCIENTIFIC RESEARCH

Here we present a brief description of the major research projects in which members of the Section were involved in 2016. These are grouped by research area and the scientists associated with each project are indicated in parentheses.

The scientific publications that resulted from this work, over the same period, are presented at the end of the report in Section 12.

5.1. THEORETICAL ASTROPHYSICS

- Relativistic effects in blazar jets: The intrinsic properties of blazar jets are obscured by relativistic distortions (boosting of apparent flux, compression of variability timescales, apparent speeds of jet components that can be significantly superluminal). The construction of theoretical models for the population of blazars and the optimization of these models using robust observables not affected or minimally affected by variability can help recover the intrinsic properties of the blazar population even when a source-by-source estimate of the strength of relativistic effects is unavailable. On the other hand, such models can help evaluate methods for the estimation of the relativistic distortions in individual sources, and uncover the local physics in jet emission regions. (Researchers involved: V. Pavlidou, I. Liodakis)
- Astrophysics of ultra-high-energy cosmic rays: With energies higher than 10^{18}

⁴ Also an electronic book, authored by Christos Haldoupis, entitled "Introduction to Atmospheric physics" is freely available in the web site of "Hellenic Academic Ebooks" at <https://repository.kallipos.gr/handle/11419/3273?locale=en>

eV, ultra-high-energy cosmic rays are the most energetic particles known. Their origin remains, to this day, unknown, but they are certain to encode important information about the most extreme processes in the Universe. Our group develops novel approaches to their study, including assessing the possibility of back-tracing of their paths through the Galactic magnetic field to uncover their true arrival directions and thus better constrain their origin; develop tests of a multiple-source-population origin; and use gamma rays resulting from intergalactic cascades to identify the location of their sources. (Researchers involved: V. Pavlidou, G. Magkos, K. Kokolakis)

- Black-hole X-ray binaries: Over the past several years, a rich phenomenology has been accumulated regarding black-hole X-ray binaries. When the sources are in the, so-called, hard X-ray state, a compact jet is always present. In the, so-called, soft X-ray state, no jet is ever detected. In the hard-to-soft transition, the jet disappears eruptively, while in the soft-to-hard transition the jet reappears in a smooth way. All this phenomenology has been explained with a physical model and only one free parameter, the mass-accretion rate. Work on the subject continues. (Researcher involved: N. Kylafis).
- Anomalous X-ray pulsars: Extremely interesting observations have been made recently on the hard X-ray spectra of Anomalous X-ray Pulsars (AXPs). The hard X-rays have luminosity comparable to that of the soft X-rays and they are pulsed, with the rotational period of the neutron stars involved. The pulsed fraction of the hard X-rays increases with the energy of the photons and it becomes $\sim 100\%$ at ~ 100 keV. In addition, the pulse shape changes with X-ray energy. A model to explain all of the above has been worked out and work on it continues. (Researchers involved: N. Kylafis, A. Zezas).
- Monte Carlo simulations of Compton upscattering in accreting neutron-star X-ray binaries: A major issue in High-Energy Astrophysics is where the high-energy, power-law emission occurs in black-hole and neutron-star X-ray binaries. One possibility is the hot, inner, accretion flow and the other is the jet. In a series of papers, we have advocated for the jet and have explained a number of observational constraints using a simple jet model. In a recent paper, we have been able to explain the neutron-star X-ray spectra, using the same simple jet model. (Researchers involved: N. Kylafis, P. Reig).
- Simulations of Galactic star-forming regions: Non-equilibrium chemodynamical multi-fluid non-ideal MHD simulations of star-forming molecular cloud cores. Developed a novel recipe that uses observable molecular abundances to infer the actual 3D shape of molecular cloud cores. (Researchers involved: A. Tritsis, K. Tassis)
- Imprint of MHD waves in interstellar molecular clouds: Using a large suite of ideal MHD simulations the physical origin of the long parallel structures (striations) that appear in the outskirts of molecular clouds has been identified. Striations are the result of fast magnetosonic waves that are excited by Alfvén waves in parts of the clouds that have sharp density boundaries. The current paradigm of streams of gas being the origin of the striations has been demonstrated to be false. (Researchers involved: A. Tritsis, K. Tassis)
- Sources of the gamma-ray background: Modeling of astrophysical populations that may be contributing to the diffuse gamma-ray sky, such as star-forming

galaxies, blazars, and millisecond pulsars. Development of techniques to decompose different contributions to the gamma-ray background and to identify possible exotic signals, such as an annihilation signature from dark-matter subhalos in the Galaxy (Researchers involved: I. Liodakis, V. Pavlidou, A. Pouliasi)

- Large-scale Structure Formation in the Universe: The formation of large-scale structure in the Universe is a cosmic battle between expansion inertia, gravity, and the accelerating influence of dark energy. Using analytic and semi-analytic calculations we follow the formation and growth of structure under different cosmologies. In universes with dark energy, the ultimate fate of structure formation is the halting of structure growth -- a state which can leave observable imprints in the mass-radius relations of local-universe structures such as groups and clusters of galaxies. (Researchers involved: V. Pavlidou)
- Astrostatistics: Application of statistical methods in astrophysical problems. Recent projects include: assessing the significance of apparent correlations between average AGN fluxes at different wavelengths, derivation of star-formation histories from colour-magnitude diagrams, analysis of data taking into account calibration uncertainties, derivation of spectral parameters from X-ray hardness ratios (Researcher involved: A. Zezas as member of the California/Harvard/ASC Astrostatistics Collaboration, V. Pavlidou).
- Modelling of X-ray binary populations: Standard methods of modeling the formation and evolution of high mass X-ray binaries rely on a brute force approach and are relatively inefficient. We add a statistical wrapper that uses a Markov Chain Monte Carlo technique to an already built and maintained binary evolution code which focuses computational power on the region of parameter space of interest. This approach allows efficient fitting of observed binary populations, while taking into account their spatial distribution and the spatially resolved star-formation history of their parent stellar populations (Researchers involved: J. Andrews, K. Kovelakas, A. Zezas).

5.2. OBSERVATIONAL ASTROPHYSICS

5.2.1. OBSERVATIONAL GALACTIC ASTROPHYSICS

- X-ray variability of X-ray binaries (XRB): BHB consist of a black hole orbiting a regular star. When part of the material from the optical companion is accreted on the compact object the system brightens in X-rays. Hard X-ray observations provide a valuable probe of the emission region near the compact object. One of the main features of the environment in the vicinity of the black hole is the iron emission line at 6.4 keV. The goal here is to study the relationship between the line parameters with other observables (mass accretion rate, hardness of the spectrum). We employ advance timing techniques, such as, time lags, Fourier-resolve spectroscopy, and power spectrum analysis (Researchers involved: P. Reig, I. Papadakis).
- Characterization of the variability time scales in Be/X-ray binaries (BeX): BeX consist of a neutron star orbiting a O9e-B2e main-sequence star. The letter "e" stands for emission, as instead of the normal photospheric absorption lines the optical spectra of Be stars display emission lines. Strong infrared emission is

another defining characteristic of Be stars. A third observational property is that the light from a Be star is polarized. The origin of these three observational properties (emission lines, infrared excess, and polarization) lies in a gaseous, equatorially concentrated circumstellar disc around the OB star. This disc constitutes the main source of variability in BeX and the fuel that powers the X-ray emission through accretion. The main objective of this project is to characterize the optical/IR variability time scales of Be/X-ray binaries in correlation with their X-ray activity. (Researchers involved: P. Reig, A. Zezas)

- Study of the aperiodic variability of X-ray pulsars during giant outbursts. The main goal of this project is the definition and unified characterization of accretion-powered pulsar spectral states during giant outbursts. In the last twenty-five years, the discovery of different “states” in the X-ray emission of black-hole binaries (BHB) and neutron-star Low-Mass X-ray Binaries (LMXBs) constituted a large step forward in the understanding of the physics of accretion onto compact objects. While there are numerous studies on the timing and spectral variability of BHB and LMXBs, very little work has been done on High-Mass X-ray Binaries (HMXBs). We have found that Be/X-ray pulsars trace two different branches in the hardness-intensity diagram: the horizontal branch corresponds to a low-intensity state of the source and it is characterized by fast color and spectral changes and high X-ray variability. The diagonal branch is a high-intensity state that emerges when the X-ray luminosity exceeds a critical limit. The two branches may reflect two different accretion modes, depending on whether the luminosity of the source is above or below a critical value. This critical luminosity is mainly determined by the magnetic field strength, hence it differs for different sources. The details of this work can be found in Reig & Nespoli (2013, A&A, 551, A1). (Researchers involved: P. Reig)
- Properties of the Linear Polarization in White Dwarfs. We performed the first linear polarimetric survey of white dwarfs (WDs). Our sample consists of DA and DC spectral types in the SDSS r magnitude range from 13 to 17. Almost all of the 74 objects of our sample are low polarized WDs with polarization degree (PD) smaller than 1%, while only 2 have PD higher than 1%. There is an evidence that on average the isolated WDs of DC type have higher PD (with median PD of 0.78%) than the isolated DA type WDs (with median PD of 0.36%). On the other hand, the median PD of isolated DA type WDs is almost the same, i.e. 0.36% as the median PD of DA type white dwarfs in binary systems with red dwarfs (dM type), i.e. 0.33%. This shows, as expected, that there is no contribution to the PD from the companion if the WD companion is the red dwarf, which is the most common situation for WDs binary systems. We do not find differences in the polarization degree between magnetic and non-magnetic WDs. Because 97% of WDs in our sample have PD lower than 1%, they can be used as faint zero-polarized standard star in the magnitude range from 13 up to 17 of SDSS r filter. They cover the Northern sky between 13 hour to 23 hour in right ascension and from -11 degrees to 78 degrees in declination. (Researchers involved: P. Reig)
- Polarization studies of the Interstellar Medium: After suffering absorption by interstellar cloud dust, starlight may become polarised if the dust grains have a preferential alignment induced by the interstellar magnetic field. Studies of this polarisation with the RoboPol instrument can reveal the magnetic field structure in interstellar clouds, giving important clues about the role of magnetic fields in

the star formation process. (Researchers involved: G. Panopoulou, K. Tassis, D. Blinov)

- Understanding the origin of the “characteristic” width of Interstellar Molecular Cloud Filaments: Recent observational studies based on data obtained by the Herschel Space Observatory has highlighted the filamentary structure of interstellar molecular clouds. Furthermore, it has been argued that the filaments identified in the molecular clouds have a “characteristic” width of ~ 0.1 pc. The origin of this result remained elusive but a review of the algorithms and methods used to derive the width of filaments has revealed that the characteristic width may be an artefact of these techniques and not a real scale in molecular clouds (Researchers involved: G. Panopoulou, I. Psaradaki, R. Skalidis, K. Tassis, J. Andrews)
- Narrow-band imaging of Galactic Supernova Remnants: Supernova Remnants (SNRs) are an important tool for understanding the physical processes that take place in the interaction between the shock wave from a supernova explosion and the stellar ejecta and/or the surrounding interstellar material. Narrow band images of SNRs in our Galaxy allow us to study their morphology and map their excitation, important parameters for understanding how the mechanical energy of the shock wave is transferred in the surrounding material. (Researchers involved: I. Leonidaki, A. Zezas)

5.2.2. OBSERVATIONAL EXTRAGALACTIC ASTROPHYSICS

- Study of X-ray sources in the Small Magellanic Cloud: A study of the X-ray population in the Small Magellanic Cloud is underway, using Chandra observations of the central region of the Small Magellanic Cloud, dominated by a recent burst of star formation. Study of the optical counterparts and characterization of the star formation history in the specific areas of the Chandra sources has been conducted using optical imaging and spectroscopy with the 6m-Magellan Telescope, and the 4m-Anglo-Australian Telescope (2df). The goal of these studies is to understand the nature of the X-ray binaries in the SMC and study their relation to its star-formation history (Researchers involved: A. Zezas, J. Andrews).
- X-ray source populations in nearby galaxies: Studies of the discrete X-ray source populations (in particular accreting sources) in nearby galaxies and their connection with their parent stellar populations (star-formation history, metallicity, etc) and star-cluster parameters. Studied objects cover the full spectrum of galaxies, ranging from dwarf-irregular star-forming galaxies to spiral and elliptical galaxies (Researchers involved: A. Zezas, P. Sell, K. Anastasopoulou, C. Politakis, J. Andrews).
- Ultraluminous X-ray sources in nearby galaxies: A subset of ultraluminous X-ray sources (those with luminosities of less than $10^{39} \text{ erg s}^{-1}$) are thought to be powered by the accretion of gas onto black holes with masses of $\sim 5\text{--}20$. The X-ray and radio emission are coupled in such Galactic sources, the radio emission originates in a relativistic jet thought to be launched from the innermost regions near the black hole, with the most powerful emission occurring when the rate of infalling matter approaches a theoretical maximum

(the Eddington limit). Studies of ULXs include: (a) investigations of the populations of these extreme objects in nearby galaxies and their dependence on age and metallicity; (b) investigations of individual objects such as a new luminous ($>10^{39} \text{ erg s}^{-1}$) X-ray source in the nearby galaxy M 31, which showed extremely high radio luminosity and X-ray variability on a timescale of tens of minutes, indicating that the source is powered by accretion close to the Eddington limit for a stellar-mass black hole. (Researchers involved: P. Reig, A. Zezas, K. Anastasopoulou, K. Kouvlikas).

- Hard X-ray observations of nearby galaxies: The NuSTAR observatory gives us an unprecedented view of the hard X-ray emission from nearby galaxies. We are leading the development of diagnostic tools for the characterization of the compact object and accretion state of X-ray binaries, and their application in X-ray observations of nearby galaxies with the NuSTAR and other X-ray telescopes. (Researchers involved: G. Maragkakis, K. Anastasopoulou, A. Zezas).
- Extragalactic supernova remnant populations: Multiwavelength studies of the supernova remnant populations in nearby galaxies using data from the Chandra X-ray observatory and narrow-band imaging data and spectroscopy from the Skinakas observatory, as well as other observatories. The goal of this project is to understand the populations of SNRs in different wavelengths in a variety of environments (Researchers involved: A. Zezas, M. Kopsacheili, I. Leonidaki).
- Massive stars in nearby galaxies: Massive stars are important tools for understanding stellar evolution. Observations of massive-star populations in nearby galaxies allow us to constrain their recent star-formation history, their dependence on parameters such as age and metallicity, and their connection with the compact object populations in these galaxies as witnessed in X-ray observations. (Researchers involved: S. Williams, A. Zezas).
- X-ray variability studies of AGN: the work on the study of the variability properties of the iron line in bright Seyferts, and the study of the "reverberation", negative time lags at high frequencies in a few AGN, using XMM-Newton data, was completed, and a paper was submitted to MNRAS. At the same time, a project regarding the energy dependence of the X-ray power-spectra of a few bright AGN was also completed, using XMM-Newton light data. The results should be published in the next year. A collaboration with colleagues from the Astronomical Institute of the Academy of Sciences of the Czech Republic was established. Their theoretical "response" functions of accretion discs to X-ray flashes from "point-like" X-ray sources will be of major significance in the forthcoming study of the iron line variability, which will continue in 2014. (Researchers involved: I. Papadakis, A. Epitropakis).
- Optopolarimetric monitoring of Active Galactic Nuclei: the polarisation properties of the optical (synchrotron) emission from blazars and other AGN encodes important information about the magnetic field configuration in the relativistic jet powering these systems. Using the RoboPol polarimeter, the optopolarimetric properties of about 100 AGN are regularly monitored throughout the Skinakas observing season - the largest-scope such effort in the world today. (Researches involved: D. Blinov, G. Panopoulou, V. Pavlidou, I. Papadakis, N. Kylafis, K. Tassis, P. Reig, I. Liodakis)

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- Multiwavelength studies of interacting galaxies: This is a comprehensive study of a large sample of interacting galaxies with the Spitzer Space Telescope and the Chandra X-ray Observatory. Supporting simulations of galaxy interactions are used to model as a function of the merger stage the evolution of the star-forming and AGN activity, and the energy output of the interacting galaxies in different wavebands. The goal of this study is to address the connection between galaxy interactions and induced star-formation and AGN activity (Researchers involved: A. Zezas).
 - A census of star-forming activity in the local Universe (the Star-formation Reference Survey): This is a systematic study of the star-formation and AGN activity in a representative sample of IR-selected galaxies in the local Universe. The main goal of this project is to investigate the connection between galactic activity (star formation and AGN) and galactic parameters such as stellar mass, dust content, and morphology. First results from this effort include a mass function of disks and bulges in the local Universe (P. Bonfini's PhD thesis), and a census of AGN activity in local galaxies (Maragkoudakis et al, in prep), and a study of the relation between star-formation and stellar mass in sub-galactic scales (Maragkoudakis et al., 2016). On-going projects include H α and NIR imaging, and derivation of scaling relations between the X-ray emission and star-formation rate and stellar mass of the SFRS galaxies. (Researchers involved: A. Zezas, A. Maragkoudakis, K. Kouroubatzakis, P. Sell)
 - Mid-/Far-infrared and radio continuum properties of Luminous and Ultraluminous Infrared Galaxies (LIRGs/ULIRGs): This project was based on observations with the Spitzer Space Telescope in order to explore the mid-infrared properties of ULIRGs. The main goal is to improve our understanding of the dominant mechanism of the energy source (accretion onto an active nucleus or a super-massive starburst) in these galaxies and ascertain their role in galaxy evolution. There are various components of this project. One major component is the characterization of the mid- and far-infrared emission for a complete flux-limited sample of local LIRGs/ULIRGs, the Great Observatories All-Sky Survey (GOALS) galaxy sample, using the Spitzer and Herschel Space telescopes. A second is the analysis of the radio continuum observations of a GOALS subsample obtained with the VLA and explore the connection between the radio and infrared emission. (Researchers involved: V. Charmandaris).
 - UV to near-IR morphology of Luminous and Ultraluminous Infrared Galaxies (LIRGs/ULIRGs): This project was based on observations with the Hubble Space Telescope of the Great Observatories All-Sky Survey (GOALS) galaxy sample. Its main goal is to develop a consistent morphological classification of these local systems in order to study the evolution of similar galaxies at high-z. (Researchers involved: V. Charmandaris, A. Psychogyios).
 - Star formation and stellar populations in Compact Groups: This project originated from the analysis of mid- and far-infrared observations of a sample of Hickson Compact Groups obtained with the Spitzer Space Telescope and Herschel Space Observatory. The analysis was extended to a larger sample of ~ 1700 compact galaxy groups identified in the Sloan Digital Sky Survey, with ancillary data from GALEX and WISE. The main goal is to study the effects of environment on the evolution of galaxies and their nuclear activity (Researchers involved: V. Charmandaris).

5.3. ATMOSPHERIC & IONOSPHERIC PHYSICS

- Earth Observation and climate Project: Research work on Earth Observation and the Earth's Radiation Budget is an ongoing project. Modelling work of the radiation forcing of aerosols on a planetary scale includes the effects of aerosols on the solar ultraviolet, visible and near-infrared radiation reaching the Earth's surface. Model input data include satellite data from the NASA EOS satellites, Aqua and Terra. Ground-based data include the AERONET (Aerosol Robotic Network) site operated in Crete and provided by NASA Goddard. Climate research includes the effects of the El Nino phenomenon on the surface radiation budget over the tropical Pacific Ocean. Collaboration with NASA Langley and the Meteorological Institute of the University of Munich on the heat budgets of enclosed seas, such as the Mediterranean, Black and Red seas is ongoing.: (Researchers involved: I. Vardavas).
- Modelling the Evolution of Planetary Atmospheres Project: Research on modelling the evolution of planetary atmospheres has focussed on the development of a radiative/convective-photochemical-microphysical model for the global mean vertical atmospheric structure of the Precambrian Earth and of Titan. the Titan model has been validated against data from the recent Cassini/Huygens mission to Titan. A model for the formation of the haze layer that surrounds Titan has been developed. Work on the evolution of ultraviolet and XUV radiation of G-type solar like stars, which affects the atmospheric chemical composition of planets orbiting such stars, is ongoing with planned applications to exoplanets around G-type stars. (Researchers involved: I. Vardavas)
- Ionospheric and Upper Atmospheric Physics: the research topics under study relate to the plasma physics and electrodynamics of irregular ionospheric phenomena occurring at mid-latitude, and problems associated with the interaction and coupling of the neutral mesosphere and lower thermosphere with the earth's ionosphere. During 2016 our research focused on the following topics: 1) the effects on VLF (very low frequency) electromagnetic wave propagation and VLF response signatures associated with "transient luminous events", such as sprites, elves and gigantic jets, which are atmospheric electricity (thunderstorm and lightning) phenomena in the upper atmosphere and lower ionosphere, modelling the lifetimes of lightning-produced VLF perturbations, 2) studies of the annual and seasonal variations of mid-latitude sporadic E layers as well as the effect of lightning on sporadic E occurrence, and 3) effects of X-ray solar flare events on the lower ionosphere using Arecibo radar incoherent scatter measurements and modeling. (Researchers involved: C. Haldoupis)

6. RESEARCH FUNDING

The following projects, funded by national and international agencies, enabled the research activities of the Section during the period of the report.

- EU funded International Research Staff Exchange Scheme Grant for the "The Physics of the Most Luminous Galaxies", (P.I.: V. Charmandaris, budget: €171,800, duration: 2012-2016)

- Marie Curie Career Integration Grant "JetPop", entitled "Unveiling the Physics of the Most Active of Galaxies: Using Blazars as Laboratories to Study Supermassive Black Holes and Relativistic Jets", (P.I.: V. Pavlidou, budget: €100,000, duration: 2012-2016)
- Marie Curie International Reintegration Grant "SFOset", entitled "Onset of Star Formation: Connecting Theory and Observations Coupling Dynamics and Interstellar Chemistry in Molecular Cloud Cores", (P.I.: K. Tassis, budget: €100,000, duration: 2012-2016)
- ERC Consolidator Grant "A-Bingos", entitled "Accreting Binary populations in Nearby Galaxies: Observations and Simulations", (P.I.: A. Zezas, budget: €1,242,000, duration: 2014- 2019)
- H2020 RISE, entitled "ASTROSTAT: Development of novel statistical tools for the analysis of astronomical data", (P.I.: A. Zezas, budget: €526,500, duration: 2016- 2020)
- Stavros Niarchos Foundation Grant in support of the project "PASIPAHE" (P.I.: K. Tassis, budget: \$1,457,000)

7. COLLABORATIONS WITH OTHER INSTITUTES

Members of the group are actively collaborating with scientists affiliated with the following universities and research institutes:

- GREECE
 - Foundation for Research and Technology – Hellas (FORTH), Heraklion
 - National Observatory of Athens, Athens
 - Technical Education Institute of Crete, Dept. of Electrical Engineering, Heraklion
 - University of Athens, Dept. of Physics, Athens
 - University of the Aegean, Dept. of Environment, Mytilene
 - University of Ioannina, Dept. of Physics, Ioannina
- INTERNATIONAL
 - Astronomical Institute of the Czech Academy of Sciences, Czech Republic
 - Aalto University, Finland
 - California Institute of Technology, Spitzer Science Center, Pasadena, CA, USA
 - CEA/Saclay, Service d'Astrophysique, Paris, France
 - Cornell University, Astronomy Department, Ithaca, NY, USA
 - Eötvös-Lenard University, Budapest, Hungary
 - ETH, Zurich, Switzerland
 - Geophysical Institute, Bulgarian Academy of Sciences, Sofia, Bulgaria
 - Harvard-Smithsonian, Center for Astrophysics, Cambridge, MA, USA
 - Hebrew University of Jerusalem, Jerusalem, Israel
 - Institut d'Astrophysique de Paris, France
 - Imperial College, London, U.K.
 - Max-Planck-Institut für Extraterrestrische Physik, Garching, Germany
 - Max-Planck-Institut für Kernphysik, Heidelberg, Germany
 - Max-Planck-Institut für Radioastronomie, Bonn, Germany
 - NASA Goddard Space Flight Center, Greenbelt, MD, USA
 - NASA Jet Propulsion Laboratory, Pasadena, CA, USA
 - NASA Langley Division of Atmospheric Sciences, Langley, VA, USA
 - Nicolaus Copernicus Astronomical Center, Warsaw & Torun, Poland
 - Northwestern University, Evanston, IL, USA
 - Observatoire de Paris, Paris, France

- Oxford University, Oxford, UK
- Rome Observatory, Rome, Italy
- South African Astronomical Observatories, Sutherland, South Africa
- Shanghai Astronomical Observatory, Shanghai, China
- Stanford University, Palo Alto, CA, USA
- Université de Geneve, Geneva, Switzerland
- Université de Rennes, Rennes, France
- University of Alicante, Alicante, Spain
- University of Durham, Durham, UK
- University of Napoli Federico, Napoli, I
- University of Zielona Gora, Poland
- University of Saskatchewan, Canada
- University of Southampton, Southampton, UK
- University of Texas at Austin, Austin, TX, USA
- University of Valencia, Valencia, Spain

8. NATIONAL & INTERNATIONAL COMMITTEES

During the period covered by this report, members of the Section were in a number of national and international committees. More specifically:

Prof. V. Charmandaris is serving as the Director of the Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing of the National Observatory of Athens since September 2013. He also serves as the representative of Greece to the Board of Directors of "Astronomy & Astrophysics".

Prof. N. Kylafis is serving as the President of Greek National Committee for Astronomy. He also served until 31 August 2016 as a member of the Council of the University of Crete.

Prof. I. Papadakis is serving as the Chairman of the Department of Physics since October 2015.

Prof. Pavlidou was elected a member of the Governing Council of the Hellenic Astronomical Society in 2016.

Dr. P. Reig was re-elected a member of the Governing Council of the Hellenic Astronomical Society in 2016.

Prof. I. Vardavas is on the Editorial Board of the Environmental Modelling and Software Journal.

Ms. G. V. Panopoulou is serving as the Greek Representative to the International Tournament of Physicists.

9. CONFERENCE & WORKSHOP ORGANIZATION

The annual "European Week of Astronomy and Space Science 2016" (EWASS 2016) took place in Athens from the 4th to the 8th of July with significant involvement of the group (<http://eas.unige.ch/EWASS2016/organizers.jsp>).

- Prof. Kylafis was the co-chair of the EWASS Scientific Organizing Committee

- (SOC) and a member of the EWASS Hosting Committee.
- Prof. Charmandaris was the chair of the EWASS Hosting Committee and a member of the SOC.
- Prof. Tassis (chair) and Prof. Pavlidou organized the two-day symposium S2: "Understanding CMB Polarization Foregrounds - Clearing the Path to Inflationary B-modes" (<http://eas.unige.ch/EWASS2016/session.jsp?id=S2>).

The 2016 "Network of European Observatories in the North (NEON)" Observing School was hosted at the Physics Department and the Skinakas Observatory from June 19th to July 2nd. The local coordinators were Prof. Papadakis and Dr. Reig (http://www.iap.fr/neon/neon_schools/2016/), while Dr. Reig, Prof. Kylafis, Prof. Papamastorakis, Prof. Pavlidou, and Prof. Zezas were some of the tutors and lecturers.

The annual RoboPol 2016 meeting took place July 9-10 in Athens at the Observatory of Athens (Thesion) and was organized by Prof. Pavlidou and her group.

10. PUBLIC OUTREACH

All members of the Section are involved in a number of public outreach activities throughout the year. These consist of giving public lectures, mostly in the island of Crete, along with dedicated tours to the facilities of Skinakas Observatory, as well as TV and radio interviews. The group also supports the activities organized by the local amateur astronomical societies in Crete.

The Skinakas observatory opened its doors to the public for five Sunday nights on May 24, June 21, July 26, August 8, and September 6. Hundreds of people visited the observatory, where they were guided to the facilities by members of the Section and had the chance to look through the main 1.3 m telescope.

Vasiliki Pavlidou visited the Gazi high school and the 11th Heraklion high school where she gave a presentation to students on Physics education and astrophysics research at the University of Crete.

V. Pavlidou gave one of the invited talks at the secondary-education themed conference "Society and School: A Relationship Under Negotiation." Her talk was entitled "Motivation and Action in Science Education."

N. Kylafis gave a public talk entitled "From the planets and the stars to black holes and gravitational waves" in Agrinion.

I. Papadakis gave public talks in Sitia and Chania on the detection of Gravitational waves.

The Astronomy Group actively participated in the European Researchers' Night, which has become one of the most important events in science for the local community of Heraklion (Crete). In its latest edition (October 2016) more than 2500 visitors turned up and enjoyed the exhibitions and talks with experts in many Physical Sciences. The vast majority of the visitors were Secondary School students. The Skinakas observatory participated with the presence of two senior astronomers (I. Papadakis and P. Reig), two PhD students (G. Panopoulou and ...)

and three technicians (G. Paterakis, A. Kougentakis, and A. Steiakaki). The show included video projections of the observatory and a selection of pictures of cosmic objects obtained with the cameras of the observatory.

K. Tassis and V. Pavlidou co-authored an article in the local newspaper "ΠΑΤΡΙΣ" #20839, 22 July 2016 advertising the PASIPHAE project with the title: "PASIPHAΕ: "Ξεσκονίζοντας" τον δρόμο προς τη Μεγάλη Έκρηξη".

Considerable excitement about the great discovery potential of the PASIPHAΕ project and its implications to several areas in modern astrophysics and cosmology was also evident by the extensive media coverage it has received since the announcement of its commencement by a press release made by the EWASS2016 conference.

11. VISITORS

A total of 13 scientists visited our Department during the 2015 calendar year in order to collaborate with staff members of the Section and/or give seminars. These individuals were: Dr. T. Diaz-Santos (Univ. Diego Portales, Chile), Prof. Hans Kristian Eriksen (University of Oslo, Norway), Dr. Anastasios Fragos (Geneva Observatory, Switzerland), Prof. Massimiliano Galeazzi (University of Miami, USA), Dr. G. Leloudas (University of Copenhagen, Denmark), Dr. Fabrizio Nicastro (Rome Astronomical Observatory, Italy), Dr. Despina Panoglou, (University of Sao Paulo, Brazil), Dr. Vassilis Paschalidis (Princeton University, USA), Dr. Stephen Potter (South African Astronomical Observatory, South Africa), Prof. A. N. Ramaprakash (IUCAA, India), Prof. Antony Readhead (California Institute of Technology, USA), Dr. J.-L. Starck (CEA/Saclay), Prof. J. Trumper (MPE-Garching, Germany), Prof. Amanda Weinstein (Iowa State University, USA).

12. PUBLICATIONS

The following **56** publications of the members of the Section appeared in print in international refereed journals (according to ISI/WoS, NASA/ADS) during the 2016 calendar year. This corresponds to 3.5 refereed publications per PhD researcher. For each publication, the names of the members of the Section are underlined.

- 1.** Ahnen, M. L., Ansoldi, S., Antonelli, L. A., Antoranz, P., Babic, A., Banerjee, B., Bangale, P., Barres de Almeida, U., Barrio, J. A., Becerra González, J., Bednarek, W., Bernardini, E., Biasuzzi, B., Biland, A., Blanch, O., Bonnefoy, S., Bonnoli, G., Borracci, F., Bretz, T., Buson, S., Carosi, A., Chatterjee, A., Clavero, R., Colin, P., Colombo, E., Contreras, J. L., Cortina, J., Covino, S., Da Vela, P., Dazzi, F., De Angelis, A., De Lotto, B., de Oña Wilhelmi, E., Di Pierro, F., Domínguez, A., Dominis Prester, D., Dorner, D., Doro, M., Einecke, S., Eisenacher Glawion, D., Elsaesser, D., Fernández-Barral, A., Fidalgo, D., Fonseca, M. V., Font, L., Frantzen, K., Fruck, C., Galindo, D., García López, R. J., Garczarczyk, M., Garrido Terrats, D., Gaug, M., Giammaria, P., Godinović, N., González Muñoz, A., Gora, D., Guberman, D., Hadasch, D., Hahn, A., Hanabata, Y., Hayashida, M., Herrera, J., Hose, J., Hrupec, D., Hughes, G., Idec, W., Kodani, K., Konno, Y., Kubo, H., Kushida, J., La Barbera, A., Lelas, D., Lindfors, E., Lombardi, S., Longo, F., López, M., López-Coto, R., Majumdar, P., Makariev, M., Mallot, K.,

- Maneva, G., Manganaro, M., Mannheim, K., Maraschi, L., Marcote, B., Mariotti, M., Martínez, M., Mazin, D., Menzel, U., Miranda, J. M., Mirzoyan, R., Moralejo, A., Moretti, E., Nakajima, D., Neustroev, V., Niedzwiecki, A., Nievas Rosillo, M., Nilsson, K., Nishijima, K., Noda, K., Nogués, L., Orito, R., Overkemping, A., Paiano, S., Palacio, J., Palatiello, M., Paneque, D., Paoletti, R., Paredes, J. M., Paredes-Fortuny, X., Pedalletti, G., Perri, L., Persic, M., Poutanen, J., Prada Moroni, P. G., Prandini, E., Puljak, I., Rhode, W., Ribó, M., Rico, J., Rodriguez Garcia, J., Saito, T., Satalecka, K., Schultz, C., Schweizer, T., Shore, S. N., Sillanpää, A., Sitarek, J., Snidaric, I., Sobczynska, D., Stamerra, A., Steinbring, T., Strzys, M., Takalo, L., Takami, H., Tavecchio, F., Temnikov, P., Terzić, T., Tesaro, D., Teshima, M., Thaele, J., Torres, D. F., Toyama, T., Treves, A., Verguilov, V., Vovk, I., Ward, J. E., Will, M., Wu, M. H., Zanin, R., Blinov, D. A., Chen, W. P., Efimova, N. V., Forné, E., Grishina, T. S., Hovatta, T., Jordan, B., Kimeridze, G. N., Kopatskaya, E. N., Koptelova, E., Kurtanidze, O. M., Kurtanidze, S. O., Lähteenmäki, A., Larionov, V. M., Larionova, E. G., Larionova, L. V., Ligustri, R., Lin, H. C., McBreen, B., Morozova, D. A., Nikolashvili, M. G., Raiteri, C. M., Ros, J. A., Sadun, A. C., Sigua, L. A., Tornikoski, M., Troitsky, I. S., Villata, M., *Long-term multi-wavelength variability and correlation study of Markarian 421 from 2007 to 2009*, *Astronomy & Astrophysics*, 2016, **593**, 91, 12pp.
2. Akras, S., Clyne, N., Boumis, P., Monteiro, H., Gonçalves, D. R., Redman, M. P., Williams, S., *Deciphering the bipolar planetary nebula Abell 14 with 3D ionization and morphological studies*, *Monthly Notices of the Royal Astronomical Society*, 2016. **457**(4): p. 3409-3419.
 3. Anastasopoulou, K., Zezas, A., Ballo, L., Della Ceca, R., *A deep Chandra observation of the interacting star-forming galaxy Arp 299*, *Monthly Notices of the Royal Astronomical Society*, 2016. **460**(4): p.3570-3586.
 4. Andrews, J. J., Agüeros, M., Brown, W. R., Gosnell, N. M., Gianninas, A., Kilić, M., Koester, D., *Today a Duo, but Once a Trio? The Double White Dwarf HS 2220+2146 May Be a Post-blue Straggler Binary*, *The Astrophysical Journal*, 2016, **828**(1),38, 11pp.
 5. Angelakis, E., Hovatta, T., Blinov, D., Pavlidou, V., Kiehlmann, S., Myserlis, I., Böttcher, M., Mao, P., Panopoulou, G. V., Liodakis, I., King, O. G., Baloković, M., Kus, A., Kylafis, N., Mahabal, A., Marecki, A., Paleologou, E., Papadakis, I., Papamastorakis, I., Pazderski, E., Pearson, T. J., Prabhudesai, S., Ramaprakash, A. N., Readhead, A. C. S., Reig, P., Tassis, K., Urry, M., Zensus, J. A., *RoboPol: the optical polarization of gamma-ray-loud and gamma-ray-quiet blazars* *Monthly Notices of the Royal Astronomical Society*, 2016. **463**(3): p.3365-3380.
 6. Antoniou, V., Zezas, A., *Star formation history and X-ray binary populations: the case of the Large Magellanic Cloud*, *Monthly Notices of the Royal Astronomical Society*, 2016. **459**(1): p.528-553.
 7. Baloković, M., Paneque, D., Madejski, G., Furniss, A., Chiang, J., Ajello, M., Alexander, D. M., Barret, D., Blandford, R. D., Boggs, S. E., Christensen, F. E., Craig, W. W., Forster, K., Giommi, P., Grefenstette, B., Hailey, C., Harrison, F. A., Hornstrup, A., Kitaguchi, T., Koglin, J. E., Madsen, K. K., Mao, P. H., Miyasaka, H., Mori, K., Perri, M., Pivovarov, M. J., Puccetti, S., Rana, V., Stern, D., Tagliaferri, G., Urry, C. M., Westergaard, N. J., Zhang, W. W., Zoglauer, A., NuSTAR Team, Archambault, S., Archer, A., Barnacka, A., Benbow, W., Bird, R., Buckley, J. H., Bugaev, V., Cerruti, M., Chen, X., Ciupik, L., Connolly, M. P., Cui, W., Dickinson, H. J., Dumm, J., Eisch, J. D., Falcone, A., Feng, Q., Finley, J. P., Fleischhack, H., Fortson, L., Griffin, S., Griffiths, S. T., Grube, J., Gyuk, G., Huetten, M., Håkansson, N., Holder, J., Humensky, T. B., Johnson, C. A., Kaaret, P., Kertzman, M., Khassen, Y., Kieda, D., Krause, M., Krennrich, F., Lang, M. J.,

- Maier, G., McArthur, S., Meagher, K., Moriarty, P., Nelson, T., Nieto, D., Ong, R. A., Park, N., Pohl, M., Popkow, A., Pueschel, E., Reynolds, P. T., Richards, G. T., Roache, E., Santander, M., Sembroski, G. H., Shahinyan, K., Smith, A. W., Staszak, D., Telezhinsky, I., Todd, N. W., Tucci, J. V., Tyler, J., Vincent, S., Weinstein, A., Wilhelm, A., Williams, D. A., Zitzer, B., VERITAS Collaboration, Ahnen, M. L., Ansoldi, S., Antonelli, L. A., Antoranz, P., Babic, A., Banerjee, B., Bangale, P., Barres de Almeida, U., Barrio, J. A., Becerra González, J., Bednarek, W., Bernardini, E., Biasuzzi, B., Biland, A., Blanch, O., Bonnefoy, S., Bonnoli, G., Borracci, F., Bretz, T., Carmona, E., Carosi, A., Chatterjee, A., Clavero, R., Colin, P., Colombo, E., Contreras, J. L., Cortina, J., Covino, S., Da Vela, P., Dazzi, F., De Angelis, A., De Lotto, B., de Oña Wilhelmi, E., Delgado Mendez, C., Di Pierro, F., Dominis Prester, D., Dorner, D., Doro, M., Einecke, S., Elsaesser, D., Fernández-Barral, A., Fidalgo, D., Fonseca, M. V., Font, L., Frantzen, K., Fruck, C., Galindo, D., García López, R. J., Garczarczyk, M., Garrido Terrats, D., Gaug, M., Giammaria, P., Glawion (Eisenacher, D., Godinović, N., González Muñoz, A., Guberman, D., Hahn, A., Hanabata, Y., Hayashida, M., Herrera, J., Hose, J., Hrupec, D., Hughes, G., Idec, W., Kodani, K., Konno, Y., Kubo, H., Kushida, J., La Barbera, A., Lelas, D., Lindfors, E., Lombardi, S., Longo, F., López, M., López-Coto, R., López-Oramas, A., Lorenz, E., Majumdar, P., Makariev, M., Mallot, K., Maneva, G., Manganaro, M., Mannheim, K., Maraschi, L., Marcote, B., Mariotti, M., Martínez, M., Mazin, D., Menzel, U., Miranda, J. M., Mirzoyan, R., Moralejo, A., Moretti, E., Nakajima, D., Neustroev, V., Niedzwiecki, A., Nievas Rosillo, M., Nilsson, K., Nishijima, K., Noda, K., Orito, R., Overkemping, A., Paiano, S., Palacio, J., Palatiello, M., Paoletti, R., Paredes, J. M., Paredes-Fortuny, X., Persic, M., Poutanen, J., Prada Moroni, P. G., Prandini, E., Puljak, I., Rhode, W., Ribó, M., Rico, J., Rodriguez Garcia, J., Saito, T., Satalecka, K., Scapin, V., Schultz, C., Schweizer, T., Shore, S. N., Sillanpää, A., Sitarek, J., Snidaric, I., Sobczynska, D., Stamerra, A., Steinbring, T., Strzys, M., Takalo, L., Takami, H., Tavecchio, F., Temnikov, P., Terzić, T., Tescaro, D., Teshima, M., Thaele, J., Torres, D. F., Toyama, T., Treves, A., Verguilov, V., Vovk, I., Ward, J. E., Will, M., Wu, M. H., Zanin, R., MAGIC Collaboration, Perkins, J., Verrecchia, F., Leto, C., Böttcher, M., Villata, M., Raiteri, C. M., Acosta-Pulido, J. A., Bachev, R., Berdyugin, A., Blinov, D. A., Carnerero, M. I., Chen, W. P., Chinchilla, P., Damjanovic, G., Eswaraiah, C., Grishina, T. S., Ibryamov, S., Jordan, B., Jorstad, S. G., Joshi, M., Kopatskaya, E. N., Kurtanidze, O. M., Kurtanidze, S. O., Larionova, E. G., Larionova, L. V., Larionov, V. M., Latev, G., Lin, H. C., Marscher, A. P., Mokrushina, A. A., Morozova, D. A., Nikolashvili, M. G., Semkov, E., Smith, P. S., Strigachev, A., Troitskaya, Yu. V., Troitsky, I. S., Vince, O., Barnes, J., Güver, T., Moody, J. W., Sadun, A. C., Sun, S., Hovatta, T., Richards, J. L., Max-Moerbeck, W., Readhead, A. C. R., Lähteenmäki, A., Tornikoski, M., Tammi, J., Ramakrishnan, V., Reinthal, R., Angelakis, E., Fuhrmann, L., Myserlis, I., Karamanavis, V., Sievers, A., Ungerechts, H., Zensus, J. A., *Multiwavelength Study of Quiescent States of Mrk 421 with Unprecedented Hard X-Ray Coverage Provided by NuSTAR in 2013*, The Astrophysical Journal, 2016, **819**(2), 156, 30 pp.
8. Basu-Zych, A. R., Lehmer, B., Fragos, T., Hornschemeier, A., Yukita, M., Zezas, A., Ptak, A., *Exploring the Overabundance of ULXs in Metal- and Dust-poor Local Lyman Break Analogs*, The Astrophysical Journal, 2016, **818**(2), 140, 13 pp.
9. Bhagwan, Jai, Gupta, A. C., Papadakis, I. E., Wiita, Paul J., *Flux and spectral variability of the blazar PKS 2155 -304 with XMM-Newton: Evidence of particle acceleration and synchrotron cooling*, New Astronomy, 2016, **44**, p. 21-28.

10. Bitsakis, T., Dultzin, D., Ciesla, L., Díaz-Santos, T., Appleton, P. N., Charmandaris, V., Krongold, Y., Guillard, P., Alatalo, K., Zezas, A., González, J., Lanz, L., *Studying the evolution of galaxies in compact groups over the past 3 Gyr - II. The importance of environment in the suppression of star formation*, Monthly Notices of the Royal Astronomical Society, 2016. **459**(1): p.957-970.
11. Blinov, D., Pavlidou, V., Papadakis, I., Kiehlmann, S., Liodakis, I., Panopoulou, G. V., Pearson, T. J., Angelakis, E., Baloković, M., Hovatta, T., Joshi, V., King, O. G., Kus, A., Kylafis, N., Mahabal, A., Marecki, A., Myserlis, I., Paleologou, E., Papamastorakis, I., Pazderski, E., Prabhudesai, S., Ramaprakash, A., Readhead, A. C. S., Reig, P., Tassis, K., Zensus, J. A., *RoboPol: do optical polarization rotations occur in all blazars?* Monthly Notices of the Royal Astronomical Society, 2016. **462**(2): p.1775-1785.
12. Blinov, D., Pavlidou, V., Papadakis, I. E., Hovatta, T., Pearson, T. J., Liodakis, I., Panopoulou, G. V., Angelakis, E., Baloković, M., Das, H., Khodade, P., Kiehlmann, S., King, O. G., Kus, A., Kylafis, N., Mahabal, A., Marecki, A., Modi, D., Myserlis, I., Paleologou, E., Papamastorakis, I., Pazderska, B., Pazderski, E., Rajarshi, C., Ramaprakash, A., Readhead, A. C. S., Reig, P., Tassis, K., Zensus, J. A., *RoboPol: optical polarization-plane rotations and flaring activity in blazars* Monthly Notices of the Royal Astronomical Society, 2016. **457**(2): p.2252-2262.
13. Brightman, M., Harrison, F., Walton, D. J., Fuerst, F., Hornschemeier, A., Zezas, A., Bachetti, M., Grefenstette, B., Ptak, A., Tendulkar, S., Yukita, M., *Spectral and Temporal Properties of the Ultraluminous X-Ray Pulsar in M82 from 15 years of Chandra Observations and Analysis of the Pulsed Emission Using NuSTAR*, The Astrophysical Journal, 2016, **816**(2), 60, 9 pp.
14. Casadio, C., Gómez, J., Jorstad, S., Marscher, A., Grandi, P., Larionov, V., Lister, M., Smith, P., Gurwell, M., Lähteenmäki, A., Agudo, I., Molina, S., Bala, V., Joshi, M., Taylor, B., Williamson, K., Kovalev, Y., Savolainen, T., Pushkarev, A., Arkharov, A., Blinov, D., Borman, G., Di Paola, A., Grishina, T., Hagen-Thorn, V., Itoh, R., Kopatskaya, E., Larionova, E., Larionova, L., Morozova, D., Rastorgueva-Foi, E., Sergeev, S., Tornikoski, M., Troitsky, I., Thum, C., Wiesemeyer, H., *The Connection between the Radio Jet and the γ -ray Emission in the Radio Galaxy 3C 120 and the Blazar CTA 102*, Galaxies, 2016, **4**(4), 34, 9pp.
15. Clemens, Dan P., Tassis, K., Goldsmith, Paul F., *The Magnetic Field of L1544. I. Near-infrared Polarimetry and the Non-uniform Envelope*, The Astrophysical Journal, 2016, **833**(2), p. 176-192.
16. Ciesla, L., Boselli, A., Elbaz, D., Boissier, S., Buat, V., Charmandaris, V., Schreiber, C., Béthermin, M., Baes, M., Boquien, M., De Looze, I., Fernández-Ontiveros, J. A., Pappalardo, C., Spinoglio, L., Viaene, S., *The imprint of rapid star formation quenching on the spectral energy distributions of galaxies*, Astronomy & Astrophysics, 2016, **585**, 43, 12 pp.
17. Diamond-Stanic, A. M., Coil, A. L., Moustakas, J., Tremonti, C. A., Sell, P. H., Mendez, A. J., Hickox, R. C., Rudnick, G. H., *Galaxies Probing Galaxies at High Resolution: Co-rotating Gas Associated with a Milky Way Analog at $z=0.4$* , The Astrophysical Journal, 2016, **824**(1), 24, 13pp.
18. Emmanoulopoulos, D., McHardy, I. M., Vaughan, S., Papadakis, I. E., *Extensive X-ray variability studies of NGC 7314 using long XMM-Newton observations*, Monthly Notices of the Royal Astronomical Society, 2016. **460**(3): p.2413-2431.
19. Emmanoulopoulos, D., Papadakis, I. E., Epitropakis, A., Pecháček, T., Dovčiak, M., McHardy, I. M., *A search for X-ray reprocessing echoes in the power spectral density functions of AGN*, Monthly Notices of the Royal Astronomical Society, 2016. **461**(2): p.1642-1655.

20. Epitropakis, A., Papadakis, I. E., Dovčiak, M., Pecháček, T., Emmanoulopoulos, D., Karas, V., McHardy, I. M., *Theoretical modelling of the AGN iron line vs. continuum time-lags in the lamp-post geometry*, *Astronomy & Astrophysics*, 2016, **594**, 71, 17pp.
21. Epitropakis, A., Papadakis, I. E., *Statistical properties of Fourier-based time-lag estimates*, *Astronomy & Astrophysics*, 2016, **591**, 113, 29pp.
22. Fausnaugh, M. M., Denney, K. D., Barth, A. J., Bentz, M. C., Bottorff, M. C., Carini, M. T., Croxall, K. V., De Rosa, G., Goad, M. R., Horne, Keith, Joner, M. D., Kaspi, S., Kim, M., Klimanov, S. A., Kochanek, C. S., Leonard, D. C., Netzer, H., Peterson, B. M., Schnülle, K., Sergeev, S. G., Vestergaard, M., Zheng, W.-K., Zu, Y., Anderson, M. D., Arévalo, P., Bazhaw, C., Borman, G. A., Boroson, T. A., Brandt, W. N., Breeveld, A. A., Brewer, B. J., Cackett, E. M., Crenshaw, D. M., Dalla Bontà, E., De Lorenzo-Cáceres, A., Dietrich, M., Edelson, R., Efimova, N. V., Ely, J., Evans, P. A., Filippenko, A. V., Flatland, K., Gehrels, N., Geier, S., Gelbord, J. M., Gonzalez, L., Gorjian, V., Grier, C. J., Grupe, D., Hall, P. B., Hicks, S., Horenstein, D., Hutchison, T., Im, M., Jensen, J. J., Jones, J., Kaastra, J., Kelly, B. C., Kennea, J. A., Kim, S. C., Korista, K. T., Kriss, G. A., Lee, J. C., Lira, P., MacInnis, F., Manne-Nicholas, E. R., Mathur, S., McHardy, I. M., Montouri, C., Musso, R., Nazarov, S. V., Norris, R. P., Nousek, J. A., Okhmat, D. N., Pancoast, A., Papadakis, I., Parks, J. R., Pei, L., Pogge, R. W., Pott, J.-U., Rafter, S. E., Rix, H.-W., Saylor, D. A., Schimoia, J. S., Siegel, M., Spencer, M., Starkey, D., Sung, H.-I., Teems, K. G., Treu, T., Turner, C. S., Uttley, P., Villforth, C., Weiss, Y., Woo, J.-H., Yan, H., Young, S., *Space Telescope and Optical Reverberation Mapping Project. III. Optical Continuum Emission and Broadband Time Delays in NGC 5548*, *The Astrophysical Journal*, 2016, **821**(1), 56, 25 pp.
23. Fuhrmann, L., Angelakis, E., Zensus, J. A., Nestoras, I., Marchili, N., Pavlidou, V., Karamanavis, V., Ungerechts, H., Krichbaum, T. P., Larsson, S., Lee, S. S., Max-Moerbeck, W., Myserlis, I., Pearson, T. J., Readhead, A. C. S., Richards, J. L., Sievers, A., Sohn, B. W., *The F-GAMMA programme: multi-frequency study of active galactic nuclei in the Fermi era. Programme description and the first 2.5 years of monitoring*, *Astronomy & Astrophysics*, 2016, **597**, 45, 18pp.
24. Giroletti, M., Massaro, F., D'Abrusco, R., Lico, R., Burlon, D., Hurley-Walker, N., Johnston-Hollitt, M., Morgan, J., Pavlidou, V., Bell, M., Bernardi, G., Bhat, R., Bowman, J. D., Briggs, F., Cappallo, R. J., Corey, B. E., Deshpande, A. A., Ewall-Rice, A., Emrich, D., Gaensler, B. M., Goeke, R., Greenhill, L. J., Hazelton, B. J., Hindson, L., Kaplan, D. L., Kasper, J. C., Kratzenberg, E., Feng, L., Jacobs, D., Kudryavtseva, N., Lenc, E., Lonsdale, C. J., Lynch, M. J., McKinley, B., McWhirter, S. R., Mitchell, D. A., Morales, M. F., Morgan, E., Oberoi, D., Offringa, A. R., Ord, S. M., Pindor, B., Prabu, T., Procopio, P., Riding, J., Rogers, A. E. E., Roshi, A., Udaya Shankar, N., Srivani, K. S., Subrahmanyan, R., Tingay, S. J., Waterson, M., Wayth, R. B., Webster, R. L., Whitney, A. R., Williams, A., Williams, C. L., *High-energy sources at low radio frequency: the Murchison Widefield Array view of Fermi blazars*, *Astronomy & Astrophysics*, 2016, **588**, 141, 9 pp.
25. Goad, M. R., Korista, K. T., De Rosa, G., Kriss, G. A., Edelson, R., Barth, A. J., Ferland, G. J., Kochanek, C. S., Netzer, H., Peterson, B. M., Bentz, M. C., Bisogni, S., Crenshaw, D. M., Denney, K. D., Ely, J., Fausnaugh, M. M., Grier, C. J., Gupta, A., Horne, K. D., Kaastra, J., Pancoast, A., Pei, L., Pogge, R. W., Skielboe, A., Starkey, D., Vestergaard, M., Zu, Y., Anderson, M. D., Arévalo, P., Bazhaw, C., Borman, G. A., Boroson, T. A., Bottorff, M. C., Brandt, W. N., Breeveld, A. A., Brewer, B. J., Cackett, E. M., Carini, M. T., Croxall, K. V., Dalla Bontà, E., De Lorenzo-Cáceres, A., Dietrich, M., Efimova, N. V., Evans, P. A.,

- Filippenko, A. V., Flatland, K., Gehrels, N., Geier, S., Gelbord, J. M., Gonzalez, L., Gorjian, V., Grupe, D., Hall, P. B., Hicks, S., Horenstein, D., Hutchison, T., Im, M., Jensen, J. J., Joner, M. D., Jones, J., Kaspi, S., Kelly, B. C., Kennea, J. A., Kim, M., Kim, S. C., Klimanov, S. A., Lee, J. C., Leonard, D. C., Lira, P., MacInnis, F., Manne-Nicholas, E. R., Mathur, S., McHardy, I. M., Montouri, C., Musso, R., Nazarov, S. V., Norris, R. P., Nousek, J. A., Okhmat, D. N., Papadakis, I., Parks, J. R., Pott, J.-U., Rafter, S. E., Rix, H.-W., Saylor, D. A., Schimoia, J. S., Schnülle, K., Sergeev, S. G., Siegel, M., Spencer, M., Sung, H.-I., Teems, K. G., Treu, T., Turner, C. S., Uttley, P., Villforth, C., Weiss, Y., Woo, J.-H., Yan, H., Young, S., Zheng, W.-K., Space Telescope and Optical Reverberation Mapping Project. IV. Anomalous Behavior of the Broad Ultraviolet Emission Lines in NGC 5548, *The Astrophysical Journal*, 2016, **824**(1), 11, 10pp.
- 26.** Gordillo-Vázquez, F. J., Luque, A., Haldoupis, C., *Upper D region chemical kinetic modeling of LORE relaxation times*, *Journal of Geophysical Research: Space Physics*, 2016, **121**(4), p. 3525-3544.
- 27.** Hong, J., Antoniou, V., Zeas, A., Haberl, F., Drake, J. J., Plucinsky, P. P., Gaetz, T., Sasaki, M., Williams, B., Long, K. S., Blair, W. P., Winkler, P. F., Wright, N. J., Laycock, S., Udalski, A., *SXP 214: An X-Ray Pulsar in the Small Magellanic Cloud, Crossing the Circumstellar Disk of the Companion*, *The Astrophysical Journal*, 2016, **826**(1), 4, 8pp.
- 28.** Hovatta, T., Lindfors, E., Blinov, D., Pavlidou, V., Nilsson, K., Kiehlmann, S., Angelakis, E., Fallah Ramazani, V., Liodakis, I., Myserlis, I., Panopoulou, G. V., Pursimo, T., *Optical polarization of high-energy BL Lacertae objects*, *Astronomy & Astrophysics*, 2016, **596**, 78, 24pp.
- 29.** Hung, C.-L., Hayward, C. C., Smith, H. A., Ashby, M. L. N., Lanz, L., Martínez-Galarza, J. R., Sanders, D. B., Zeas, A., *Merger Signatures in the Dynamics of Star-forming Gas*, *The Astrophysical Journal*, 2016, **816**(2), 99, 12 pp.
- 30.** Kiehlmann, S., Savolainen, T., Jorstad, S. G., Sokolovsky, K. V., Schinzel, F. K., Marscher, A. P., Larionov, V. M., Agudo, I., Akitaya, H., Benítez, E., Berdyugin, A., Blinov, D. A., Bochkarev, N. G., Borman, G. A., Burenkov, A. N., Casadio, C., Doroshenko, V. T., Efimova, N. V., Fukazawa, Y., Gómez, J. L., Grishina, T. S., Hagen-Thorn, V. A., Heidt, J., Hiriart, D., Itoh, R., Joshi, M., Kawabata, K. S., Kimeridze, G. N., Kopatskaya, E. N., Korobtsev, I. V., Krajci, T., Kurtanidze, O. M., Kurtanidze, S. O., Larionova, E. G., Larionova, L. V., Lindfors, E., López, J. M., McHardy, I. M., Molina, S. N., Moritani, Y., Morozova, D. A., Nazarov, S. V., Nikolashvili, M. G., Nilsson, K., Pulatova, N. G., Reinthal, R., Sadun, A., Sasada, M., Savchenko, S. S., Sergeev, S. G., Sigua, L. A., Smith, P. S., Sorcia, M., Spiridonova, O. I., Takaki, K., Takalo, L. O., Taylor, B., Troitsky, I. S., Uemura, M., Ugolkova, L. S., Ui, T., Yoshida, M., Zensus, J. A., Zhdanova, V. E., *Polarization angle swings in blazars: The case of 3C 279*, *Astronomy & Astrophysics*, 2016, **590**, 10, 20pp.
- 31.** Larionov, V. M., Villata, M., Raiteri, C. M., Jorstad, S. G., Marscher, A. P., Agudo, I., Smith, P. S., Acosta-Pulido, J. A., arévalo, M. J., Arkharov, A. A., Bachev, R., Blinov, D. A., Borisov, G., Borman, G. A., Bozhilov, V., Bueno, A., Carnerero, M. I., Carosati, D., Casadio, C., Chen, W. P., Clemens, D. P., Di Paola, A., Ehgamberdiev, Sh. A., Gómez, J. L., González-Morales, P. A., Griñón-Marín, A., Grishina, T. S., Hagen-Thorn, V. A., Ibryamov, S., Itoh, R., Joshi, M., Kopatskaya, E. N., Koptelova, E., Lázaro, C., Larionova, E. G., Larionova, L. V., Manilla-Robles, A., Metodieva, Y., Milanova, Yu. V., Mirzaqulov, D. O., Molina, S. N., Morozova, D. A., Nazarov, S. V., Ovcharov, E., Peneva, S., Ros, J. A., Sadun, A. C., Savchenko, S. S., Semkov, E., Sergeev, S. G., Strigachev, A., Troitskaya, Yu. V., Troitsky, I. S., *Exceptional outburst of the blazar CTA 102 in 2012: the*

- GASP-WEBT campaign and its extension*, Monthly Notices of the Royal Astronomical Society, 2016. **461**(3): p.3047-3056.
- 32.**Lehmer, B. D., Basu-Zych, A. R., Mineo, S., Brandt, W. N., Eufrasio, R. T., Fragos, T., Hornschemeier, A. E., Luo, B., Xue, Y. Q., Bauer, F. E., Gilfanov, M., Ranalli, P., Schneider, D. P., Shemmer, O., Tozzi, P., Trump, J. R., Vignali, C., Wang, J.-X., Yukita, M., Zezas, A., *The Evolution of Normal Galaxy X-Ray Emission through Cosmic History: Constraints from the 6 MS Chandra Deep Field-South*, The Astrophysical Journal, 2016, **825**(1), 7, 24pp.
- 33.**Lindfors, E. J., Hovatta, T., Nilsson, K., Reinthal, R., Fallah Ramazani, V., Pavlidou, V., Max-Moerbeck, W., Richards, J., Berdyugin, A., Takalo, L., Sillanpää, A., Readhead, A. C. S., *Optical and radio variability of the northern VHE gamma-ray emitting BL Lacertae objects*, Astronomy & Astrophysics, 2016, **593**, 98, 25pp.
- 34.**Lisenfeld, U., Braine, J., Duc, P. A., Boquien, M., Brinks, E., Bournaud, F., Lelli, F., Charmandaris, V., *Molecular gas and star formation in the tidal dwarf galaxy VCC 2062*, Astronomy & Astrophysics, 2016, **590**, 92, 15pp.
- 35.**Lubiński, P., Beckmann, V., Gibaud, L., Paltani, S., Papadakis, I. E., Ricci, C., Soldi, S., Türler, M., Walter, R., Zdziarski, A. A., *A comprehensive analysis of the hard X-ray spectra of bright Seyfert galaxies*, Monthly Notices of the Royal Astronomical Society, 2016. **458**(3): p.2454-2475.
- 36.**Maccarone, T. J., Yukita, M., Hornschemeier, A., Lehmer, B. D., Antoniou, V., Ptak, A., Wik, D. R., Zezas, A., Boyd, P., Kennea, J., Page, K. L., Eracleous, M., Williams, B. F., Boggs, S. E., Christensen, F. E., Craig, W. W., Hailey, C. J., Harrison, F. A., Stern, D., Zhang, W. W., *Demonstrating the likely neutron star nature of five M31 globular cluster sources with Swift-NuSTAR spectroscopy*, Monthly Notices of the Royal Astronomical Society, 2016. **458**(4): p.3633-3643.
- 37.**Martínez-Galarza, J. R., Smith, H. A., Lanz, L., Hayward, Christopher C., Zezas, A., Rosenthal, L., Weiner, A., Hung, C., Ashby, M. L. N., Groves, B., *Variations of the ISM Compactness Across the Main Sequence of Star Forming Galaxies: Observations and Simulations*, The Astrophysical Journal, 2016, **817**(1), 76, 18 pp.
- 38.**Morozova, D., Larionov, V., Jorstad, S., Marscher, A., Troitskaya, Y., Troitskiy, I., Blinov, D., Borman, G., Gurwell, Mark, *Optical Outburst of the Blazar S4 0954+658 in Early 2015*, Galaxies, 2016, **4**(3), 24, 5pp.
- 39.**Panopoulou, G. V., Psaradaki, I., Tassis, K., *The magnetic field and dust filaments in the Polaris Flare*, Monthly Notices of the Royal Astronomical Society, 2016. **462**(2): p.1517-1529.
- 40.**Papadakis, I. E., Nicastro, F., Panagiotou, C., *Modelling the variable broad-band optical/UV/X-ray spectrum of PG1211+143: implications for the ionized outflow*, Astronomy & Astrophysics, 2016, **591**, 102, 9pp.
- 41.**Papadakis, I., Pecháček, T., Dovčiak, M., Epitropakis, A., Emmanoulopoulos, D., Karas, V., *Signatures of X-ray reverberation in the power spectra of AGN*, Astronomy & Astrophysics, 2016, **588**, 13, 6 pp.
- 42.**Psychogios, A., Charmandaris, V., Diaz-Santos, T., Armus, L., Haan, S., Howell, J., Le Floc'h, E., Petty, S. M., Evans, A. S., *Morphological classification of local luminous infrared galaxies*, Astronomy & Astrophysics, 2016, **591**, 1, 16pp.
- 43.**Reig, P., Kylafis, N. *The origin of the hard X-ray tail in neutron-star X-ray binaries*, Astronomy & Astrophysics, 2016, **591**, 24, 6pp.
- 44.**Reig, P., Nersesian, A., Zezas, A., Gkouvelis, L., Coe, M. J., *Long-term optical variability of high-mass X-ray binaries. II. Spectroscopy*, Astronomy & Astrophysics, 2016, **590**, 122, 31pp.
- 45.**Reig, P., Milonaki, F., *Accretion regimes in the X-ray pulsar 4U 1901+03*, Astronomy & Astrophysics, 2016, **594**, 45, 10pp.

46. Słowikowska, A., Krzeszowski, K., Żejmo, M., Reig, P., Steele, I., *Calibration of the Liverpool Telescope RINGO3 polarimeter*, Monthly Notices of the Royal Astronomical Society, 2016. **458**(1): p. 759-771.
47. Storm, S., Mundy, L. G., Lee, K. I., Fernández-López, M., Looney, L. W., Teuben, P., Arce, H. G., Rosolowsky, E. W., Meisner, A. M., Isella, A., Kauffmann, J., Shirley, Y. L., Kwon, W., Plunkett, A. L., Pound, M. W., Segura-Cox, D. M., Tassis, K., Tobin, J. J., Volgenau, N. H., Crutcher, R. M., Testi, L., *CARMA Large Area Star Formation Survey: Dense Gas in the Young L1451 Region of Perseus*, The Astrophysical Journal, 2016, **830**(2), p.127-155
48. Tritsis, A., Tassis, K., *Striations in molecular clouds: streamers or MHD waves?*, Monthly Notices of the Royal Astronomical Society, 2016. **462**(4): p.3602-3615.
49. Tritsis, A., Tassis, K., Willacy, K., *Chemistry as a diagnostic of prestellar core geometry*, Monthly Notices of the Royal Astronomical Society, 2016. **458**(1): p. 789-801.
50. Troitskiy, I., Morozova, D., Jorstad, S., Larionov, V., Marscher, A., Agudo, I., Blinov, D., Smith, P., Troitskaya, Y., *Multi-Frequency Monitoring of the Flat Spectrum Radio Quasar PKS 1222+216 in 2008-2015*, Galaxies, 2016, **4**(4), 72, 7pp.
51. Troitskaya, Y., Larionov, V., Hagen-Thorn, V., Morozova, D., Blinov, D., Borman, G., Grishina, T., Efimova, N., Kopatskaya, E., Larionova, L., Larionova, E., Troitsky, I., Mokrushina, A., *Multiwavelength Monitoring of the Gamma-Bright Blazar Mkn 421*, Galaxies, 2016, **4**(4), 67, 5pp.
52. Williams, S. J., Bonanos, A. Z., *Spitzer mid-infrared point sources in the fields of nearby galaxies*, Astronomy & Astrophysics, 2016, **587**, 121, 9 pp.
53. Williamson, K., Jorstad, S., Marscher, A., Larionov, V., Agudo, I., Arkharov, A., Blinov, D., Casadio, C., Gómez, J., Hagen-Thorn, V., Joshi, M., Konstantinova, T., Kopatskaya, E., Larionova, E., Larionova, L., Malmrose, M., McHardy, I., Molina, S., Morozova, D., Taylor, B., Troitsky, I., *Correlation Analysis of Delays between Variations of Gamma-Ray and Optical Light Curves of Blazars*, Galaxies, 2016, **4**(4), 64, 9pp.
54. Yukita, M., Hornschemeier, A. E., Lehmer, B. D., Ptak, A., Wik, D. R., Zezas, A., Antoniou, V., Maccarone, T. J., Replicon, V., Tyler, J. B., Venters, T., Argo, M. K., Bechtol, K., Boggs, S., Christensen, F. E., Craig, W. W., Hailey, C., Harrison, F., Krivonos, R., Kuntz, K., Stern, D., Zhang, W. W., *A Hard X-Ray Study of the Normal Star-forming Galaxy M83 with NuSTAR*, The Astrophysical Journal, 2016, **824**(2), 107, 23pp.
55. Zhao, Y., Lu, N., Xu, C. K., Gao, Y., Barcos-Munõz, L., Díaz-Santos, T., Appleton, P., Charmandaris, V., Armus, L., van der Werf, P., Evans, A., Cao, C., Inami, H., Murphy, E., *ALMA Imaging of the CO (6-5) Line Emission in NGC 7130**, The Astrophysical Journal, 2016, **820**(2), 118, 8 pp.
56. Zhao, Y., Lu, N., Xu, C. K., Gao, Y., Lord, S. D., Charmandaris, V., Diaz-Santos, T., Evans, A., Howell, J., Petric, A. O., van der Werf, P. P., Sanders, D. B., *The [NII] 205 μ m Emission in Local Luminous Infrared Galaxies*, The Astrophysical Journal, 2016, **819**(1), 69, 16 pp.

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