

**ACTIVITIES OF THE GROUP FOR  
ASTROPHYSICAL SPECTROSCOPY 2011-2014**

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**Abstract.** Results of activities of the fellows of the Group for Astrophysical Spectroscopy in the period 2011-2014 are reported.

**1. GROUP FOR ASTROPHYSICAL SPECTROSCOPY 2011-2014**

Group for Astrophysical Spectroscopy (GAS) is informal group created in 2002 at Astronomical Observatory in Belgrade but now, members coming to the regular meetings of GAS and taking part in all common activities, are also participants from other institutions from four projects financed by Ministry of Education, Science and Technological Development: 176001 "Astrophysical Spectroscopy of extragalactic objects", 176002 "Influence of collisions with charged particles on astrophysical plasma spectra", 176003 "Gravitation and Structure of Universe on Large Scales" and III 44002 "Astroinformatics: Application of IT in Astronomy and Related Fields of Research". Within the considered period we also participated in FP7 project "Virtual Atomic and Molecular Data Center" - VAMDC the first FP7 project in Serbian Astronomy. GAS members are also involved in the project "Large Synoptical Survey Telescope" a future 8.4 m ground based telescope where the Memorandum of Understanding is prepared. The main observational activities were: - Performed spectroscopical observation (in optical band) with the 6 m telescope Special Astrophysical Observatory (Nizhniy Arkhiz, Russia) Within the 1.01.2011 – 1.07.2014 period fellows of the Group published 75 papers in the international journals on the Science Citation Index list.

Among invited lectures given by the fellows of GAS, particularly important are:

1. Milan S. Dimitrijević, "New Challenges of Astroinformatics - STARK-B Database, Serbian Virtual Observatory - SerVO and Relations to Virtual Atomic and Molecular Data Center - VAMDC" (Key Note Speaker), 12<sup>th</sup> International Conference on Computer Systems and Technologies - CompSysTech11, 16-17 June 2011, Wien, Austria.
2. Dragana Ilić, "Broad Emission Lines: A Tool For Studying Nuclei Of Active Galaxies" (Plenary Lecture), 21<sup>st</sup> International Conference on Spectral Line Shapes, June 30, 2012, St. Petersburg, Russia.

3. Luka Popović: "AGN pairs and supermassive binary BHs: constraints from emission lines", European Week of Astronomy and Space Science EWASS Turku, Special session 6: AGN, galaxy mergers, supermassive black holes and gravitational waves (Invited review Lecture), 8-12 July 2013, Turku, Finland.

4. Dragana Ilić: "Super-massive Black Holes And Spectral Emission Lines" (Plenary Lecture), 22<sup>nd</sup> International Conference on Spectral Line Shapes, 16 June 2014 Tullahoma, United States.

We also have international collaboration with France, Greece, Italy, Russia, Germany, Austria, Tunisia, Spain, USA, Mexico, United Kingdom, Saudi Arabia, Belgium and Bulgaria and within the considered period we had around one hundred visits of foreign scientists and students.

Within the period 2011-2014, within the frame of GAS activity (the activity of the four mentioned projects) 4 PhD theses were defended. Additionally, three Master Theses were defended on 27 July 2012 within the Astromundus European project, with Luka Č. Popović as mentor or co-mentor: 1. Payaswini Saikia: "The UV and Optical Spectral Properties of a Sample of Broad Line AGNs (which obtained from Astromundus the prize as the best Master Thesis); 2. Luca Grassitelli: "Physical Parameters of the Relativistic Shock Waves in a sample of Gamma Ray Bursts; 3. Nemanja Rakić: "Variability of AGN Spectral Properties - Intrinsic Baldwin Effect.

The lists of PhD Theses, monographs, papers published in the journals from Science Citation Index list and conferences organized by GAS is given below.

## 2. DEFENDED PhD THESES

1. M. Stalevski: 2012, "M. Investigating the Structure of Active Galactic Nuclei: The Dusty Torus Faculty of Mathematics", PhD Thesis, University of Ghent and University of Belgrade.

2. Sonja Vidojević: 2012, "Statistics of Langmuir Waves Associated with Type III Solar Radio Bursts", PhD Thesis, Paris.

3. Jelena Kovačević: 2012, "The Relationships Between Spectral Properties of Active Galactic Nuclei Type 1", PhD Thesis, Faculty of Mathematics, University of Belgrade.

4. Aleksandra Nina: 2014, "Diagnostic of Plasma of the Ionospheric D Region with Electromagnetic VLF Waves", PhD Thesis, Faculty of Physics, University of Belgrade.

## 3. MONOGRAPHS

1. Sonja Vidojević: "From an electron beam to the type III solar radio bursts", DISERTACIO, Zadužbina Andrejević, Belgrade, 2014.

## 4. PUBLICATIONS IN INTERNATIONAL JOURNALS FROM SCI LIST 1. 01. 2011-1. 07. 2014

1. L. Č. Popović, A. I. Shapovalova, D. Ilić, A. Kovačević, W. Kollatschny, A. N. Burenkov, V. H. Chavushyan, N. G. Bochkarev, J. Leon-Tavares: "Spectral optical monitoring of 3C 390.3 in 1995-2007: II. Variability of the spectral line parameters", *Astron. Astrophys.* 528 (2011) 13.

2. L. Č. Popović, J. Kovačević: "Optical Emission-line Properties of a Sample of the Broad-line Active Galactic Nuclei: The Baldwin Effect and Eigenvector 1", *Astrophys. J.* 738 (2011) 68.
3. I. Donnarumma, A. De Rosa, V. Vittorini, H. R. Miller, L. Č. Popović, S. Simić, M. Tavani, J. Eggen, J. Maune, E. Kuulkers, E. Striani, S. Vercellone, G. Pucella, F. Verrecchia, C. Pittori, P. Giommi, L. Pacciani, G. Barbiellini, A. Bulgarelli, P. Cattaneo, A. W. Chen, E. Costa, E. Del Monte, Y. Evangelista, M. Feroci, F. Fuschino, F. Gianotti, A. Giuliani, M. Giusti, F. Lazzarotto, F. Longo, F. Lucarelli, A. Pellizzoni, G. Piano, P. Soffitta, M. Trifoglio, A. Trois: "The remarkable Gamma-ray activity in the gravitationally lensed blazar PKS 1830-211", *Astrophys. J. Lett.* 736L (2011) 30.
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5. S. Simić, L. Č. Popović, P. Jovanović: "Influence of Microlensing on Spectral Anomalies of the Lensed Objects", *Baltic Astron.* 20 (2011) 481.
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8. V. Borka Jovanović, I. Radović, D. Borka, Z. L. Mišković: "High-energy plasmon spectroscopy of freestanding multilayer graphene", *Physical Review B* 84 (2011) 155416.
9. I. Radović, D. Borka, Z. L. Mišković: "Wake effect in doped graphene due to moving external charge", *Physics Letters A* 375 (2011) 3720.
10. D. Borka, I. Radović, Z. L. Mišković: "Dynamic polarization of graphene by moving external charges: Comparison with 2D electron gas, *Nuclear Instruments and Methods in Physics Research B* 269 (2011) 1225.
11. V. Borka Jovanović, D. Urošević: "Temperature, brightness and spectral index of the Cygnus radio loop", *Revista Mexicana de Astronomia y Astrofisica* 47 (2011) 159.
12. P. Jovanović, V. Borka Jovanović, D. Borka: "Influence of Black Hole Spin on the Shape of the Fe  $K\alpha$  Spectral Line: the Case of 3C 405", *Baltic Astron.* 20 (2011) 468.
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## 5. CONFERENCES ORGANIZED BY THE GROUP FOR ASTROPHYSICAL SPECTROSCOPY 2011-2014

1. I Workshop on Astrophysical Spectroscopy, Orašac, 26-30 August 2011. SOC Co-chairs M. S. Dimitrijević, L. Č. Popović, LOC Co-chairs M. S. Dimitrijević, A. Kovačević.

2. VIII Serbian Conference on Spectral Line Shapes in Astrophysics, Divčibare, 6-10 June 2011. SOC Co-chairs L. Č. Popović, D. Jevremović, LOC Co-chairs D. Ilić, D. Jevremović.

3. II Workshop on Active Galactic Nuclei and gravitational lensing, Andrijevle (Fruška Gora) 24-28 April 2012. SOC Co-chairs L. Č. Popović, W. Kollatschny, LOC Chair M. Stalevski.

4. Regional Workshop on Atomic and Molecular Data, with introductory tutorial for Virtual Atomic and Molecular Data Center (VAMDC), Belgrade, 14-16 June 2012. SOC Chair M. S. Dimitrijević, LOC Chair A. Kovačević.
5. "Development of astronomy among Serbs VII", Belgrade, 18-22 April 2012. SOC Chair M. S. Dimitrijević, LOC Chair M. Dačić.
6. VIII Serbian - Bulgarian Astronomical Conference, Leskovac, 8-12 May 2012. SOC Co-chairs M. S. Dimitrijević, M. K. Tsvetkov, LOC Co-chairs M. S. Dimitrijević, Ž. Mijajlović.
7. IX Serbian Conference on Spectral Line Shapes in Astrophysics, Banja Koviljača, 13-17 May 2013. SOC Co-chairs L. Č. Popović, M. S. Dimitrijević, LOC Co-chairs Z. Simić, M. Stalevski.
8. II Workshop on Astrophysical Spectroscopy, Vrujci, 9-13. October 2013. SOC Co-chairs M. S. Dimitrijević, Z. Simić, LOC Chair Z. Simić.
9. "Development of astronomy among Serbs VIII", Belgrade, 22-26 April 2014. SOC Chair M. S. Dimitrijević, LOC Co-chairs M. Dačić, M. Jeličić.
10. 9th Bulgarian-Serbian Astronomical Conference "Astroinformatics", July 2-4, 2014, Sofia, Bulgaria. SOC Co-chairs O. Kounchev, D. Jevremović
11. III Workshop on Active Galactic Nuclei and gravitational lensing, Končarevo (Jagodina), 7-11 October 2014. SOC Co-chairs S. Simić, L. Č. Popović, LOC Chair S. Simić