

IVA BOŽIČEVIĆ MIHALIĆ

Curriculum Vitae

PERSONAL INFORMATION

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SCIENTIFIC INTERESTS

Ion Beam Analysis (IBA), Particle Induced X-ray Emission (PIXE), High resolution PIXE (HR PIXE), in-air PIXE, IBA techniques on the ion microprobe, chemical speciation, multivariate analysis of PIXE and PIXE+XRF spectral images, multivariate analysis of spectral images, external ion microprobe

EDUCATION

2009. – 2015. PH.D.

Nuclear Physics, University of Zagreb, Croatia, Dissertation: *High Resolution Spectroscopy of X-rays Emission on Ion Microprobe*

Advisor: dr. sc. Stjepko Fazinić

1999. – 2007. B.SC.

B. Sc., Physics, University of Zagreb, Croatia, Diploma thesis: *Image Reconstruction of Accretion Disc in Double Star TT Hydrae*

Advisor: prof. dr. sc. Krešimir Pavlovski

WORK EXPERIENCE

1.2021. - PRESENT

Laboratory for Ion Beam Interactions, Ruđer Bošković Institute, Zagreb, Croatia

Design and construction of the new HR PIXE spectrometer within Coratian Science Foundation project "Hi-REXS". Study of chemical effects and multiple ionization satellites of characteristic X-ray emission spectra of low Z elements and their compounds with ion excitation. Upgrade of the dual ion microbeam chamber. Development of the external ion microprobe withing the CERIC ERIC project "EXIT". Planning experimental beamlines for the new accelerator facility at RBI within the framework of the capital scientific infrastructure project "O-ZIP".

8.2015. – 12.2020. POSTDOCTORAL RESEARCHER

Laboratory for Ion Beam Interactions, Ruđer Bošković Institute, Zagreb, Croatia

Design and construction of the new HR PIXE spectrometer for Centro Nacional de Aceleradores in Seville, Spain. Use of multivariate analysis techniques in the analysis of PIXE and PIXE+XRF spectral images. Micro-analysis of dust particles from JET tokamak.

12.2017.-12.2018. POSTDOCTORAL RESEARCHER

X-ray Fluorescence beamline (XRF), Elettra Sincrotrone Trieste, Trieste, Italy

Micro-XRF mapping of sediment samples from Crevice cave (South Africa) – identification of layers with high levels of S. Chemical speciation of S in Raša coal and polluted soil from Plomin coal plant with XANES.

1.2008.-7.2015. PH.D. STUDENT

Laboratory for Ion Beam Interactions, Ruđer Bošković Institute, Zagreb, Croatia

Construction of the downsized wavelength dispersive spectrometer for HR PIXE spectroscopy. Study of chemical effects in characteristic $K\alpha$ and $K\beta$ X-ray emission spectra of Si, S and its compounds with ion excitation.

SCHOOLS AND WORKSHOPS

- XLII Zakopane School of Physics, Breaking Frontiers: Submicron Structures in Physics and Biology, Zakopane, Poland, 19.-24.5.2008.
- Adriatic School on Nanoscience: From Atomic to Macroscopic Nanostructures, Dubrovnik, Croatia, 20.9.-23.9.2010., poster
- Workshop within FP7 project “New detector technologies for advanced materials research using ion beam analysis”, Plitvice lakes, Croatia, 24.10.-27.10.2010., talk
- Training in Laboratory for Characterization and Speciation of Aerosols, Instituto Tecnológico e Nuclear, Lisbon, Portugal within CRO/8/008 project: „Upgrading Nuclear Analysis Techniques for Air Pollution Monitoring“, 17.11.-16.12.2010.
- SPIRIT JRA meeting, Bled, Slovenia, 2013., talk
- IAEA Training Workshop on Advances in Ion Beam Techniques and their Applications, Zagreb, Croatia, 2021., virtual, talk + exercise
- HERCULES Specialized Course 2021, Trieste, Italy, virtual, talk
- First CIBA International Workshop on MeV Light Ions for Radiobiology (IMIRA), Singapore 2025.

CONFERENCES

- European Conference on X-ray Spectrometry, Cavtat, Croatia, 2008.
- Ion Beam Analysis, Cambridge, United Kingdom, 2009., poster
- 12th International Conference on Nuclear Microprobe Technology and Application, Leipzig, Germany, 2010., poster
- 11th European Conference on Accelerators in Applied Research and Technology, Namur, Belgium, 2013., poster
- 8th international meeting of Hrvatsko fizikalno društvo, Primošten, Hrvatska, 2013., poster
- European Conference on X-Ray Spectrometry, Bologna, Italy, 2014., talk
- Ion Beam Analysis, Opatija, Croatia, 2015., talk
- 15th International Conference on Particle Induced X-ray Emission, Split, Croatia, 2017., talk
- 24th International Scientific Meeting on Vacuum Science and Technique, Njivice, Croatia, 2019., invited talk
- 13th European Conference on Accelerators in Applied Research and Technology, Split, Croatia, 2019.
- IBA/PIXE & SIMS, virtual, 2021, talk
- European Conference on X-ray Spectrometry 2022, Bruges, Belgium, 2022, talk
- 18th International Conference on Nuclear Microprobe technology and applications, Ljubljana, Slovenia, 2022, talk
- 26th International Conference on Ion Beam Analysis and 18th International Conference on Particle Induced X-ray Emission, Toyama, Japan, 2023, invited talk
- European Conference on X-ray Spectrometry 2024, Athens, Greece, 2024, talk

PROJECTS

- 2008.–2013. Croatian ministry of science, education and sport, project No. 098-1191005-2876: “Ion beam interaction and nanostructures”, participant
- 2009.–2013. EU FP7: SPIRIT – Support of Public and Industrial Research using Ion beam Technology; WP 7: Chemical effects, participant
- 2009.-2013. IAEA CRP: Upgrade of PIXE and STIM Imaging capabilities at Zagreb nuclear microprobe, participant
- 2014.-2018. Croatian Science Foundation, project No: 8127, Ion Beam Induced Changes in Crystalline Materials (MIOBICC), participant
- 2015.-2016. Bilateral project with Germany (MZOS-DAAD), Technische Universitat Berlin, Micro X-ray Emission Spectroscopy (MIXES), participant
- 2015.-2020. Horizon2020 ERA Chair: Expanding Potential in Particle and Radiation Detectors, Sensors and Electronics in Croatia (PaRaDeSEC), participant
- 2016.-2018. Croatian Science Foundation, project No. 1698, Development of the capillary microprobe for MeV SIMS with application on analysis of biological samples, participant
- 2018.-2022. Croatian Science Foundation, project No. 2786, Defects dynamics in NanoMaterials: research based on Ion Track Experiments (DyNaMITE++), participant
- 2019.-2023. RADIATE Research and development with ion beams – advancing technology in Europe, participant
- 2020.-2023. Croatian Science Foundation, project No. 9429, High resolution X-ray spectrometry with focused ion beams (Hi-REXS), participant
- 2020.-2023. National Science Foundation, Collaborative Research: P2C2--South African Hydroclimate Reconstructions Using Speleothem Multiproxy Analyses, participant
- 2021.–2025. Horizon 2020, AIDAInnova Advancement and Innovation for Detectors at Accelerators, participant
- 2022.- 2026. Horizon EU, EUROpean Laboratories for Accelerator Based Sciences EURO-LABS, participant
- 2024.-2027. Scientific Centers of Excellence, Center of Excellence for Advanced Materials and Sensors (CEMS): Materials for Clean Energy, Advanced Sensors and Quantum Technologies, participant
- 2024.- 2026. CERIC ERIC: Beam line for the External Ion microbeam Techniques (EXIT), principal investigator
- 2026.-2030. Croatian Science Foundation: Multipurpose external ion microprobe for irradiation and analysis (MEXIA), principal investigator

MEMBER OF THE ORGANIZING COMMITTEE

- European Conference on X-ray Spectrometry, Cavtat, Croatia, 2008.
- International workshop within FP7 project SPIRIT, Plitvice lakes, Croatia, 2010.
- 22nd International Conference on Ion Beam Analysis, Opatija, Croatia, 2015.
- 13th European Conference on Accelerators in Applied Research and Technology, Split, Croatia, 2019.
- IAEA - Training Workshop on Advances in Ion Beam Techniques and their Applications, virtual, Zagreb, 2021
- IAEA - Training Workshop on Advances in Ion Beam Techniques and their Applications, virtual, Zagreb, 2022
- Young Scientist Festival of the Division of Experimental Physics, RBI, Zagreb, Croatia, 2023., 2024. and 2025.

OTHER SCIENTIFIC ACTIVITIES

REVIEWER:

Journal of Analytical Atomic Spectrometry

Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atom

X-Ray Spectrometry

Measurement

MEMBERSHIP IN PROFESSIONAL ASSOCIATIONS:

International Radiation Physics Society

EDITORIAL ADVISORY BOARD:

X-Ray Spectrometry

COMPUTER SKILLS:

Programming languages: Matlab

Analysis tools: PyMca, Orange, Origin

3D modeling: Solidworks

OS: Microsoft Windows

POPULARIZATION OF SCIENCE

Participation in Ruđer Bošković Institute Open Days