

PERSONAL INFORMATION

Bogdan-Vasile MIHALCEA



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Sex Male | Date of birth 01/01/1965 | Nationality Romanian

POSITION APPLIED FOR

ESA Space Science Advisory Group (SSAG)

WORK EXPERIENCE

05. 2019 -
07.1996 – 04. 2019

Senior research scientist rank 2
Senior research scientist rank 3

National Inst. for Laser, Plasma and Radiation Physics (INFLPR), 077125 Măgurele, Romania

05. 2025 -

▪ Romanian National Delegate in the Prodex Programme Board

12.2023 – 12. 2024

▪ Consultant for review for ISS capabilities - Facility Definition Team "Atomic Clock", Directorate of Human and Robotic Exploration Programmes, European Space Research and Technology Centre (ESTEC)

01. 2023 – 06. 2025

▪ Expert evaluator QuantERA, EURAMET, EC, COST → Atomic, Optical and Molecular Physics; Atomic clocks; Quantum Technologies → quantum metrology and sensing, quantum communications; Time and Frequency Transfer (TFT)

▪ Project Manager INFLPR, Romanian National Quantum Communications Infrastructure (RoNaQCI), EC Project ID: **101091562**. UEFISCDI ID: **EUD19/2024**.

05. 2020 -

▪ Science Team Member in the ESA Candidate Mission International Space Station-Space Optical Clock-Pathfinder (I-SOC-PF)

09.2018 – 03. 2023

▪ Management Committee (MC) Member in the COST Action **CA 17113 Trapped Ions: Progress in Classical and Quantum Applications** ([TIPICQA](#))

09. 2017 – 09.2020

▪ Technical Manager ESA Contract No. **4000121912/17/NL/CBi Laser Plasma Accelerators as tools for Radiation Hardness Assessment (RHA) Studies and Tests in support of ESA space missions**

07. 2017 – 07. 2019

▪ Project Manager Contract **136/2017** Romanian Space Agency (ROSA) Title: *Development of quadrupole and multipole ion trap based mass spectrometers for optical characterization and chemical analysis of atmospheric aerosol particles*

06. 2014 – 07. 2017

▪ Technical Manager ESA Contract No. **4000111242/14/NL/CBi Feasibility Study for the Use of the Cetal Infrastructure**

12. 2010 – 12. 2014

▪ MC member COST Action MP1001 *Ion Traps for Tomorrow Applications*

Business or sector Research & Innovation

EDUCATION AND TRAINING

10. 2011 – 11.2011

Short Term Scientific Mission (STSM)

Optical Clocks and Complex Systems Group, PTB Braunschweig

▪ *Sympathetic Cooling of Coulomb Crystals for Optical Clocks*

02. 1993 – 12.1997

PhD in Plasma Physics

Institute of Atomic Physics (IPA), 077125 Măgurele, Romania

- *PhD Thesis: Phase transitions for systems of ultracold trapped ions* (12. 1997)

09. 1984 – 06.1989

Master of Science (M.Sc.) in Physics Engineering

Faculty of Physics, Univ. of Bucharest – specialized in Measurement and Control Devices

- *M.Sc. Thesis: Electronic system for thermal control of an active Hydrogen maser* (06. 1989)

PERSONAL SKILLS

Mother tongue(s)

Romanian

Other language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C2	C2
French	C1	C1	C1	C1	C1
Italian	B2	C2	B2	B2	B2
German	B1	C1	B1	B1	B1

Levels: A1/2: Basic user - B1/2: Independent user - C1/2 Proficient user
Common European Framework of Reference for Languages

Communication skills

- Ability to have comprehensive conversations in multiple foreign languages
- very good communication skills developed along 30 years of career in science and teaching

Organisational / managerial skills

- leadership → Manager in many international and national contracts, with teams of up to 25 – 30 people
- initiative → responsible for initiating international and national partnerships in physics (ion traps, quantum technologies, plasma physics, photonics)
- creativity → able to write international partnerships either as coordinator or partner
- positive attitude → open, good communicator, able to motivate members of a team
- able to work in a team, either as a leader or as a team member

Job-related skills

- Very good command of ion traps, atomic clocks, quantum optics, quantum sensing and generally quantum technologies based on ultracold trapped ions (particles)
- good command of analogue and digital electronics

Computer skills

- Excellent command of LaTeX professional editing (TeXstudio, Kile, etc)
- Advanced user of UNIX (FreeBSD, NetBSD) and Linux (Ubuntu, Debian, RHEL, Arch Linux)
- Advanced user of text processing suites such as LibreOffice, Microsoft Office
- Good command of Python, PHP, HTML5

Other skills

- Good command of universal history and geography

Driving licence

- B

ADDITIONAL INFORMATION

Publications
Presentations
Projects
Conferences
Seminars
Honours and awards
Memberships
References

Over 35 peer-reviewed papers published in physics journals and over 80 papers presented at peer-reviewed international conferences. Over 280 citations. Most recent papers:

- B. Mihalcea, *Contributions to the study of time dependent oscillators in Paul traps. Semiclassical approach*, Rom. J. Phys. **69** (9-10) 205 (2024); <https://doi.org/10.59277/RomJPhys.2024.69.205>
- M. I. Mihăilescu, V. Mărăscu, B. M. Mihalcea, *Build of a Free Space Optical (FSO) Quantum Key Distribution (QKD) Link*, ICAMCS 2024 International Conference on Applied Mathematics & Computer Science, Venice, Italy, September 28-30, 2024; <https://doi.org/10.1109/ICAMCS62774.2024.00033>
- B. Mihalcea, *Solutions of the Mathieu-Hill Equation for the Trapped Ion Harmonic Oscillator --- A Qualitative Discussion*, Mathematics **12** (19) 2963 (2024); <https://doi.org/10.3390/math12192963>
- B. Mihalcea, *Mathieu-Hill Equation Stability analysis for Trapped Ions: Anharmonic Corrections for Nonlinear Electrodynamic Traps*, Photonics **11** (6) 551 (2024); <https://doi.org/10.3390/photonics11060551>
- B. Mihalcea et al, *The physics and applications of strongly coupled Coulomb systems (plasmas) levitated in electrodynamic traps*, Phys. Rep. **1016**, p. 1-103 (2023); <https://doi.org/10.1016/j.physrep.2023.03.004>
- B. Mihalcea, *Coherent states for trapped ions. Applications in quantum optics and precision measurements*, Proc. of 9th Meeting on CPT and Lorentz Symmetry (CPT'22), Editor R. Lehnert, World Scientific (2023) https://doi.org/10.1142/9789811275388_0043
- B. Mihalcea, *Quasienergy operators and general squeezed states for systems of trapped ions*, Ann. Phys. (NY) **442** 169826 (2022); <https://doi.org/10.1016/j.aop.2022.169826>
- B. M. Mihalcea, S. Lynch, *Investigations on dynamical stability in 3D quadrupole ion traps (QIT)*, Appl. Sci. **11** (7) 2938 (2021); <https://doi.org/10.3390/app11072938>
- B. Mihalcea, *Squeezed Coherent States of Motion for Ions Confined in Quadrupole and Octupole Ion Traps*, Ann. Phys. (NY) **388**, p. 100 - 113 (2018); <https://doi.org/10.1016/j.aop.2017.11.004>
- 11 invited papers, 1 invited lesson Institute for Space Science (ISS) Talks, *Quantum engineering of space and time using ion traps. Optical atomic clocks.* https://www.youtube.com/watch?v=CKzEKlq_oDg
- Editorial Board member *Time and Space* 12.2023 -
- Review Editor for *Frontiers in Physics* since 09. 2023
- Associate Editor Photonics, Guest Editor Photonics --> Special issue: *Advances in Quantum Technologies Based on Trapped Charged Particles* (2024);
- Reviewer for 20 physics journals, amongst which Eur. Phys. J. Plus, J. Am. Soc. Mass Spectrom., J. Appl. Phys., J. Plasma Phys., New J. Phys., Phys. Scr., Powder Technol., Quant. Sci. Technol., Rep. Progr. Phys.
- IOP Truster Reviewer Award 2024
- IOP Outstanding Reviewer Award 2018 (J. Phys. B) and 2019 (Physica Scripta)
- ORCID <https://orcid.org/0000-0001-7880-8331>
- Researcher ID: **E-9934-2011**
- **Google Scholar** <https://scholar.google.com/citations?user=KqG5qVUAAAAJ&hl=en>
- Scopus ID: **6507672532**