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Ioana Marica (cas. Cârdan)

WORK EXPERIENCE

Babeș-Bolyai University – Cluj-Napoca, Romania

Scientific Research Assistant (ACS)

[07/2025 – Current]

ACS in the research project entitled: *Implications of Nano/Microplastic Pollution on AquatiC Environment HealTh (IMPACT)*

National Institute for Research and Development of Isotopic and Molecular Technologies – Cluj-Napoca, Romania

Early Stage Researcher (R1)

[12/2025 – Current]

Department: Isotopic and Molecular Technologies
Research Team: NanoPhotonix

Scientific Research Assistant (ACS)

[03/2021 – 12/2025]

Department: Isotopic and Molecular Technologies
Research Team: NanoPhotonix

Babeș-Bolyai University – Cluj-Napoca, Romania

Tutor for undergraduate students

[16/11/2020 – 30/06/2021]

ROSE Project, Faculty of Physics, Babeș-Bolyai University

EDUCATION AND TRAINING

PhD student

Doctoral School of Physics, Babeș-Bolyai University [01/10/2022 – Current]

Thesis: Detection of nanoplastics by using ultrasensitive Raman-based methods, Supervisor: Prof.dr.habil. Simona C. Pînzaru

MSc in Physics

Faculty of Physics, Babeș-Bolyai University [28/09/2020 – 03/07/2022]

Field(s) of study: Biophysics and Medical Physics | **Thesis:** A Raman spectral database of naturally aged plastics: a proof-of-concept study for plastic waste sorting, Supervisor: Prof.dr.habil. Simona C. Pînzaru

Engineer

Faculty of Physics, Babeș-Bolyai University [10/2016 – 06/2020]

Field(s) of study: Technological Physics | **Thesis:** Study of Raman signal variability of plastic waste for an efficient sorting technique based on Raman spectroscopy, Supervisor: Prof.dr.habil. Simona C. Pînzaru

SCIENTIFIC INTEREST

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- Surface-enhanced Raman Scattering (SERS) studies on nanoplastics detection and their tracing in the environment.
- Micro- and macroplastics detection and sorting using micro-Raman spectroscopy technique.
- Fabrication of nanostructured plasmonic substrates by means of colloidal lithography and their optimization for improved SERS substrates

SCIENTIFIC OUTPUT

Publications

15 publications indexed Web of Science

Citations: 173; Hirsch Index: 8 - **Web of Science**

https://www.webofscience.com/wos/author/record/KCJ-8441-2024

Citations: 228; Hirsch Index: 8 - **Google Scholar**

https://scholar.google.com/citations?user=gLI9F8IAAAAJ&hl=en&authuser=1

Patents

Cârdan Ioana, Farcău Cosmin-Adrian, "A method based on colloidal lithography for obtaining SERS substrate consisting of quasi-three-dimensional plasmonic nanostructures"; *Patent application no. A/00291. 09.07.2025*

RESEARCH STAGES

[05/03/2023 – 02/05/2023]
Department of Chemical Sciences, University of Padova, Padova, Italy

Short Term Scientific Mission (STSM) grant supported by COST Action CA20101, PRIORITY

Project: Surface-enhanced Raman Spectroscopy of nanoplastics on nanostructured plasmonic substrates

(dr. R. Signorini and dr. R. Pilot)

RESEARCH GRANTS AND SCHOLARSHIPS

[11/2024 – 10/2025]
Research Scholarship for Scientific Contributions

Funded by Babeș-Bolyai University within *Premiere PROGRESS* institutional project, project number PN-IV-P8-8.1-PRE-HE-ORG-2023-0118

Cluj-Napoca, Romania

[01/01/2023 – 30/06/2023]
Doctoral Advanced Fellowship

Funded by Babeș-Bolyai University – Project no. PFE-550-UBB

Project: From macro and micro to nanoplastics identification and monitoring in environmental biota: strategies to enhance micro-Raman signal from biological samples exposed to nanoplastics

Cluj-Napoca, Romania

[2021 – 2022]
Research scholarship

Funded by the World Federation of Scientists

Project: Sorting environmental plastics for recycling using Raman spectroscopy with portable instruments

Cluj-Napoca, Romania

[28/09/2020 – 30/09/2021]
Research scholarship

Funded by Babeș-Bolyai University

Project: Study of the natural plastic degradation to streamline a sorting technique based on Raman technology in order to recycle and apply data according to the FAIR principle

Cluj-Napoca, Romania

CONFERENCES AND SEMINARS

[03/02/2026 – 05/02/2026] Ljubljana, Slovenia
Microplastic Days 2026 Conference Poster: I. Cârdan, I.Nesterovschi, A. Couți, S. Ducoli, S. Federici, S. Cîntă Pînzaru, and C. Farcău, "SERS detection of environmental nanoplastics by using customized plasmonic nanostructured substrates"

[02/09/2025 – 05/09/2025] Leoben, Austria
Final Conference of the Cost Action PRIORITY Poster: I. Cardan, S. Cîntă Pînzaru, L. Barbu-Tudoran and C. Farcău, "Resonance Raman-assisted SERS detection ofblue nanoplastics: blue pigment as an analytical marker"

[23/06/2025 – 27/06/2025] Munich, Germany
SPIE Optical Metrology - Multimodal Sensing and Artificial Intelligence for Sustainable Future Oral presentation: I. Cardan, S. Cîntă Pînzaru, L. Barbu-Tudoran and C. Farcău, "Detection of blue nanoplastics usingresonance Raman spectroscopy coupled with plasmonic nanostructured substrates"

[27/07/2024 – 02/08/2024] Rome, Italy
28th International Conference on Raman Spectroscopy – ICORS 2024 Oral presentation: I. Marica, I. Nesterovschi, C. Farcău, S. Cîntă Pînzaru. "Blue, naturally degraded nanoplastics abundance and their detection via two Raman-based approaches"

[19/09/2023 – 22/09/2023] Cluj-Napoca, Romania
International Conference on Processes in Isotopes and Molecules (PIM 2023), Poster: I. Marica, A M M Gherman, A Colnita, V Zani, R Signorini, R Pilot, and C Farcau, “Plasmonic nanostructured substrates fabricated by colloidal lithography for nanoplastics SERS detection”

[27/08/2023 – 01/09/2023] Krakow, Poland
International Conference on Advanced Vibrational Spectroscopy (ICAVS12) Poster: I. Marica, V. Zani, R. Signorini, R. Pilot, S. Cîntă Pinzaru, C. Farcău, “Optical properties and SERS analysis of quasi-3D plasmonic nanostructures fabricated by colloidal lithography”

[10/07/2023 – 14/07/2023] Athens, Greece
14th International Conference on Surfaces, Coatings and Nanostructured Materials (NANOSMAT) Poster: I. Marica, M. Stefan, S. Boca, A. Falamaş, C. Fracau, "Evaporation induced self-assembly of ZnO and TiO 2 colloidal nanoparticles into highly uniform films for spectroscopic applications"

[08/09/2022 – 15/09/2022] Dubrovnik, Croatia
International Conference on Physics of Advanced Materials (ICPAM-14) Poster: I Marica, I Nesterovschi and S Cîntă Pînzaru "A sustainable plastic waste initiative from macro- to microplastics based on Raman spectroscopy technique"

[22/09/2021 – 24/09/2022] Cluj-Napoca, Romania
International Conference “Processes in Isotopes and Molecules" (PIM 2021) Poster: I. Marica, I. Nesterovschi, M. Aluaș, S. Cîntă Pînzaru, "Environmental degradation and pigments influence on plastics waste determined by Raman Spectroscopy: sorting algorithm and plastic Raman database".

[23/09/2021 – 24/09/2021] Cluj-Napoca, Romania
International Conference “Life sciences for sustainable development" Poster: I. Marica, M. Aluaș and S. Cîntă Pînzaru, "Sorting of mixed plastic waste using the Raman spectroscopy technique as a sustainable solution".

[21/11/2019 – 23/11/2020] Iași, Romania
International Conference on E-Health and Bioengineering (EHB) Oral presentation: I. Marica, M. Aluaș and S. C. Pînzaru, "The Management and Stewardship of Medical Plastic Waste using RamanSpectroscopy to Sustain Circular Economy.

WORKSHOPS AND COURSES

[07/06/2026 – 12/06/2026]
Blended Intensive Program (BIP) Erasmus+ - NANO-HANDS

Bologna, Italy

Hands-on with the Nano-world: Atomic Force Microscopy in Practice

[05/02/2026 – 05/02/2026]
Workshop for Young Researchers - Measurement uncertainties in microplastic laboratory research: Towards reliable and comparable results

Ljubljana, Slovenia

The Workshop was organized within the Microplastic Days 2026 Conference and with the support of the COST Action ICPLASTIC.

[16/06/2025 – 20/06/2025]
Geneva Summer School on Microplastics

Geneva, Switzerland

[08/09/2024 – 13/09/2024]
Microplastics workshop for early career researchers: Best practices and expert insights

Idstein, Germany

Oral presentation and poster: I. Marica, I. Nesterovschi, C. Farcău, S. Cîntă Pînzaru

The abundance of blue micro- and nanoplastics in the environment and their detection via micro-Raman and SERS methods

[28/07/2024 – 02/08/2024]
CHARISMA Raman School

Rome, Italy

[06/06/2022 – 09/06/2022]
Ciamician Photochemistry School

Bologna, Italy

Organized by the University of Bologna, Italy

[22/05/2022 – 25/05/2022]
International Workshop "Women in Photonics"

Jena, Germany

Oral presentation and Poster: I. Marica, M. Aluaș and S. Cîntă Pînzaru "Prospects to up-scale Raman technology for pigmented and environmentally degraded plastic waste: sorting algorithm and plastic Raman database".

[08/11/2021 – 11/11/2021]
18th International Course on "Principles and Applications of Time-Resolved Fluorescence Spectroscopy"

Virtual Meeting

The course was organized by PicoQuant and held in cooperation with Prof. J.R. Lakowicz.

[05/07/2021 – 09/07/2021]
EUGLOH summer school - Lasers in Medicine and Life Sciences (LAMELIS)

Virtual Meeting

Organised by the University of Szeged | Hungary

[24/06/2021 – 24/06/2021]

International Workshop "Blue bioeconomy approach to wasted marine biomass: innovative ideas, techniques and translational sciences"

RDI Institute of Applied Natural Sciences – Babeș-Bolyai University, Cluj-Napoca, Romania

Presented Paper: I. Marica & I. Nesterovschi, "From macro- to microplastics identification and sorting using Raman technology"

Event organized by RDI Laboratory of applied Raman spectroscopy and services towards the society, within the RDI Institute of Applied Natural Sciences – Babeș-Bolyai University, and the "Ioan Ursu" Institute of the Faculty of Physics and with participation of the company METROHM Romania & BWTEK.

TEACHING ACTIVITIES

Spectroscopy and Lasers laboratory

Faculty of Physics, Babeș-Bolyai University, 1st semester of the last three academic years (2022-2025) - bachelor level

Biomedical applications of IR and Raman Spectroscopy laboratory

Faculty of Physics, Babeș-Bolyai University, 2nd semester of 2023-2024 - master level

HONOURS AND AWARDS

[06/03/2025]
First Prize in the Regional Student Science Poster Competition - "Emerging Technology-Based Solutions for Sustainable Development" The competition was organized by the Faculty of Engineering in Foreign Languages (FILS) and the Directorate of International Relations (DRI) of the National University of Science and Technology POLITEHNICA Bucharest, with the support of the University Agency of Francophonie – Central and Eastern Europe (ECO)

[14/11/2024]
Danubius Young Scientist Award 2024 Awarding institution: The Austrian Federal Ministry of Education, Science and Research in cooperation with the Institute for the Danube Region and Central Europe

[22/09/2023]
The Best Poster Award Awarding institution: INCDTIM, International Conference on Processes in Isotopes and Molecules (PIM 2023)The awarded poster: "Plasmonic nanostructured substrates fabricated by colloidal lithography for nanoplastics SERS detection"

[15/09/2022]
The Best Poster Presentation Award Awarding institution: University of Dubrovnik, International Conference on Physics of Advanced Materials (ICPAM-14)The awarded paper "A sustainable plastic waste initiative from macro- to microplastics based on Raman spectroscopy technique"

[23/06/2021]
Excellentia Award - Bachelor level Awarding institution: Student council from Babeș-Bolyai University

PUBLIC ENGAGEMENT/OUTREACH

[2022]
Romanian TV report "Romania la PET" within "Romania, Te Iubesc" TV show

https://www.youtube.com/watch?v=DYb3MtMRwMk

06/08/2026



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