

Curriculum Vitae

PERSONAL INFO

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SCIENTIFIC INTEREST

- Nanofabrication, self-assembly of nano- and micro-particles
- Optical properties of plasmonic nanostructures
- Plasmon-enhanced molecular optical processes (fluorescence, Raman)
- Optical/electrical sensing based on plasmonic nanostructures

CAREER TRACK

- 2022 - **Team Leader** of the *Laser-Induced Processes* team at National Institute for Research and Development of Isotopic and Molecular Technologies (INCDTIM), Cluj-Napoca, Romania.
- 2017 - **Scientific Researcher I**, INCNTIM, Cluj-Napoca, Romania.
- 2014 - **Scientific Researcher II (I from 2016)**, Interdisciplinary Research Institute in Bio-Nano-Sciences (IRIBNS), Babeş-Bolyai University.
- 2012 - 2014 **Scientific Researcher III**, IRIBNS, Babeş-Bolyai University.
- 2009 - 2011 **Postdoctoral researcher** at LPCNO (Laboratoire de Physique et Chimie de Nano-Objets) UMR 5215 CNRS-INSa-UPS, Toulouse, France; supervisor prof. L. Ressler. (*convective self-assembly of nanoparticles for strain sensors*).
- 2008 - 2009 **Postdoctoral researcher** at CEMES (Centre d'Elaboration de Matériaux et d'Etudes Structurales) UPR 8011 CNRS, Toulouse, France; supervisor prof. R. Carles. (*optical and vibrational properties of glass-embedded Ag nanocrystals*)

STUDIES

- 2005 - 2008 **Doctorate in Physics**, Faculty of Physics, Babeş-Bolyai University, Cluj-Napoca, Romania. (*Ordered Plasmonic Nanostructures: from Fabrication to Relevant Applications in Optical Spectroscopy and Sensing*)
- 2004 – 2005 **Master in Physics**, Faculty of Physics, Babeş-Bolyai University, Cluj-Napoca, Romania.
- 2000 – 2004 **Licence in Physics**, Faculty of Physics, Babeş-Bolyai University, Cluj-Napoca, Romania.

RESEARCH STAGES

- Centre de Recherche Paul Pascal, CNRS (dr. R.A.L. Vallee), Bordeaux -Pessac, July 2016, research stage in the frame of a Ro-Fr collaboration project *Brancusi*.
- Institut für Physikalische Chemie (prof. J. Popp), Friedrich Schiller University, Jena, Germany, November 2007. (*SERS and SNOM studies*)
- Laboratoire de Spectrometrie Physique (dr. P. Baldeck), Joseph-Fourier University, Grenoble, France, MIRA Fellowship (*Mobilite Internationale Rhone-Alpes*), March - May 2007. (laser fabrication of metallic *microwires*)
- Institut für Physikalische Chemie (prof. W. Kiefer), Julius Maximilian University, Wuerzburg, Germany, Socrates Scholarship, April - August 2005. (*SERS studies*)

RESEARCH PROJECTS COORDINATED

- PN-III-P4-ID-PCE-2020-1607, *Active tuning of plasmon resonances in gold nanoparticle arrays on elastomeric substrates for ultrasensitive dual MEF/SERS biosensing*, 1.199.330 lei, 2022-2024.
- RO-NO-2019-0517, *Nanostructured microfluidic analytical platform for dual SERS-electrochemical detection of emerging environmental pollutants*, 1.177.343 EUR, 2020-2023. <https://www.itim-cj.ro/polsens/>
- PN-III-P2-2.1-PED-2019-5473, *Nanostructured plasmonic platform for dual electrochemical/SERS detection of environmentally persistent pharmaceutical pollutants*, 600.000 lei, 2020-2022. <https://www.itim-cj.ro/PNCID/pharmexer/>
- Romania - JINR Dubna cooperation project, *Surface Enhanced Coherent Anti-Stokes Raman Scattering (SECARS) on Hybrid Colloidal Photonic-Plasmonic Crystals*, 2019-2021.
- PN-II-RU-TE-2011-4-2369 *Nano-Gap Arrays Fabricated on Large Areas as Plasmonic Platforms for Controlling Light Emission Processes*, 544.371 lei, 2015-2017. <https://sites.google.com/site/glanceprojectubb/home>
- UBB Advanced Fellowships Grant, financed through national competition by STAR-UBB, Universitatea Babeș-Bolyai, 2017-2018.
- PN-II-CT-RO-FR-2014-2-0052 *Spectrally selective enhancement and directionality of spontaneous emission in anisotropic plasmo-photonic nanostructures*, bilateral cooperation project Romania-France, 21600 lei, 2015-2016.
- PN-II-RU-TE-2011-3-0134 *Development of Dual Electrical/Optical NanoSensors on Flexible Substrates by Colloidal Self-Assembly*, 900000 lei, 2011-2014. <https://sites.google.com/site/farcaucosmin/research/deonos-project>
- Grant for Young Researchers (GTC), Babeș-Bolyai University, 4.526 EUR, 2013.
- Scientific Research Scholarship for doctoral students BD, *Nanostructuri metalo-polimerice cu aplicatii in spectroscopia optica de inalta sensibilitate si nanofotonica*, CNCSIS, 2.707 EUR, 2006-2008.
- CNCSIS TD 261/2007 *Preparation, characterisation and testing of periodic metallic nanostructures on solid substrate for applications in nanophotonics, bio-plasmonics and Raman scattering based molecular detection*.

SCIENTIFIC OUTPUT AND IMPACT

- **publications: 80:** 69 articles in journals with IF, 1 book, 2 book chapters;
- **citations >1560; h-index = 21** (WoS);

- **guest editor** of Special Issue on *Nanoscale Optical Sensing*, Nanomaterials journal, 2018-2019;
- **member of the Topic Board**, Nanomaterials journal, 2020-2021.
- **oral / invited conferences**
 - *11th International Conference of the Balkan Physical Union*, Belgrade, 28 Aug - 1 Sep 2022.
 - *Processes in Isotopes and Molecules*, Cluj-Napoca 2019.
 - *EMN Meeting on Photonics*, Budapest, 4-8 Sep 2017.
 - *EUCMOS 2012 – 31st European Congress on Molecular Spectroscopy*, Cluj-Napoca, 26-31 Aug 2012.
 - *ROMOPTO 2006: Eighth Conference on Optics*, Sibiu, 4-7 Sep 2006.

TEACHING ACTIVITIES

- *Optics laboratory*, Faculty of Physics, Babeş-Bolyai University, 1st Semester of 2014-2015.
- *Optotechnics and Optometry* course, Faculty of Physics, Babeş-Bolyai University, 2nd Semester of 2014-2015.
- Member in the committee for guiding doctoral students Cosmin Leordean, Vasile Sărăcuț, Cristian Țîra, Andra Tatar; Faculty of Physics, Babeş-Bolyai University, 2011-2019.

OTHER ACADEMIC ACTIVITIES

- Member of the Physics Commission of the National Council for Titles, Diplomas, and Certificates (CNATDCU), since 2020.
- Member of the Scientific Council of INCDTIM, since 2022.
- Referee in the thesis defense committee, PhD students Cosmin Leordean (2014), Istvan Todor (2019).

PRIZES. SCHOLARSHIPS

- Scientific Excellence Award, Babeş-Bolyai University, 2019.
- 1st Prize, *Premiile Rada Mihalcea pentru Tineri Cercetători în Știință și Inginerie*, 2017.
- Scientific Research Scholarship for doctoral students BD - CNCSIS 2006 (*maximum score*)
- Performance Scholarship, Babeş-Bolyai University, 2004
- 1st Prize, National Physics Olympiad, 10th class, 1998.

Cluj-Napoca,
15.06.2023

Dr. Cosmin FARCĂU