

Award application form

1. Candidate

Biophysics and Biomedical Applications Group and Laboratory ELI-NP, IFIN-HH

Group coordinator: First name: Paul

Second Name: Vasos

Ph.D. since 2004 (*University of Florence, Ph.D. in Structural Biology*)

Position held: Senior Researcher

Institution: Extreme Light Infrastructure Nuclear-Physics (ELI-NP) IFIN-HH
and Interdisciplinary Ph.D. School, University of Bucharest

Phone number:

2. “Gala Cercetării Românești” 2024 Edition

3. Award: Physics, “Șerban Țițeica”

Category: Research Team

4. Team leader of the Biophysics and Biomedical Applications laboratory and group

5. **Research Team:** Our young team (average age = 33 years) consists of eleven researchers who brought important contributions to the success of financed projects we completed during the last 5 years. Seven of the core team members are based at ELI-NP and four other are based at collaborating departments (within IFIN-HH) or institutions, in spectroscopy and biology characterisation laboratories:

- Paul Vasos, Senior Researcher at ELI-NP, Ph.D. 2004
- Mihai Vodă, Junior Researcher at ELI-NP, Ph.D. 2006
- Aude Sadet, Junior Researcher at ELI-NP, Ph.D. 2017
- Catalin Tuta, Junior Researcher at DRMR-IFIN, Ph.D. 2021
- Roxana Popescu, Junior Researcher at DFVM-IFIN, Lecturer UPB, Ph.D. 2016
- Anamaria Hanganu, Researcher at ICOS, Ph.D. 2011
- Ioana Fidel, Research assistant at ELI-NP, Ph.D. student UniBuc since 2021
- Silvana Vasilca, Chemist at ELI-NP, Ph.D. student UniBuc since 2016
- Alexandru Topor, Chemist at ELI-NP, Ph.D. student UniBuc since 2019
- Octavian Ianc, Student Physics, UniBuc), Technician at ELI-NP, B. Sc. started 2021
- Diana Serafin, Student Medical Physics, UMF), Technician at ELI-NP, M.Sc. 2023

6. Scientific achievements

The Biophysics and Biomedical Applications team at ELI-NP, IFIN-HH, conducts interdisciplinary research at the interface of physics, biology and chemistry to unlock advancements in biomedical applications. We introduce new biomolecular spectroscopy methods for early diagnostic in oncology and use these methods to investigate the biomolecular effects of high dose-rate radiation on cells.

6.1 Research results

The team coordinator, Paul Vasos, holds an *International Ph.D. in Structural Biology awarded jointly in 2004 by Univ. of Florence, Univ. of Frankfurt and Univ. of Utrecht*. PV has more than 20 years of experience in developing magnetic resonance methods with applications in biochemistry and medical diagnostic. PV is a member of the *Board of the largest European Magnetic Resonance society, the Ampère Committee* (position renewed in 2023 for 4 years, <https://www.ampere-society.org/Organization.html>).

6.1.1 Internationally- recognised achievements and advances for Romanian science

The present application's first purpose is to help ensure the stability and cohesion of our team via recognition of its interdisciplinary research. Frontier research in science often requires new observation means. In biomedical developments, sensitive methods for diagnostic via spectroscopy on adapted timescales are necessary to translate discoveries from the bench of biophysics research to the clinic. The field of high dose-rate ('FLASH') radiation promises reduced toxicity for radiotherapy, yet the challenges of this research involve **the current limits of sensitivity and the timescales of spectroscopy**.

PV and the team are among the pioneers of sensitivity enhancement in Nuclear Magnetic Resonance (NMR) via **Dynamic Nuclear Polarisation (DNP)**, which led to improved sensitivity in detection by factors of more than 10'000. Since our team started research in Bucharest (2017) we brought high-profile Romanian contributions to sensitivity-enhanced magnetic resonance-based using DNP-NMR (via patents and publications in journals with impact factors as high as 17). Thus, we joined the research community in diagnostic methods for oncology and biospectroscopy from hospitals and academic institutions in the US and Europe (UCSF, MD Anderson, Univ. College London, Cambridge, Sorbonne Universités). In light of our contributions to the field, the first DNP apparatus in Eastern Europe is now installed in Romania (at ELI-NP, IFIN-HH, 2023).

Developments of new magnetic resonance technology: Important advances for *dissolution*-DNP (*d*-DNP) achieved at the Polytechnic School in Lausanne (EPFL) by PV and collaborators (CH-SNF Ambizione 2009-2011 with *PV as principal investigator*) led to further financing from the Swiss Commission for Technology and Innovation: Grant 9991.1 PFIW-IW to G. Bodenhausen, P. Dyson, J.-P. Ansermet, and P. Vasos, 2010 developed **gyrotron-based DNP**, a product of Bruker Biospin that has since commercialized to a large number of groups and consortia (> 100). It is noteworthy to

mention that DNP research has been supported by the governments of various countries as it was introduced, as a recognition of the importance of sensitivity enhancement in magnetic resonance diagnostic. The impact of *d*-DNP technology (invented in Denmark in 2003) to various countries have been recognised – e.g., by France with a "légion d'honneur" - and several prizes have been awarded at US conferences for contributions related to the topic. Indeed, once established in the clinic, DNP-enhanced magnetic resonance is expected to become more frequently used for functional diagnostic than PET-CT. DNP-NMR with endogenous molecules enables diagnostic both *in vivo* and on *ex-vivo* probes, and thus can contribute to developing personalised medical approaches. In oncology, the functional diagnostic of radiation dose-rate effects requires both improved sensitivity and new spectroscopy timescales. We extend the NMR real-time observation window to minutes for relevant metabolic substrates and enhance NMR sensitivity using DNP. This will enable real-time detection of the cell transformations for biomarkers of radiation effects at the **high dose-rates** (characteristic for high-power laser related radiation). Our research involved so far **biomedical collaborations** with Hospital Georges Pompidou (4 publications), Hopital Univ. de Geneve (1 paper), Univ. of Cambridge Cancer Research Centre and General Electric Healthcare (DNP for clinical diagnostic group – 2 publications), Amethyst Radiotherapy Romania (submitted publication, 2023, joint project UEFISCDI-PED 2021-2023).

6.1.2 *Beyond the state of the art*

A new method rendering possible **2D NMR spectroscopy enhanced by dissolution-Dynamic Nuclear Polarisation (*d*-DNP)** was introduced in a collaborative research work coordinated by PV involving researchers from Sorbonne Universités and University of Vienna. Two-dimensional hyperpolarised spectra using DNP-enhanced deuterated water (HDO) as a continuous source of polarization was demonstrated (A. Sadet, ..., and P. R. Vasos*, *J. Am. Chem. Soc.* 2019). Prior to this discovery, the hyperpolarization method employed for *high-sensitivity NMR* was incompatible with the long acquisition times of 2D spectroscopy. With this contribution, molecular transformations and interactions can be followed at atomic resolution in real time, and the identification of complex metabolites in blood or cells is facilitated.

New spectroscopic time-scales were rendered accessible by our team's research in **long-lived nuclear spin order – long lived states (LLS) and long lived coherences (LLC's)**, which extend the observation timescale of various chemical and biological processes. LLS were recently adapted to study in real-time biochemical transformations of key metabolites such as glutathione, **the main antioxidant responding to radiation-related stress in cells**. Two *crescendo* research contributions developing the spectroscopic method all the way to in-cell work were published in *J.Phys.Chem.Lett* 2022 (Teleanu, al., and Vasos*) and in *J.Phys.Chem.Lett.* 2023 (Teleanu, Hanganu, al., and Vasos*).

Long-lived coherences (LLC's), nuclear spin transitions with long relaxation times, introduced for high-field NMR by Paul Vasos (*Phys. Rev. Lett* 2010, *corresponding author, US and EU patents as first author), were advanced to obtain structural constraints for proteins (talk at the *Experimental NMR Conference* 2023, California by PV, submitted article by O. Ianc, al., and P. Vasos, 2023).

6.2 Research activity impact

The results of the team's coordinator research during the **19 years of experience post-Ph.D. (22 years post-M.Sc., age 46)** can be evaluated on the basis of articles by the PI as main author which have a cumulated impact factor **IF(main author) = 162**; for **corresponding-author contributions, with the three teams coordinated during the career, the cumulated IF = 125**, and the mean value/article **IF(corresponding author) = 5.4**. Most of the papers published as team coordinator are in Q₁ journals (71 %). PV's publications accumulated 30.5 citations/paper. PV's Hirsch factor is H = 25 (Google Scholar, H=23 according to Scopus, with or without self-citations). Paul Vasos, the team coordinator, authored **3 European patents, 3 US patents and 2 national patents**. The two national patents were published by the team during the last 3 years, OSIM-A00326/2021 and A100144/2023. **Relevant mentions** of our publications include citations in **Nature Protocols, Proceedings of the National Academy of Sciences**, etc., and our patents are cited by new patents from institutions like Harvard University and leading biospectroscopy companies. **The total number of citations for PV articles is 2150** (Google Scholar), 1600 (Scopus, without self-citations); Average citations/paper > 32 (Scopus, without self-citations).

6.3 Projects obtained by the group coordinator

Paul Vasos has a track record of **continuous independent-source** financing for the created teams starting from 2008, i.e., 4 years after Ph.D. Funding totals **7 grants, raising ca 1.5 Meur as PI**, respectively **5.5 MEur** as partner, as detailed in chapter 9 of this application.

6.4 International visibility

Since 2019: **Member of the Committee of the Ampere Society**, largest Magnetic Resonance society in EU, organiser of Euromar, other European conferences and PhD schools (**mandate renewed by the committee in 2023**); More than 30 oral presentations (15 invited, 3 keynote lectures), detailed in the CV, including invited talks at the World Wide Magnetic Resonance Conference joining the two major conferences in the field, ENC-US and Euromar, at the US Gordon Conference, and the keynote speaker invitation for the magnetic Moments in Central Europe Conference in Vienna.

Books: 2 published book chapters, editor: Royal Society of Chemistry

Reviewer and editorial activity: reviewer of projects for ERC starting grants and for various national foundations, Editor for *Frontiers in Chemistry*, reviewer for: American Chemical Society, Royal Society of Chemistry, Elsevier;

Journal interview: Bulletin of the Ampere Society, 2022, Researcher profile

Premiul Academiei Romane N. Teclu, 2019

Nominated for Latsis EPFL Prize, 2010

6.5 Organisation and coordination

PV coordinated research groups with *continuous independent PI funding* at:

- **Swiss Polytechnic School in Lausanne** (EPFL, 2008-2011 – Ambizione grant of the Swiss national council): 2 PhD and 2 MSc students

- **Biomedical School of the Paris-5 University** in Paris (2010 – 2016, Professor of Biospectroscopy at the Biomedical school and coordinator of the Magnetic Resonance team): 1 Post-Doc., 1 PhD, 4 MSc students, 2 Maitres de Conferences, 1 Engineer (half-time), 1 researcher (half-time);

- **at ELI-NP, IFIN-HH** (since 2017): current team, 11 core members.

Post-doctorates: Dr R. Balzan (2013–2016, Université Paris Descartes); Dr A. Sadet (2017-2019 Univ. Bucharest and ELI-NP); Dr V. Nastasa, Dr Th Asavei (ELI-NP). **Ph.D. students:** F. Teleanu (since 2020), I. Fidel (since 2021), A. Ciumeica (since 2022), L. Fernandes (2012–2015)- currently at Ipheos, R. Sarkar (2006-2010)–currently engineer, Univ. Munchen, P. Ahuja (2007-2011)–currently at AstraZeneca (co-supervision with G. Bodenhausen); **MSc, BSc students:** D. Serafin, O. Ianc (UniBuc, UMF) Z. Wang, A. Sadet, C. Guerniou (**Paris-V**), A. Bornet, L. Angue (EPFL).

Habilitation, Ph.D., other committees (selected): 2011-2014 Biomedical School representative in the Paris V Committee for Certification of PhD supervisors („Habilitation’) in Basic Sciences, Engineering, and Life Sciences; 2013: selection of a Professor in Chemistry (Univ. Babes-Bolyai); PhD and HDR theses committees: EPFL 2010 (Biomolecular Imaging); Univ. le Mans 2012 (NMR methods); ESPCI-Paris 2015 (Dynamic Nuclear Polarisation, „Habilitation’ thesis).

Impact: reflection in students career track, scientific and society developments

The research, published as corresponding author in a trail of papers JACS 2007, PNAS 2009, JACS 2009, PRL 2010, MRC 2016, JACS 2019, JPCL 2023, as well as EU, US and national patents, advanced the careers of group members. PV became a group leader at ELI-NP (*Biophysics group and laboratory*), transferring know-how from the experience acquired in France (University Professor at Paris-V Biomedical School starting at age 33 -one of the youngest full professors in France), Switzerland (Swiss National Science Foundation Fellow), Univ. of Maryland and Univ. of Florence. PV’s **current Ph.D. students** I. Fidel, F. Teleanu, and A. Ciumeica received mobility grants for experimental campaigns and training in the US (Fulbright), at MPI Goettingen (DAAD scholarship) and at the Univ. of Florence (iNext-Discovery and Ph.D. training grants). Training for B.Sc. and M.Sc. students offered in our group, which led to the recruitment of O. Ianc and D. Serafin will be continued. The modern research themes approached by our group will allow researchers to submit projects for ERC grants, both at starting and advanced levels.

7 Curriculum Vitae

Team coordinator: Paul Vasos

1. Degrees and Diplomae:

2000 – 2004: University of Florence, Ph.D. in Structural Biology

(International Ph.D. awarded jointly with the Univ. of Frankfurt and Univ. of Utrecht).

Ph.D. thesis: Physical methods for the study of the structure and stability of macromolecules: development of new NMR approaches and applications to metalloproteins, University of Florence, (Prof. I. Bertini, Prof. C. Luchinat, Prof. I. Felli)

Training period at the Univ. of Utrecht (2003) – Prof. R. Boelens and Prof. A. Bonvin

1995 – 2000 University of Bucarest Master in Physics of Atoms and Molecules

MSc-2 thesis: *Structural modelling of Fe₂S₂ ferredoxins: an analysis of fold and function*, University of Bucharest and University of Florence, 2001 (Prof. I. Bertini, Prof. C. Luchinat, Prof. A. Rosato)

MSc-1 thesis: *Etude du dépliement de la beta-lactoglobuline par RMN*, Joseph Fourier University, Grenoble, University of Bucharest (Prof. V. V. Grecu, Prof. C. Palivan, Prof. J.-P. Cohen-Addad)

2. Professional activity:

2016 – present: Extreme Light Structure Nuclear-Physics (ELI-NP), senior researcher, research team coordinator: **Biophysics and biomedical applications laboratory and group:** 3 junior researchers, 1 technician, 3 Ph.D. and 2 M.Sc. students;

University of Bucharest, Interdisciplinary Ph. D. School, Professor of Chemistry, Ph.D. advisor

2010 – 2016: Paris Descartes University (Paris-V, now Univ. Paris Cité), Professor of Chemistry,

Research team coordinator: research team composed of 2 Maitres de Conférences, 1 Research Engineer (half-time), a CNRS researcher (half-time), Post-Doc., PhD and MSc students;

Coordinator of the Master-2 Program in Spectroscopy towards Life Sciences, Paris Descartes; Teaching and coordination of teaching at various levels : Licence 2, MSc 1,2 (200h teaching /yr)

2008 – 2011: Ecole Polytechnique Fédérale de Lausanne : Senior Researcher (and lecturer at BSc-2 and PhD level) with independent funding (Ambizione – Swiss National Science Foundation)

2005 – 2008: Ecole Polytechnique Fédérale de Lausanne (EPFL): Post-doctorate

2004 – 2005 : University of Maryland (College Park, Washington, DC) Post-doctorate

Spoken languages: English (fluent), French (fluent), Italian (fluent), Greek (notions)

2.1 Project Management: - 14 financed projects as PI or partner (ca 5.5 MEur)

- 7 projects as Principal Investigator (ca 1.5 MEur)

Selected: 2008 – 2011: PI *Storing slow processes in spin memory: long-lived states* - 250 kEUR Swiss National Science Foundation (SNSF) and EPFL; **2014 – 2016: PI** *Enhanced nuclear magnetic resonance to follow biomolecules in complex environments: NMR@Com* - 300 kEUR IdEx (,Initiatives d'Excellence', French Research Ministry); **2013 – 2015: PI** *Polarisation nucléaire dynamique (DNP) et dissolution suivies par électroporation et RMN* - 100 kEUR (Fondation pour la Recherche Médicale); **2012 – 2015: PI** *Longues durées de vie de l'aimantation et hyperpolarisation pour études RMN dans la cellule* - 70 kEUR (DIM Analytics Reg Ile de France); **2011: ERC** phase II project (fundable project – first 20 %); **2015 – 2016 :** Hubert Curian Partnership, PHC BRANCUSI

Partner in projects: (between 250 kEUR and 2.5 MEur) French Equipex, IdeEx, Swiss National Science Foundation, Swiss Commission for Technology and Innovation, EUROHyperpol, PHC Brancusi, EU COST.

2.2 Scientific Coordination:

Post-doctorates: Dr V. Nastasa, Dr Th Asavei, Dr A. Sadet (2017-2019 Univ. Bucharest and ELI-NP), Dr R. Balzan (2013–2016, Université Paris Descartes), **Ph.D. students:** F. Teleanu (since 2020), I. Fidel (since 2021), A. Ciumeica (since 2022), L. Fernandes (2012–2015)- currently at Ipheos, R. Sarkar (2006-2010)–currently engineer, Univ. Munchen, P. Ahuja (2007-2011)–currently at AstraZeneca (co-supervision with G. Bodenhausen); **MSc, BSc students:** D. Serafin, O. Ianc (UniBuc) Z. Wang, A. Sadet, C. Guerniou (Paris-V), A. Bornet, L. Angue (EPFL) Committees (selected): selection of a Professor in Chemistry (Univ. Babes-Bolyai); PhD and HDR theses committees: EPFL 2010 (Biomolecular Imaging); Univ. le Mans 2012 (NMR methods); ESPCI 2015 (Dynamic Nuclear Polarisation, ,Habilitation' thesis).

2011-2014 Biomedical School representative in the Paris V Committee for Certification of PhD supervisors (,Habilitation') in Basic Sciences, Engineering, and Life Sciences;

2.3 Honours and prizes:

2023: Invited Professorship, Univ. of Vienna (semester Oct. 2023-Jan. 2024); **2019:** Romanian Academy Award *N. Teclu*; **2010:** Nominated for the Latsis prize, EPFL; **2008 - 2011:** Awarded the ,Ambizione' SNCF – Elvetia; **2002 – 2004:** Young Scientist European Scholarship; **1995 – 2000:** Merit scholarship of the Romanian State (renewed each semester for top 5% students)

Grants awarded to supervised Ph.D. students and post-docs: national grant for in-cell NMR Ph.D. school (I. Fidel, 2023); grant for participating at the Univ. Florence Ph.D. school on in-cell NMR (A. Ciumeica, 2023), Fulbright scholarship to New York University 2023 (F. Teleanu), iNext high-

field NMR measurement campaign (F. Teleanu, 2022), young research ELI-NP competition (silver medal D. Serafin, 2023, bronze medal F. Teleanu 2022), nomination for Varian award at ENC California 2019 (A. Sadet), post-doctoral fellowship by IdEx (R. Balzan, 2012-2015); Ph.D. scholarship by the Fondation Medicale, France (L. Fernandes, 2011-2014)

3. Scientific communication, representation:

Since 2019: **Member of the Committee of the Ampere Society**, largest Magnetic Resonance society in EU, organiser of Euromar, other European conferences and PhD schools (mandate renewed by the committee in 2023);

> 30 oral presentations (15 invited, 3 keynote lectures), of which:

Univ. Vienna, NMR for biomolecular kinetics - semester course 2023-2024 (invited professor); ENC California, 2023 (selected), Diaspora Timisoara 2023 (invited), Univ. Florence Chemistry Doctoral School (invited, 2023), Euromar 2022 (selected), Univ. of Split 2022 (invited), Nuclear Photonics 2018 (invited), RICCE 2017 (invited keynote); Magn. Moments Centr. Europe (MMCE), Vienna 2012 (invited keynote), Univ. Southampton 2015 (invited), Univ. Basel 2014 (invited), Biopolymers, Nove Hradky 2011 (invited), NMR of Biological Solids, Paris 2011 (invited); Colloque de la Section de Physique, EPFL, March 2010 (invited); ENC 2010 Florida, USA (selected), Joint Euromar and Ismar Conference 2010 (invited); Protein NMR Advanced School GIDRM, Univ. Torino, 2009 (invited); Gordon Conference Biddeford, ME 2009 (invited).

Reviewer and editorial activity: reviewer of projects for ERC starting grants and for various national foundations, Editor for Physical Chemistry and Chemical Physics, Frontiers in Chemistry, Editor for IntJMolSci, reviewer for: American Chemical Society, Royal Society of Chemistry, Elsevier (ChemPhysChem, Analytical Chemistry, PhysChemChemPhys, Journal of Magnetic Resonance);

Journal interview: **Bulletin of the Ampere Society, 2022**, Researcher profile

Curriculum Vitae

Mihai Adrian Vodă



Adrian Voda

Date of birth: 14/09/1975 | Nationality: Romanian | Gender: Male |

Phone number:) | Email address:

WORK EXPERIENCE

01/07/2021 – CURRENT Magurele, Romania
RESEARCH SCIENTIST IFIN-HH, ELI-NP

06/2008 – 06/2019 Vlaardingen, Netherlands
SCIENCE LEADER/ R&D MANAGER UNILEVER RESEARCH

I lead the spectroscopyµstructure team to enable product innovation and development in R&D projects. The science area consisted of analytical techniques such as NMR, MRI, rheo-MRI, XRD (SAXD, SAXS, WAXD) and Raman for microstructure investigation and characterization. The applications covered food, home and personal care businesses, where a broad range of natural and synthetic materials are present, such as fibres, proteins, oils&fats, polymers, keratins, etc.

Vlaardingen, Netherlands
ANALYTICAL PROJECT LEADER / WORKSTREAM LEADER UNILEVER RESEARCH

I coordinated multidisciplinary teams to solve product development problems regarding multi-length scale microstructures. I lead the analytical workstream in the research program for development of novel fats processing, where the team ultimately developed structure-process-function relationships of novel fat crystal networks. We have employed techniques such as XRD/SAXS, NMR (1H, 13C, TD-NMR, rheo-MRI), EM (cryo-TEM, cryo-SEM), CSLM, Raman imaging, DSC, and GC/LC-MS. These contributions were of paramount importance for the business, and the new products hit the production line after the largest CapEx Unilever ever had (USD 200 mln.).

Vlaardingen, Netherlands
ANALYTICAL COORDINATOR / ACTIVITY LEADER UNILEVER RESEARCH

I coordinated various analytical activities conducted by small groups in projects with high impact on the business: foods structuring with fibres, microstructure of Bouillon cubes, fat structuring, impact of actives on the hair fibre at nanoscale, self-assembly systems for hair care products. Furthermore, I was part of research teams of many R&D projects, covering foods (savoury dry/wet, spreads&dressings), beverages (ice cream, refreshments), personal care (hair and oral care) and home care (laundry).

EDUCATION AND TRAINING

01/07/2006 – 01/05/2008 Aachen, Germany
POSTDOC RWTH Aachen

Molecular diffusion and interdiffusion in multi-phase liquid systems. I conducted the NMR work and was part of the Collaborative Research Centre SFB540.
Microcoil design and manufacturing for MR micro-imaging applications.
MRI and relaxometry work conducted on service contracts with material science and pharma industry.

Website www.rwth-aachen.de

01/10/2002 – 01/07/2006 Aachen, Germany
DR. RER. NAT. RWTH Aachen

Solid-state NMR methods to study order and dynamics in elastomers and thermoplastics. Funded by DFG, Continental (tire industry), Freudenberg (thermoplastics industry).
Molecular diffusion and interdiffusion in multi-phase liquid systems. Funded by SFB540.
Experimental and simulations work on optimizing the design of Halbach type permanent magnets for portable NMR.

Website www.rwth-aachen.de | Final grade Magna cum laudae |

Thesis Advances in studying order and dynamics in condensed matter by NMR

01/10/1998 – 30/06/1999 Cluj-Napoca, Romania
M.SC. BIOPHYSICS AND MEDICAL PHYSICS Babes-Bolyai University

Website www.ubbcluj.ro

01/03/1999 – 01/06/1999 Lyon, France
M.SC. THESIS WORK Universite Claude-Bernard, Centre Hospitalier Lyon-Sud

Website www.univ-lyon1.fr

01/10/1994 – 06/1998 Cluj-Napoca, Romania
PHYSICIST Babes-Bolyai University

Website www.ubbcluj.ro

10/2017 – 11/2017 Wageningen, Netherlands
CERTIFICATE NUTRITION AND HEALTH Wageningen University & Research

Website www.wur.nl

● LANGUAGE SKILLS

Mother tongue(s): ROMANIAN

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C2	C2	C2	C2	C2
DUTCH	B2	B2	B1	B1	A2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

● DIGITAL SKILLS

Microsoft Office | Matlab | C/C++

Curriculum Vitae

Alexandru Topor



Curriculum Vitae

Topor Alexandru

PERSONAL INFORMATION

Alexandru Topor



Address Calea 13 Septembrie nr. 060023, Bucharest, Romania



Website

Sex Male | **Date of birth** 10th November 1990 | **Nationality** Romanian

EDUCATION AND EMPLOYMENT

2021 - present

Chemist

Horia Hulubei National Institute of Physics and Nuclear Engineering

– Extreme Light Infrastructure – Nuclear Physics

March 2021 - present

2020 - present

Chemist

Faculty of Applied Chemistry and Materials Science - POLITEHNICA

Bucharest National University for Science and Technology - Project

PN-III-P1-1.1-TE-2019-0352

September 2020 - April 2022

2019 - present

PhD Studies

Doctoral School of Chemistry – Faculty of Chemistry – University of

Bucharest

2019 - 2020

Chemist

Research center for applied inorganic chemistry – University of

Bucharest – Project PN-III-P1-1.1-TE-2016-1633

September 2019 - July 2020

2017 - 2019

Masters programme graduate: Chemistry of Advanced Materials

Valedictorian

Faculty of Chemistry – University of Bucharest

2014 - 2017

Bachelors in Chemistry graduate

Faculty of Chemistry – University of Bucharest

Native Language

Romanian

Other Languages

	COMPREHENSION		SPEAKING		WRITING
	Listening	Reading	Conversation	Oral discourse	
English	C2	C2	C2	C2	C2

DIGITAL APTITUDES

SELF EVALUATION				
Information processing	Communication	Content creation	Security	Problem solving
Independent	Experienced	Independent	Elementary	Elementary

CONFERENCES AND DISTINCTIONS

- ~~Student Communications Session Faculty of Chemistry, University of Bucharest III Ed. 2017 1st place, Bachelors - Communication~~
- ~~European Conference on Molecular Magnetism 2017 Bucharest, Romania~~
- ~~Student Communications Session Faculty of Chemistry, University of Bucharest XIV Ed. - 2018 1st place Masters Section - Communications , Best presentation Award – Romanian International Chapter of ACS~~
- ~~International Conference Faculty of Chemistry and Chemical Engineering Bolyai University, Cluj-Napoca XVI Ed. 2019 Romanian Chemical Society Award - Communication~~
- ~~International Conference of the Chemical Societies of the South-Eastern European Countries IX Ed. Targoviste 2019 Poster.~~
- ~~Bachelors, Masters and PhD Students Communications Session Faculty of Chemistry - University of Bucharest XV Ed. 2019 1st place Bachelors and Masters Section – Communication~~
- ~~Romanian International Conference on Chemistry and Chemical Engineering XXI Ed. Bucharest 2019 Poster~~
- Student Communications Session Faculty of Chemistry, University of Bucharest XVI Ed. 2021 1st place PhD Section - Communication

Curriculum Vitae

Diana Serafin



Curriculum Vitae

Serafin Diana-Cristina

PERSONAL INFORMATIONS

DIANA-CRISTINA SERAFIN



📍 Street George Topârceanu, 10, Mediaș, Sibiu, 551028, Romania



WORK EXPERIENCE

May 2023 – Present

Research Technician

Extreme Light Infrastructure – Nuclear Physics (ELI-NP)

Member of the Biophysics and Biomedical Applications Laboratory

Măgurele, Romania

May 2022- May 2023

Junior Technician

Romanian Academy's Institute of Organic and Supramolecular Chemistry

Bucharest, Romania

May 2021 – May 2022

Internship

Extreme Light Infrastructure – Nuclear Physics (ELI-NP)

Biophysics and Biomedical Applications Laboratory

Măgurele, Romania

EDUCATION

Oct 2023 - Present

MSc Student

Bucharest University of Medicine and Pharmacy

Master of Medical Biophysics and Cellular Biotechnology

2020 - 2023

BSc Student

Faculty of Physics, University of Bucharest

Bachelor's Degree in Medical Physics

2016 - 2020

High School Student

"Școala Națională de Gaz" National College

Mathematics and Informatics specialization

Mediaș, Romania

PERSONAL SKILLS

Native Language Romanian

Other language(s) English, French, German

Communication skills Excellent communication skills gained through public speaking and debate competitions

Managerial/organizational skills Excellent management skills, such as problem-solving, decision-making, teamwork and the ability to handle multiple tasks simultaneously, gained through experience as a coordinator in various events organized by the Physics Students' Association of the University of Bucharest (ASF-UB)

Workplace-acquired skills Knowledge of data analysis tools for research in molecular and nuclear physics: Mathematica (Spin Dynamics package), Matlab (Spinach package), C/C++ programming;
Proficiency in tools for Nuclear Magnetic Resonance spectroscopy analysis: MestReNova and TopSpin;
Laboratory work for investigation of magnetic resonance biomarkers in metabolic profiling studies on irradiated cells: cell passages, cell lysis and sample preparation for Nuclear Magnetic Resonance spectroscopy experiments;
Conducting inventories and acquisitions related to a research laboratory in the field of biophysics.

Driving license AM, B1, B

SUPPLEMENTARY INFORMATION

Publications 2021 – Rotating-Frame Overhauser Transfer via Long-Lived Coherences
<https://doi.org/10.3390/sym13091685>Courses Basics of Nuclear Magnetic Resonance and Advanced NMR Spectroscopy, Université de Lille
Attended the seminars 'Simulation Software in Magnetic Resonance', hosted by Italian NMR Discussion Group (GIDRM)Extracurricular activities 2020-2023 - Volunteer at the Physics Students' Association of the University of Bucharest (ASF-UB)
Sep 2021/2022/2023 - Volunteer at European Researchers' Night
2022 - Volunteer at Măgurele Summer School of Science and Technology (MsciTeh)
2018 – 2020 – Volunteer at '2ForKids'

Curriculum Vitae

Aude Sadet

Firefox

about:blank

Aude Sadet
Born 27/05/1988
Nationality: French

...

Phone: ·
Email:

Work experience

- 2019 – present** **Junior Researcher (CS III) - Extreme Light Infrastructure (ELI-NP/IFIN-HH)**
Biophysics and biomolecular applications group (www.eli-np.ro/lged_bio.php)
- 2019 – 2023** **Maternity leave (3 years)**
I stayed on maternity leave for 3 years (legal) due to my child's health problems
- 2017 – 2019** **Post-Doctorate - Universitatea din București**
Subject: Extending lifetimes and enabling molecular transfer for hyperpolarized nuclear magnetization, Romanian Ministry of Research (UEFISCDI) project
- 2014 – 2017** **Ph.D. student - Ecole Normale Supérieure de Paris / Sorbonne Université Pierre et Marie Curie – Laboratoire des biomolécules (UMR7203)**
Ph. D. Thesis: Enzyme kinetics studied by dissolution-dynamic nuclear polarization Nuclear Magnetic Resonance (d-DNP-NMR): application to the oxidative step of the pentose phosphate pathway
- 2015 – 2017** **Teaching during Ph.D. - Sorbonne Université Pierre et Marie Curie**
Nuclear Magnetic Resonance (NMR) for Bachelor-2 and Bachelor-3 level students
Organic chemistry for Bachelor-2 level students
Solution-state chemistry for Bachelor-1 level students
- 2014** **Internship - Université Paris Cité, Biomedical School – Laboratoire de chimie et biochimie pharmacologiques et toxicologiques (UMR8601)**
Subject: Improvement of the spectral resolution in homonuclear 2D Nuclear Magnetic Resonance (NMR) spectroscopy and adaptation of pulse sequences to Magnetic Resonance Imaging (MRI)
Development of pulse sequences for the characterization of proteins and peptides
- 2013** **Internship - Ecole Supérieure de Physique et de Chimie Industrielles de Paris – Laboratoire de chimie organique (UMR7084)**
Subject: Kinetic resolution of amino alcohols by acyl transfer

Curriculum Vitae, Aude Sadet, pg. 1 / 5

2012 **Internship, Université Paris Descartes, Biomedical School – Laboratoire de chimie et biochimie pharmacologiques et toxicologiques (UMR8601), NMR team**
 Long-lived nuclear spin states, Magnetic resonance for the study of proteins

Education

2015 – 2017	Ph.D. student - Ecole Normale Supérieure de Paris / Sorbonne Université Pierre et Marie Curie Chemical Physics, Analytical Chemistry
2013 – 2014	M.Sc. Université Paris Cité, Biomedical School Chemical and Biological Analyses, Biomedical Engineering
2012 – 2013	Master 1 Université Paris Cité, Biomedical School Chemistry towards Life Sciences, Chemistry-Biology Interface
2009 – 2012	Bachelor of Science, Technology and Health, Université Paris Cité, Biomedical School Chemistry-Biology Interface
2007 – 2009	Medical studies, B.Sc. level, Université Paris Cité, Medical School

Scientific Coordination

- **Publications**

Journal	Articles (corresponding author (CA) / first author (FA))			Impact Factor (IF)
	Nr	CA	FA	
	J. Am. Chem. Soc.	1	0	
Progr. NMR Spectrosc.	1	0	0	8.9
J. Phys. Chem. Lett	1	1	0	5.7
Chem. Eur. J.	1	0	1	5.0
Sci. Rep.	1	0	1	5.0
J. Chem. Phys.	2	0	1	4.3
Faraday Discuss.	1	1	0	4.0
Biophys. J.	1	0	0	4.0
Symmetry	1	1	0	2.94

- **Patent**

Romanian Patent application submitted OSIM-RO-A00727

Metoda de masurare a distantelor intramoleculare sau intermoleculare folosind rezonanta magnetica in stare lichida prin tehnici bazate pe coerente cu timpi de viata lungi ai spinilor nucleari

Inventors: **A. Sadet**, F. Teleanu, P. R. Vasos

- **Book Chapter**

Applications of Singlet Order to the Study of Biomolecules and Molecular Interactions

A. Sadet, V. Nastasa, P. Ghenuche, and **P.R. Vasos***

Long-lived Nuclear Spin Order, UK Royal Society of Chemistry 2020, ISBN 978-1-78801-568-4, 248-265, 2020

Long-lived coherences

A. Sadet, R. Sarkar, F. Teleanu, G. Bodenhausen, **P.R. Vasos***

Long-lived Nuclear Spin Order UK Royal Society of Chemistry 2020, ISBN 978-1-78801-568-4, 371-388, 2020

Conferences

- **Oral Communications at International Conferences**

- | | |
|-------------|--|
| 2019 | <p>Experimental Nuclear Magnetic Resonance Conference (ENC), Asilomar, California
Water-Exchanging Hydrogens' Positions in Biomolecules Detected via Long-Lived Coherences and Hyperpolarized 2D COSY</p> <p>Nominated for Varian Prize, ENC 2019</p> |
| 2018 | <p>Faraday Discussions: Membranes and artificial water channels, Glasgow
Hyperpolarized NMR to follow water proton transport through membrane channels via exchange with biomolecules</p> |
| 2017 | <p>ENC conference, Asilomar, California
Fast enzyme kinetics by dissolution-dynamic nuclear polarization: Insights for the pentose phosphate pathway</p> <p>RMN Ile de France, Paris
Pentose phosphate pathway by dissolution-dynamic nuclear polarization</p> |
| 2015 | <p>Journée jeunes chercheurs, ENS-Paris
How to follow the enzymatic reactions of the pentose phosphate pathway with dissolution-dynamic nuclear polarization</p> |

Curriculum Vitae, Aude Sadet, pg. 3 / 5

- **Posters**

- 2017** **Pasteur meeting, Paris**
Exploring the oxidative branch of the pentose phosphate pathway by dissolution-dynamic nuclear polarization
- 2016** **Groupe Europeen Resonance Magnetique (GERM), Lisbon**
Fast enzyme kinetics by dissolution-dynamic nuclear polarization: Insights for the pentose phosphate pathway

Competences

Spoken Languages: Romanian (B2), English (B2), German (B1), French (*mother tongue*).

Computation and data analysis: Linux, Microsoft Office, Matlab, Scilab, Gamma, Chemdraw, Topspin.

Analytical methods: NMR, UV-vis, HPLC, FPLC, MS.

Sample preparation: Cells, Enzyme solutions, Enzymatic synthesis and purification of drug candidates and biomarkers for imaging

Other: Piano (8 years courses and practice), Violin (4 years), Dance, Equitation (gallop level 5), Ice skating.

Bucharest, August 2023

Curriculum Vitae

Octavian Ianc

OCTAVIAN IANC

Bucharest ◊ Romania

[Github](#) ◊ [LinkedIn](#)

EDUCATION

- University of Bucharest** 2021 - 2024
B.S. in Physics
First two years grade: 10/10 & Academic Performance Scholarship recipient
Member of the *Physics Students' Association from the University of Bucharest* (ASF-UB)
PLANCKS 2022, 2023 international theoretical physics competition - member of Romania's team
- Eberhard Karls Universität Tübingen** Oct 2022 - Jul 2023
ERASMUS Student
Took advanced courses in computational physics and numerical methods
Studied in a very diverse and international environment
- "Gheorghe Lazăr" National College** 2017 - 2021
High School Diploma
Important results in STEM Olympiads and contests on the national level
Intensive Mathematics & Informatics curricula
Programming qualification from the Romanian Ministry of Education
Baccalaureate grade: 9.91/10

EXPERIENCE

- Extreme Light Infrastructure - Nuclear Physics** May 2022 - Present
Research Technician Măgurele, RO
- Member of the *Biophysics and Biomedical Applications Laboratory*
 - Working in the development of NMR techniques for metabolism studies
 - Performing NMR spin dynamics simulations using *Spinach*, *SpinDynamica* and custom-made software
 - Analyzing experimental NMR data and protein structural models
 - Performing cell culture and sample preparation protocols
- Romanian Academy's Institute of Organic and Supramolecular Chemistry** Sep 2023 - Present
Research Technician Bucharest, RO
- Research project aimed at measuring the metabolic effects of reactive oxygen species using magnetic resonance spectroscopy.
- Max Planck Institute for Biological Cybernetics** Oct 2022 - Jul 2023
Student Intern Tübingen, DE
- Learned about the computational models used for simulating the human primary visual cortex
 - Employed Python programming and image processing techniques

LANGUAGES

- English** Professional knowledge - CEFR C2
Romanian Native speaker
German Good knowledge - CEFR B2

TECHNICAL STRENGTHS & QUALIFICATIONS

Programming Languages Python, C++, Wolfram Mathematica, Matlab, Julia
Technologies SciPy, Tensorflow, Keras, ROOT, Django
Tools Git, LaTeX, HTML, Microsoft Office

IBM Quantum Challenge: Spring 2023 Achievement *May 2023*
Data Structures and Algorithms *Aug 2022*
IBM Machine Learning Professional Certificate *Jul 2022*
IBM Quantum Spring Challenge 2022 Achievement *May 2022*

PUBLICATIONS

Long-lived Coherences for Magnetic Interactions in Proteins bioRxiv 2023.07.22.550138
Polarization of Charged Spherical Dielectric Core-Shell Romanian Journal of Physics, Vol. 68, Nr. 1-2, 2023
Two-body Motion in Central Conservative Force Fields Romanian Reports in Physics, Vol. 74, Nr. 4, 2022

EXTRACURRICULAR ACTIVITIES

Physics Students' Association from the University of Bucharest (ASF-UB) Oct 2021 - Present
Secretary General for the 2022-2023 term
President for the 2023-2024 term

- Participated in the organization of multiple events for students
- Coordinated the 2023 *Introductory Week* for the new students in our faculty
- Created a web software platform for the *Be a Feynman* physics competition

Măgurele Summer School of Science and Technology 2022 Aug 2022
Mentor

- Coordinated a group of high-school students in building an IOT Weather Station
- Employed micro-controller development, data transfer, processing and visualization

MEMBERSHIPS

International Society for Magnetic Resonance in Medicine (ISMRM) Nov 2023 - Present
Trainee Member

Curriculum Vitae

Silvana Vasilca



Curriculum Vitae

Silvana Vasilca

PERSONAL INFORMATION **Silvana Vasilca**



Sex: female | Date of birth: 28/01/1992 | Nationality: **Romanian**

WORK EXPERIENCE

- March 2020 - Present** **Chemist**
Extreme Light Infrastructure - Nuclear Physics (ELI-NP)
- March 2015 - Present** **Chemist**
Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering (IFIN-HH)
- February, March 2016** **Mobility project**
Center for Nuclear Studies and Technologies (C2TN), Bobadela, Portugal
- September - October 2015** **Internship**
Atomic Energy and Alternative Energies Commission (Commissariat à l'énergie atomique et aux énergies alternatives) (CEA), AEC-Nuclear, Grenoble, France
- October 2014- February 2015** **Internship**
IRASIM, Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering (IFIN-HH)
- July 2013** **Internship**
National Institute of R&D for Chemistry and Petrochemistry (ICECHIM)

EDUCATION AND TRAINING

- 2016-Present** **PhD Program**
Faculty of Chemistry, University of Bucharest, Romania
- 2014-2016** **Master „Chemistry of Advanced Materials“**
Faculty of Chemistry, University of Bucharest, Romania
- 2011-2014** **Bachelor „Chemistry“**
Faculty of Chemistry, University of Bucharest, Romania
- 2007-2011** **Highschool „Computer programming“**
„David Prodan“ National College, Cugir, Romania

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	C2	B2	B2	B2

Levels: A1/A2 Basic user - B1/B2 Independent user - C1/C2 Proficient user
 Common European Framework of Reference for Languages

Communication skills

- IFIN-HH Outreach
- 2011-2014 psychological - pedagogical teaching module
- Good ability to adapt to multicultural environments, very good communication skills, *offhand*, creative, responsible, flexible and open mind, adaptive capacity

Job-related skills

Synthesis and analytical chemist with good understanding of principles for operation and data analysis in spectrometric methods: FTIR & Raman Spectroscopy, Mass Spectrometry (GC-MS, LC-MS, ICP-MS), Thermal Analysis (TGA and DSC) and Scanning Electron Microscopy (SEM)

Computer skills

- Pascal programming
- C programming
- Oracle programming
- Advanced knowledge in Microsoft Office

ADDITIONAL INFORMATION

- BBC's Science Communication Course (2012)
- Astronomy Course at the Romanian Astronomical Observatory "Amiral Vasile Urseanu" (2012-2013)
- IFIN-HH's Course "Introduction to Nuclear and Particle Physics" (2016)

Publications

- TD-GC-FID based approach for monitoring indoor borne styrene and optimization of irradiation conditions for radiopolymerization in consolidated artifacts. **Silvana Vaslica**, Marian Vigolici, Mihaela Cutrubinis, Valentin Moise, Ioana Stanculescu, Quốc Vũ Trí Tran, Andrei Medvedovici, *Journal of Liquid Chromatography & Related Technologies*, 2019, 42, 217-224.
- Consolidation of very degraded cultural heritage wood artefacts using radiation curing of polyester resins. Valentin Moise, Ioana Stanculescu, **Silvana Vaslica**, Mihaela Cutrubinis, Elena Pinou, Petruta Oancea, Adina Raducan, Vorica Meltzer, *Radiation Physics and Chemistry*, 2019, 158, 314-319.
- The crosslinking behaviour of cellulose in gamma irradiated paper. Ioan Valentin Moise, Mihaela Maria Manea, **Silvana Vaslica**, Cosmin Priite, Marian Vigolici, Mihaela Cutrubinis, Ioana Rodica Stanculescu, Vorica Meltzer, *Polymer Degradation and Stability*, 2019, 160, 53-59.
- Complex investigation of the five 19th century Russian-Lipovan icons. Seler Serafimaa, Octavian G. Duliu, Maria-Mihaela Manea, **Silvana Vaslica**, Cristiana Radulescu, Bogdan Constantinescu, Daniela Stan, Otilia-Ara Culicov, Inga Zinovcscas, *Microchemical Journal*, 2019, 150, 104126.
- Physicochemical study for characterization of lyophilized collagens irradiated with gamma radiation and for

optimization of medical device manufacturing process, V. Moise, **S. Vasilca**, A. Baltac, C. Pintile, M. Virgolici, M. Cutrubinis, C. Kamezian, D. Dragan, M. Ena, F. Albota, S. Maier, *Radiation Physics and Chemistry*, 2020, **170**, 106658.

- Magnetization Lifetimes Prediction and Measurements Using Long-Lived Spin States in Endogenous Molecules, F. Teleanu, C. Tuță, A. Cuccoanes, **S. Vasilca**, P. R. Vesos, *Molecules*, 2020, **25**(23), 5495.
- Multifunctional Leather Surface Design by Using Carbon Nanotube-Based Composites, Maria Stanca, Carmen Gadzu, Cosmin-Andrei Alexe, Ioana Stanculescu, **Silvana Vasilca**, Andreea Matei, Demetra Simion, Roxana-Rodica Constantinescu, *Materials*, 2021, **14**, 3003.
- The influence of sugar-protein complexes on the thermostability of C-reactive protein (CRP), Andreea Lorena Mateescu, Nicolae-Bogdan Mincu, **Silvana Vasilca**, Roxana Apetriu, Diana Stan, Bogdan Zorila, Dana Stan, *Scientific Reports*, 2021, **11**, 13017.
- N.M. Florea, C.R. Nita, C. Sotly, R.M. Marginean, M. Baculum, M. Enculescu, N. Marginean, E. Matei, P. Mereuta, C. Mihal, **S. Vasilca**, Preparation of 82Se thin films with trigonal hexagonal crystal structure for in-beam nuclear structure experiments, *Vacuum*, 215, 112250 (2023)
- Transition from Natural to Early Synthetic Dyes in the Romanian Traditional Shirts Decoration, I. Petroviciu, I. Teodorescu, **S. Vasilca**, F. Albu, *Heritage*, 6(1), 505-523 (2023)
- Liquid chromatography as analytical tool for the study of natural and early synthetic dyes in traditional Saxon textiles, I. Petroviciu, I. Teodorescu, **S. Vasilca**, F. Albu, A. Medvedovici, *Heritage Science* (2023)
- Supramolecular solvent based method for natural dyes extraction from fibers and holistic chemometric approaches used for assessing induced gamma irradiation's effects: A comprehensive study by LC-DAD-MS analysis, **S. Vasilca**, I. Petroviciu, D. Negut, M. Virgolici, F. Albu, A. Medvedovici, *Microchemical Journal* 189 (2023)

Recent conferences

- A multi-analytical approach to assess the effect of gamma radiation on anthraquinone natural dyes, Silvana Vasilca, Daniel Negut, Irina Petroviciu, Mihails Cutrubinis, Marian Virgolici, Valentin Moise, Andrei Medvedovici, *Second International Conference on Applications of Radiation Science and Technology (ICARST-2022)*.
- Gamma radiation effect on early synthetic dyes, Silvana Vasilca, Irina Petroviciu, Mihails Cutrubinis, Marian Virgolici, Valentin Moise, Andrei Medvedovici, *the 41th Conference on Dyes in History and Archaeology 2022*.
- Polymer-based composite materials obtained by radiopolymerization with applications in Cultural Heritage, Silvana Vasilca, Marian Virgolici, Mihails Cutrubinit, Valentin Moise, Andrei Medvedovici, *the 28th International Nuclear Physics Conference (INPC 2022)*.
- The effect of high dose rate laser driven radiation on the integrity of amino acids and implications in toxicity evaluation, Silvana Vasilca, Roxana Popescu, Andi Cuccoanes, Florin Teleanu, Paul Vesos, *15th International Conference on Nuclear Data for Science and Technology (ND2022)*.
- Transition from natural to early synthetic dyes in the Romanian traditional shirts decoration, Irina Petroviciu, Iulia Teodorescu, **Silvana Vasilca**, Florin Albu, *The 41th Conference on Dyes in History and Archaeology 2022*.
- Development of a new mild extraction method for the analysis of natural dyes in Cultural Heritage textiles by LC-DAD-MS, Silvana Vasilca, Irina Petroviciu, Daniel Negut, Marian Virgolici, Florin Albu, Andrei Medvedovici, *Dyes in History and Archaeology (DHA40)*, 2021.
- FLASH radiobiology experiments with 10 PW lasers: magnetic-resonance biomarkers to demonstrate the low toxicity of Gy/ns dose-rates, Paul R. Vesos, F. Teleanu, **S. Vasilca**, A. Cuccoanes, R. Popescu, I. Fidel, **B. Zorila**, C. Tuța, *3rd International Conference on Nuclear Photonics* (2021).

Curriculum Vitae

Anamaria Hanganu



Curriculum vitae

Personal information

First name/ Surname

Anamaria HANGANU

Address

..... nia

Telephone

E-mail

Nationality

Romanian

Date of birth

16 December 1983

Gender

Female

Desired employment

Senior researcher

Occupational field

Work experience

Date

1 October 2011 - present

Occupation or position held

Senior researcher

Main activities and responsibilities

NMR analyses

Name and address of employer

Romanian Academy, Center of Organic Chemistry „C.D. Nenitzescu”

Type of business or sector

Research

Date

1 November 2006 – 1 Julie 2008

Occupation or position held

Assistant research project

Main activities and responsibilities

Laboratory research

Name and address of employer

“Politehnica” University of Bucharest, Faculty of Applied Chemistry and Materials Science

Website: www.pul.ro

Type of business or sector

Scientific research

Education and training

Dates

1 November 2008 – 30 September 2011

Title of qualification awarded

PhD

Principal subjects/occupational skills covered

- Organic chemistry;
- NMR spectroscopy.

Name and type of organization providing education and training

“Politehnica” University of Bucharest, Faculty of Applied Chemistry and Materials Science
Romanian Academy, Department of Organic Chemistry “C.D. Nenitzescu”

Dates

1 October 2003 – 24 June 2008

Title of qualification awarded

Diplomat Engineer - Chemical Engineering

Principal subjects/occupational skills covered

- Technological equipment used in the food;
- Enzymology;
- Organic Chemistry;
- Analytical Chemistry;
- Toxicology;

Name and type of organization providing education and training: - Macromolecular compounds;
- Food Technology;
"Politehnica" University of Bucharest, Faculty of Applied Chemistry and Materials Science, Food Chemistry Department
Website: www.pub.ro

Dates: 15 September 1999 – 15 June 2003

Title of qualification awarded: Baccalaureate

Principal subjects/occupational skills covered: - Organic Chemistry;
- Analytical Chemistry;
- Inorganic Chemistry

Name and type of organization providing education and training: "Petru Poni" Technical College, Onesti, Bacau, specialization: natural sciences

Personal skills and competences

Mother tongue(s): Romanian

Other language(s):

Self-assessment:

European level (*)

English

French

Understanding				Speaking				Writing	
Listening		Reading		Spoken interaction		Spoken interaction		Listening	
C1	Proficient User	C1	Proficient User	B2	Independent user	B2	Independent user	B2	Independent user
B2	Independent User	B2	Independent User	A2	Basic User	A2	Basic User	A2	Basic User

(*) Common European Framework of Reference for Languages

Social skills and competences: Team spirit, diligence, punctuality, perseverance

Technical skills and competences: Chemistry laboratory equipment (NMR, FT-IR, GC-MS)

Computer skills and competences: Microsoft Office (Word, Excel, PowerPoint), MS Windows, LabView, Mathcad, MathLab, MestReNova, OPUS, ChemBioDraw, MathLab

Other skills and competences: Hobbies: dancing, reading, traveling, music

Additional information

Research Grants:

Doctoral Programme (POSDRU/6/1.5/S/16 - ID - 5159) Sectoral Operational Programme Human Resources Development, 2007 - 2013, "PhD students innovation and competitiveness support"

BIOBUILD project (Project code: PN-II-PCCA-2011-3.2-1367, Contract number: 31/2012), 2012-2015, "Synthesis of some C4, C5 carboxylic acid building block chemicals from renewable biomass resources".

LIGSALCHEM project (Project code: PN-II-ID-PCCE-2012, Contract number: 151/2012), 2012-2015, "Extensive valorization of lignin and salicylic acid to bulk and fine chemicals".

PERCIT project (Project code: PNII-PT-PCCA-2013-4-1388, Contract number: 61/2014), 2014-2017, "Cellular materials with thermal insulation and fire resistance properties, via energetic efficient recycling process of PET wastes, for minimizing heat loss in civil and industrial buildings".

Project code: PN-III-P2-2.1-PTE-2016-0062, 2016 – 2018, "Technology for synthesis of glycerol formal, an ecological polar solvent for use in parenteral administration of drugs"

RESMAG-Hyperpol (Project code: PN-III-P4-ID-PCE-2016-0887, Contract number: 168/2017), 2017-2019, "Reservoirs and magnetisation transfer for hyperpolarised nuclear spins", (<https://www.unibuc.ro/cercetare/promovarea-rezultatelor-cercetarii/proiecte-de-cercetare/proiecte-cu-finantare-nationala/idei-pce-168-2017>)

Project code: PN-III-P1-1.1-TE-2019-1003, "Novel heteroaryl-azo/hydrazone dual switchable systems", 2020-2022 (<http://oxaswitch.mihaelamatache.ro>)

Project code: PN-III-P2-2.1-PED-2019-2079, "Bringing together quantum sieving process and new metal-organic frameworks synthesis to develop a new hydrogen isotope separation technology", 2020-2022, (<https://www.chimie.unibuc.ro/cercetare/anorganica/HYSO-MOF/HYSO-MOF.pdf>).

Scientific achievements:

2010-2024 – 97 papers published;

2010-2024 - 65 communications presented at congresses and conferences of chemistry;

h-index 16 and 667 citations according to ISI Web of Science. (<https://www.webofscience.com/wos/author/record/H-1089-2017>).

Roxana Popescu



Roxana Cristina Popescu

PhD. Eng. Econ.

Bucharest, Romania

Work experience

Postdoctoral researcher

November 2021 - present

"Politehnica" University of Bucharest, Faculty of Applied Chemistry and Materials Science

- R&D in oxide nanoparticle synthesis and characterisation for radiosensitization of tumor cells.

Lecturer, Associate Lecturer

October 2021 - present

"Politehnica" University of Bucharest, Faculty of Medical Engineering, Department of Bioengineering and Biotechnology

- Lecturer for the course and practical applications of "In vitro and in vivo testing of implants" and "Nanoparticles interaction with living tissues" (4th year bachelor studies, Biomaterials and Medical devices specialisation).

Scientific Researcher IIIrd, Scientific Researcher

June 2021 - present

National Institute for R&D in Physics and Nuclear Engineering "Horia Hulubei", Department of Life and Environmental Physics, Magurele, Romania

- R&D in medical technology development for amplification of anti-tumour effects of radiotherapy using nanoparticles.
- R&D in medical technology development for tissue engineering.

Executive Editor in Chief

November 2019 - April 2021

Materials.International, <https://materials.international>, Bucharest, Romania

- editorial process making; organising the peer reviewing process; coordinating the editorial decisions; editing articles received for publishing.

Engineer

November 2014 - March 2021

National Institute for R&D in Physics and Nuclear Engineering "Horia Hulubei", Department of Life and Environmental Physics, Magurele, Romania

- R&D in biomaterials fabrication and testing.
- Working placement at IUCN Dubna project no. 323/2018- Developing new strategies to fight cancer by combining proton therapy with nanoparticles and imaging of radiation using Timexpix-3 detectors.

Visiting PhD student

January 2019 - July 2019

Medical University of Vienna, Department of Radio-Oncology, Vienna, Austria

- OeA Ernst Mach Grant- worldwide award: "Improvement of the tumour response to radiotherapy (including ion beam therapy) by nanoparticles".
- R&D in in vitro evaluation of nanoparticles radiosensitisation in 2D and 3D tumour cell models.
- techniques for obtaining and characterisation of 3D tumour cell cultures.

Visiting PhD student

October 2017 - August 2018

Heidelberg University, Medical Faculty of Mannheim, Department of Radiotherapy and Radio-Oncology, Mannheim, Germany

- DAAD Research Grants for Doctoral Candidates and Young Academics and Scientists: "Development and testing of novel multifunctional nanosystems for chemo- and radio-sensitizing of tumour cells".
- R&D in in vitro evaluation of nanoparticle radiosensitization of different nanoparticles in 2D tumour cell models.
- specific radiobiological testing techniques, transmission electron microscopy techniques for investigation of biological substrates, flow cytometry analysis.

Master Student

October 2015 - October 2017

"Politehnica" University of Bucharest, Faculty of Applied Sciences, Bucharest, Romania

- R&D in in vitro evaluation of bone tissue engineering scaffolds.

Assistant Editor

July 2014 - October 2016

Letters of Applied NanobioScience, <https://nanobioletters.com>, Bucharest, Romania

- editing articles received for publication.

Intern

July 2014 - September 2014

Romanian Ministry of Health, Department for Projects Coordination and Implementation, Bucharest Romania

- Intern position in the 2nd edition of the Official Internship Program of the Romanian Government.

Laboratory Assistant

July 2012 - October 2014

"Politehnica" University of Bucharest, Faculty of Applied Sciences, Department of Physics, Digital Holography Laboratory, Bucharest, Romania

- preparation of biological samples for digital holographic microscopy; DHM image acquisition.

Intern

July 2013 - September 2013

IMA Medica, Bucharest, Romania

- skills in bacteriology techniques and Real time-polymerase chain reaction (RT-PCR) technique for diagnosis

Intern

July 2013 - September 2013

National Institute for R&D in Physics and Nuclear Engineering "Horia Hulubei", Department of Life and Environmental Physics, Magurele, Romania

- skills in cell culture techniques and different cellular and molecular biology methods for biomaterials or radiomineretic substances

Education

Doctor in Chemical Engineering

October 2016 - October 2020

"Politehnica" University of Bucharest, Doctoral School of the Applied Chemistry and Materials

Science Faculty, Department of Science and Engineering of Oxide Materials and Nanomaterials, Bucharest, Romania

- Title of the thesis: "Multifunctional nanohiomaterials" cumulative impact Factor - 50/314
- Excellent qualitative, *Summa cum laude* distinction
- 2 research grants awards to conduct research in international medical science universities

Master in Chemical Engineering

October 2014 - July 2016

"Politehnica" University of Bucharest, Applied Chemistry and Materials Science Faculty, Bucharest, Romania

- "Micro and nanomaterials" study program
- Title of the master thesis: "Pharmaceutical formulas with anti-tumour activity"
- knowledge and skills in specific methods for micro and nanofabrication and chemical synthesis, specific methods of characterization of micro and nanomaterials

Bachelor in Economy and International Affairs

October 2011 - July 2013 - October 2014 - July 2015

Bucharest University of Economic Studies, The Faculty of International Business and Economics, Bucharest, Romania

- Title of the bachelor thesis: "Europe 2020 - a new strategy of European Union for economic growth. Definition, development and challenges", knowledge in international trading and negotiation, international commerce, commerce policies, management, marketing, public relations, international commerce law.

Bachelor in Applied Engineering Sciences

October 2010 - July 2014

"Politehnica" University of Bucharest, Medical Engineering Faculty, Bucharest, Romania

- "Biomaterials and medical devices" study program.
- Title of the bachelor thesis: "Nanostructured materials with anti tumour applications"
- advanced knowledge and skills in biomaterials obtaining and characterisation, cellular and molecular biology, biophysics, basic medical knowledge, toxicology, basic knowledge in medical equipments and imaging techniques

Languages

Romanian (mother tongue), English (C1), German (A2), French (A2), Spanish (A2).

Other competences

- Driving license (B category)
- knowledge and skills in recycled rubber based nanocomposites, obtaining and characterisation
- good communication skills acquired through participating in many national and international symposiums and conferences; appreciation and understanding of cultural differences.
- scientific project management and planning
- Microsoft Office independent user
- basic knowledge in statistics using SigmaPlot, OriginPro

Courses

- Preparatory course in radioprotection 1st level (2019) at National Institute for R&D in Physics and Nuclear Engineering "Horia Hulubei", Nuclear Training Centre, Magurele, Romania.
- JRC Summer School on Alternative Approaches for Risk Assessment (2016) at Joint Research Centre, Ispra, Italy
- Introduction in Particle Physics (2015) at National Institute for R&D in Physics and Nuclear Engineering "Horia Hulubei", Nuclear Training Centre, Magurele, Romania
- HepTeth Symposium on Technological Transfer (2015), organised by CERN, Prague, Czech Republic.

Achievements

- 562 citations, *h-index*: 15 (Web of Science Researcher ID: AAE-4523-2019)
- 2 international research grants awarded
- 10 awards for scientific research presentations

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Curriculum Vitae

Ioana Fidel



Ioana-Ileana Fidel

Date of birth: 22/01/1997 | **Nationality:** Romanian | **Phone number:**

0000000000 (Mobile) | **Email address:**

Email address:

Address: Bărcănești, Crinilor, 141, Prahova, Romania (Home)

● **WORK EXPERIENCE**

31/03/2021 – 15/09/2023 Măgurele, Romania

PHYSICIST EXTREME LIGHT INFRASTRUCTURE - NUCLEAR PHYSICS (ELI-NP) / IFIN-HH

17/05/2020 – 30/03/2021 Măgurele, Romania

JUNIOR PHYSICIST EXTREME LIGHT INFRASTRUCTURE - NUCLEAR PHYSICS (ELI-NP) / IFIN-HH

11/2020 – 06/2021 Măgurele, Romania

STUDENT REPRESENTATIVE MASTER II IN THE FACULTY COUNCIL FACULTY OF PHYSICS

21/01/2020 – 30/11/2020 Măgurele, Romania

PRESIDENT PHYSICS STUDENTS ASSOCIATION OF UNIVERSITY OF BUCHAREST

31/10/2019 – 27/06/2021 Măgurele, Romania

STUDENT REPRESENTATIVE IN THE SENATE OF THE UNIVERSITY OF BUCHAREST FACULTY OF PHYSICS

27/10/2019 – 05/01/2020 Măgurele, Romania

INTERIM PRESIDENT PHYSICS STUDENTS ASSOCIATION OF UNIVERSITY OF BUCHAREST

10/2018 – 06/2019 Măgurele, Romania

STUDENT REPRESENTATIVE IN THE SENATE OF THE UNIVERSITY OF BUCHAREST FACULTY OF PHYSICS

04/2018 – 06/2021 Măgurele, Romania

VICEPRESIDENT PHYSICS STUDENTS ASSOCIATION OF UNIVERSITY OF BUCHAREST

06/2018 – 05/2019 Măgurele, Romania

PRACTICE FOR THE ELABORATION OF THE BACHELOR'S THESIS HORIA HULUBEI NATIONAL INSTITUTE FOR R&D IN PHYSICS AND NUCLEAR ENGINEERING (IFIN-HH)

06/2018 – 11/2018 Măgurele, Romania

STUDENT OBSERVER IN THE SENATE OF THE UNIVERSITY OF BUCHAREST FACULTY OF PHYSICS

01/2018 – 05/2020 Măgurele, Romania

AMBASSADOR OF THE "COMPLEX MAGURELE" DORMITORIES FACULTY OF PHYSICS

Project „University of Bucharest Student Swich Off”

16/09/2023 – CURRENT Măgurele, Romania

DOCTORAL RESEARCH ASSISTANT EXTREME LIGHT INFRASTRUCTURE - NUCLEAR PHYSICS (ELI-NP) / IFIN-HH

Department Biophysics and Biomedical Application Team, Laser Gamma Experiment Department

Website https://www.eli-np.ro/biophysics_lab.php

01/09/2023 – CURRENT Bucharest, Romania
RESEARCH ASSISTANT IN PHYSICS "C. D. NENITZESCU" - INSTITUTE OF ORGANIC AND SUPRAMOLECULAR CHEMISTRY

10/2017 – 11/2018 Măgurele, Romania
REPRESENTATIVE OF THE SECOND YEAR LICENSE FACULTY OF PHYSICS

- participation in the meetings and activities of the Faculty Council;
- active representation and support of students' interests;
- establishing, together with the head of the discipline, the examination dates, after the prior consultation of the students;
- ensuring a good communication between students and teachers, respectively administrative staff;
- informing students about any decision that directly concerns them

● EDUCATION AND TRAINING

30/09/2021 – CURRENT Bucharest, Romania
PHD. STUDENT Interdisciplinary School of Doctoral Studies, University of Bucharest

30/09/2019 – 27/06/2021 Romania
M.Sc. IN PHYSICS Faculty of Physics, University of Bucharest

Field of study Medical Physics |

Thesis Magnetic resonance methods in the study of the effects of ionizing radiation on biological systems

09/2016 – 06/2019 Romania
B.Sc. PHYSICS Faculty of Physics, University of Bucharest

Field of study Medical Physics |

Thesis The spectroscopic study of the interaction of model lipid membranes with the genistein flavonoid

Ploiești, Romania
HIGH SCHOOL DIPLOMA Colegiul Național „Mihai Viteazul”

● LANGUAGE SKILLS

Mother tongue(s): ROMANIAN

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C1	C1	C1	C1	C1
FRENCH	B1	B1	B1	B1	B1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

● DIGITAL SKILLS

Microsoft Word | Microsoft Excel | Microsoft Powerpoint | Google Drive | Social Media | Zoom | Microsoft Office | Google Docs | LinkedIn

● ADDITIONAL INFORMATION

COMMUNICATION AND INTERPERSONAL SKILLS

Public speaking Good communication skills acquired as a result of the activities carried out in the last years, due to the entrepreneurship competitions I participated in as well as the presentations I hold.

8 . Publications

The results of research during the **19 years of experience post-Ph.D. (22 years post-M.Sc.)**

- obtained financing as PI abroad: ‘Initiatives d’excellence’ and the French foundation of Medical Research ranked within the first 5 % of received projects; financed by the Swiss Fund National Found and ranked within the first 4%.
- articles as main author (corresponding author / first author contributions) have a cumulated impact factor **IF(main author) = 162**; for **corresponding-author contributions, cumulated IF = 125, mean value/article IF(corr. author) = 5.4**. Most of the papers published are in Q₁ journals (71 %). My publications accumulated 30.5 citations/paper. For some of the methods it takes time to become known in the chemistry, physics and biology communities linked to NMR, but once they start being used a large number of labs incorporate them. Importantly, even when for circumstances related to competition in a field that sees rapid development of methods and experimental devices we sought fast publication in journals with moderate advertising (e.g., MRC, JoVE 2016) our papers are cited by international experts at leading medical centres such as MD Anderson in Texas, Cancer Research Centre at Univ. Cambridge or the Harvard Medical School.
- **71 % Q1 papers, 87 % Q1+Q2 papers**. Selected Q1 papers published as corresponding author: JPCLett 2023, JPCLett 2022, JACS 2019, Progr NMR Spectroscopy 2019, Med. Phys. 2019, Sci. Rep. 2019, J. Chem. Phys. 2014, Chem. Commun. 2010, Phys. Rev. Lett. 2010, Angew. Chem. Int. Ed 2010, PNAS 2009, JACS 2009, ChemPhysChem 2008, JACS 2007.
- **Total number of citations: 2057 (Google Scholar), 1688 (Scopus) 1465 (Scopus, without self-citations); Average number of citations / paper 30.5 (Scopus, without self-citations) - age 46, 19 years of activity post-Ph.D.**

ELIGIBILITY CRITERION – CHAPTER V OF COMPETITION RULES

Selected team coordinator publications (PV- last 5 years) - only Q1 or Q2 papers the number is higher than the minimum required of 6 publications.

1. A. Topor, M. A. Voda, P. R. Vasos, "Earth's field NMR relaxation of pre-polarised water protons for real-time detection of free-radical formation" *Chem. Commun.*, 2023, 59, 11672-11675; <https://doi.org/10.1039/D3CC02502K>
2. F. Teleanu, A. Hanganu, C. Tuta, A. Saudet, M. A. Voda, P. R. Vasos, "Multiple Stroboscopic Detection of Long-Lived Nuclear Magnetization for Glutathione Oxidation Kinetics" *J. Phys. Chem. Lett.*, 2023, 14, 18, 4247–4251; <https://doi.org/10.1021/acs.jpcllett.2c03924>
3. F. Teleanu, A. Lupulescu, P. R. Vasos, "Selective Excitation of Long-Lived Nuclear Spin States" *J. Phys. Chem. Lett.* 2022, 13, 29, 6731–6736; <https://doi.org/10.1021/acs.jpcllett.2c01749>
4. F. Teleanu, A. Saudet, P.R. Vasos, "Symmetry versus entropy: Long-lived states and coherences" *Prog. Nucl. Magn. Reson. Spectrosc.*, 2021, 122, 63-75; <https://doi.org/10.1016/j.pnmrs.2020.12.002>
5. F. Teleanu, C. Tuta, A. Cucoanes, S. Vasilca, P. R. Vasos, "Magnetization Lifetimes Prediction and Measurements Using Long-Lived Spin States in Endogenous Molecules" *Molecules*, 2020, 25(23), 5495; <https://doi.org/10.3390/molecules25235495>
6. A. Sadet, R. Sarkar, F. Teleanu, G. Bodenhausen, P. R. Vasos, "Long-Lived Coherences", *Long-lived Nuclear Spin Order: Theory and Applications*, 2020; <https://doi.org/10.1039/9781788019972>
7. A. Sadet, V. Natasha, P. Ghenuche, P. R. Vasos, "Applications of Singlet Order to the Study of Biomolecules and Molecular Interactions" *Long-lived Nuclear Spin Order*, 2020, 248-265; <https://doi.org/10.1039/9781788019972>
8. A. Sadet, C. Stavarache, F. Teleanu, P. R. Vasos, "Water hydrogen uptake in biomolecules detected via nuclear magnetic phosphorescence" *Sci. Rep.*, 2019, 9, 17118; <https://doi.org/10.1038/s41598-019-53558-8>
9. T. Asavei, M. Bobeica, V. Nastasa, G. Manda, F. Naftanaila, O. Bratu, D. Mischianu, M. O. Cernaianu, P. Ghenuche, D. Savu, D. Stutman, K. A. Tanaka, M. Radu, D. Doria, P. R. Vasos, "Laser-driven radiation: Biomarkers for molecular imaging of high dose-rate effects" *Med. Phys.*, 2019, 46(10), 726-734; <https://doi.org/10.1002/mp.13741>
10. A. Sadet, C. Stavarache, M. Bacalum, M. Radu, G. Bodenhausen, D. Kurzbach, P. R. Vasos, "Hyperpolarized Water Enhances Two-Dimensional Proton NMR Correlations: A New

Approach for Molecular Interactions” J. Am. Chem. Soc. 2019, 141, 32, 12448–12452;
<https://doi.org/10.1021/jacs.9b03651>

Link to Paul R. Vasos’ publications:

https://scholar.google.com/citations?hl=en&user=cH3INW4AAAAJ&view_op=list_works&sortby=pubdate

Anexa 2. Fisa de selectare

FIȘA DE SELECTARE*

Rezultatele activității de cercetare ale candidatului din ultimii 5 ani
Se au în vedere următorii indicatori cantitativi de activitate: 1. lucrări în calitate de autor principal sau coautor încadrate cu tipul de document <i>article</i> , publicate în reviste indexate Web of Science JCR cuartila Q1 conform AIS (se ia în considerare ultima clasificare disponibilă în raport cu anul depunerii cererii) — minimum 7. În cazul științelor umaniste, publicarea a 4 cărți la edituri internaționale de prestigiu sau la edituri clasificate CNCS A; 2. clasare în top 1% după citări/Highly Cited Researcher in the field of (conform indexării Highly Cited Researchers™, Clarivate™)* — Da; 3. proiecte de cercetare naționale și internaționale, câștigate prin competiție, cu valoare de minimum 100.000 euro fiecare și echipă de minimum 3 membri, în calitate de director/conducător de proiect — minimum 1; 4. calitatea de cercetător/cadru didactic invitat la universități de prestigiu din străinătate — minimum 1**; 5. calitatea de editor-șef la o revistă indexată Journal Citation Reports — minimum 1; 6. scor de influență cumulat A, calculat după formula $A = \sum_{i=1}^n \frac{1}{n_i}$, unde n este numărul articolelor publicate de candidat în ultimii 5 ani, AIS _i reprezintă valoarea AIS al jurnalului în care este publicat articolul i (se ia în considerare ultima clasificare disponibilă în raport cu anul depunerii cererii) și n _i reprezintă numărul total de autori ai articolului i — A minimum 5***.
O cerere de premiere este selectată pentru etapa de evaluare calitativă dacă îndeplinește cel puțin 3 indicatori cantitativi de activitate dintre cei 6.

1. Articole publicate în Q1 conform AIS: **11 (> min. 7)** – see table below
2. Clasare în top 1% după citări conform Clarivate: Nu
3. Proiecte de cercetare castigate, minimum 100 kEuro fiecare, **director proiect: 3 proiecte**
PN-III-P4-ID-PCE2020-2642 – **calificativ realizare ‘Excelent’**,
PN-III-P2-2.1-364 PED-2019-4212 – **with Amethyst Radiotherapy**
PN-III-P4-ID-PCE-2016-0887 - **RESMAG-Hyperpol (completed in 2019)**
4. **Invited Professorship, Univ. of Vienna (Nov. 2023-Jan. 2024)**
 - Invited professor in the Biological Chemistry Institute (Prof. Dennis Kurzbach’s group) – several joint research projects started, abstract submitted jointly from the Bucharest and Vienna teams to Experimental Research Conference, US, joint article submitted.
 - A prior invitation was received in 2021 from the Univ. of Cambridge and led to obtaining a grant (SGS-ERC-RO-NO-2019-0010 *Preliminary experiments for defining hyperpolarised magnetic resonance in radiobiology*) for the invited professor position for 6 months in the Cancer Research Centre UK (Prof. Arnaud Comments’ group) – this was not completed due to COVID, the collaboration ongoing via a Bucharest-based project led by Prof. Arnaud Comment collaboration with University of Cambridge.
5. Editor-sef - no
6. **A= 9.41 (> min. 5)** – see table below.

Selected Team publications (last 5 years)

Article	Year	Impact Factor (IF)	Article Influence Score (AIS)	AIS Quart.
1. A. Topor, M. A. Voda, P. R. Vasos, "Earth's field NMR relaxation of pre-polarised water protons for real-time detection of free-radical formation" <i>Chem. Commun.</i> , 2023, 59, 11672-11675; https://doi.org/10.1039/D3CC02502K	2023	4.9	1.031	Q2
2. F. Teleanu, A. Hanganu, C. Tuta, A. Saudet, M. A. Voda, P. R. Vasos, "Multiple Stroboscopic Detection of Long-Lived Nuclear Magnetization for Glutathione Oxidation Kinetics" <i>J. Phys. Chem. Lett.</i> , 2023, 14, 18, 4247-4251; https://doi.org/10.1021/acs.jpcclett.2c03924	2023	5.7	1.544	Q1
3. F. Teleanu, A. Lupulescu, P. R. Vasos, "Selective Excitation of Long-Lived Nuclear Spin States" <i>J. Phys. Chem. Lett.</i> 2022, 13, 29, 6731-6736; https://doi.org/10.1021/acs.jpcclett.2c01749	2022	5.7	1.544	Q1
4. F. Teleanu, A. Topor, D. Serafin, A. Saudet, P. R. Vasos, "Rotating-Frame Overhauser Transfer via Long-Lived Coherences" <i>Symmetry</i> , 2021, 13(9), 1685; https://doi.org/10.3390/sym13091685	2021	2.7	0.406	Q3
5. F. Teleanu, A. Saudet, P. R. Vasos, "Symmetry versus entropy: Long-lived states and coherences" <i>Prog. Nucl. Magn. Reson. Spectrosc.</i> , 2021, 122, 63-75; https://doi.org/10.1016/j.pnmrs.2020.12.002	2021	9.4	2.835	Q1
6. A. Topor, D. Liu, C. Maxim, G. Novitchi, C. Train, Z. A. AlOthman, A. A. S. Al-Kahtani, L. Ungur, L. T. A. Ho, L. F. Chibotaru, M. Andruh, "Design of FeIII-LnIII binuclear complexes using compartmental ligands: synthesis, crystal structures, magnetic properties, and ab initio analysis" <i>J. Mater. Chem. C</i> , 2021, 9, 10912-10926; https://doi.org/10.1039/D1TC00894C	2021	8.06	1.163	Q2
7. Topor, D. Avram, R. Dascalu, C. Maxim, C. Tiseanu, M. Andruh, "Luminescence thermometry based on one-dimensional benzoato-bridged coordination polymers containing lanthanide ions" <i>Dalton Trans.</i> , 2021, 50, 9881-9890; https://doi.org/10.1039/D1DT01550H	2021	4.56	0.576	Q1
8. F. Teleanu, C. Tuta, A. Cucoanes, S. Vasilca, P. R. Vasos, "Magnetization Lifetimes Prediction and Measurements Using Long-Lived Spin States in Endogenous Molecules" <i>Molecules</i> , 2020, 25(23), 5495; https://doi.org/10.3390/molecules25235495	2020	4.4	0.659	Q2

9.	A. Sadet, C. Stavarache, F. Teleanu, P. R. Vasos, "Water hydrogen uptake in biomolecules detected via nuclear magnetic phosphorescence" <i>Sci. Rep.</i> , 2019, 9, 17118; https://doi.org/10.1038/s41598-019-53558-8	2019	3.99	1.129	Q2
10.	T. Asavei, M. Bobeica, V. Nastasa, G. Manda, F. Naftanaila, O. Bratu, D. Mischianu, M. O. Cernaianu, P. Ghenuche, D. Savu, D. Stutman, K. A. Tanaka, M. Radu, D. Doria, P. R. Vasos, "Laser-driven radiation: Biomarkers for molecular imaging of high dose-rate effects" <i>Med. Phys.</i> , 2019, 46(10), 726-734; https://doi.org/10.1002/mp.13741	2019	3.3	0.851	Q2
11.	A. Sadet, C. Stavarache, M. Bacalum, M. Radu, G. Bodenhausen, D. Kurzbach, P. R. Vasos, "Hyperpolarized Water Enhances Two-Dimensional Proton NMR Correlations: A New Approach for Molecular Interactions" <i>J. Am. Chem. Soc.</i> 2019, 141, 32, 12448–12452; https://doi.org/10.1021/jacs.9b03651	2019	14.6	4.061	Q1
12.	A. M. Onas, A. M. Pandeale, A. Hanganu, C. V. Florea, G. Marton, H. Iovu, M. D. Raicopol, L. Pilan, "Controlled surface functionalization using aryldiazonium salts with bulky protecting groups for the development of DNA-based sensing platforms", <i>Surf. Interfaces</i> , 2024, 46, 103855; doi.org/10.1016/j.surfin.2024.103855 .	2024	6.137	0.694	Q1
13.	T. Zhivkova, D. C. Culita, A. Abudalleh, L. Dyakova, T. Mocanu, A. M. Madalan, M. Georgieva, G. Miloshev, A. Hanganu, G. Marinescu, R. Alexandrova, "Homo- and heterometallic complexes of Zn(II), {Zn(II)Au(I)}, and {Zn(II)Ag(I)} with pentadentate Schiff base ligands as promising anticancer agents", <i>Dalton Trans.</i> , 2023, 52(35), 12282-12295; doi: 10.1039/d3dt01749d.	2023	4.569	0.576	Q1
14.	A. Bujor, A. Hanganu, V. Tecuceanu, A. M. Madalan, M. Tudose, L. Marutescu, M. Popa, C. M. Chifiriuc, I. Zarafu, P. Ionita, "Biological Evaluation and Structural Analysis of Some Aminodiphenylamine Derivatives", <i>Antioxidants</i> , 2023, 12, 713; https://doi.org/10.3390/antiox12030713 .	2023	7.67	0.945	Q1
15.	M. Ivanova, A. Hanganu, R. Dumitriu, M. Tociu, G. Ivanov, C. Stavarache, L. Popescu, A. Ghendov-Mosanu, R. Sturza, C. Deleanu, N. A. Chira, "Saponification Value of Fats and Oils as Determined from ¹ H-NMR Data: The Case of Dairy Fats", <i>Foods</i> , 2022, 11, 1466; https://doi.org/10.3390/foods11101466 .	2022	5.2	0.642	Q2
16.	A. Hanganu, N. A. Chira, "When detection of dairy food fraud fails: An alternate approach through proton nuclear magnetic resonance spectroscopy", <i>J. Dairy Sci.</i> , 2021, 104 (8); https://doi.org/10.3168/jds.2020-19883 .	2021	4.22	0.614	Q1
17.	A. G. Coman, A. Paun, C. C. Popescu, N. D. Hädade, A. Hanganu, G. Chiritoiu, I. C. Farcasanu, M. Matache, "A novel adaptive fluorescent	2019	4.83	0.68	Q1

probe for cell labelling”, <i>Bioorg. Chem.</i> , 2019, 92, 103295; https://doi.org/10.1016/j.bioorg.2019.103295 .				
18. Ş. Chiriac, R. C. Popescu, M. M. Pele, C. D. Ghiţulică, A. Cucuruz, R. E. Geanaliu-Nicolae, I. C. Stancu, G. Voicu, L. T. Ciocan, “New 3D Printed Scaffolds Based on Walstromite Synthesized by Sol–Gel Method” <i>J. Funct. Biomater.</i> , 2024, 15(1): 19; DOI: 10.3390/jfb15010019.	2024	4.8	0.752	Q2
19. R. C. Popescu, B. Ş. Călin, E. Tănasă, E. Vasile, M. Mihăilescu, I. A. Păun, „Magnetically-actuated microcages for cells entrapment, fabricated by laser direct writing via two photon polymerization” <i>Front. Bioeng. Biotechnol.</i> , 2023, 11: 1273277; DOI:10.3389/fbioe.2023.1273277	2023	6.064	1.005	Q2
20. T. Mihaela, R. C. Popescu, R. D. Negoită, A. Gilbert, M. A. Ilişanu, T. Mihaela, A. Dinischiotu, F. Chevalier, M. Mihăilescu, D. Savu, “In vitro hyperspectral biomarkers of human chondrosarcoma cells in nanoparticle-mediated radiosensitization using carbon ions” <i>Sci. Rep.</i> , 2023, 13(1): 14878; https://doi.org/10.1038/s41598-023-41991-9	2023	4.997	1.129	Q2
21. C. Chircov, I. A. Dumitru, B. S. Vasile, O. C. Oprea, A. M. Holban, R. C. Popescu, “Microfluidic Synthesis of Magnetite Nanoparticles for the Controlled Release of Antibiotics” <i>Pharmaceutics</i> , 2023, 15(9): 2215; DOI:10.3390/pharmaceutics15092215	2023	6.525	0.754	Q2
22. R. C. Popescu, V. Kopatz, E. Andronescu, D. I. Savu, W. Doerr, “Nanoparticle-Mediated Drug Delivery of Doxorubicin Induces a Differentiated Clonogenic Inactivation in 3D Tumor Spheroids In Vitro” <i>Int. J. Mol. Sci.</i> , 2023, 24(3): 2198; DOI:10.3390/ijms24032198.	2023	5.6	1.028	Q2
23. M. Tudose, D. C. Culita, R. D. Baratoiu-Carpen, R. A. Mitran, A. Kuncser, C. Romanitan, R. C. Popescu, D. I. Savu, “Novel Antitumor Agents Based on Fluorescent Benzofurazan Derivatives and Mesoporous Silica” <i>Int. J. Mol. Sci.</i> , 2022, 23(24): 15663; DOI:10.3390/ijms232415663	2022	5.6	1.028	Q2
24. A. M. Croitoru, A. Moroşan, B. Tihăuan, O. Oprea, L. Motelică, R. Truşcă, A. I. Nicoară, R. C. Popescu, D. Savu, D. E. Mihăiescu, “Novel Graphene Oxide/Quercetin and Graphene Oxide/Juglone Nanostructured Platforms as Effective Drug Delivery Systems with Biomedical Applications” <i>Nanomaterials</i> , 2022, 12, 11:1943; https://doi.org/10.3390/nano12111943	2022	5.3	0.707	Q2
25. I. A. Păun, B. S. Calin, R. C. Popescu, E. Tanasa, A. Moldovan. “Laser Direct Writing of Dual-Scale 3D Structures for Cell Repelling at High Cellular Density” <i>Int. J. Mol. Sci.</i> , 2022, 23, 6, 3247; https://doi.org/10.3390/ijms23063247	2022	5.6	1.028	Q2
26. R. C. Popescu, D. I. Savu, M. Bierbaum, A. Grbenicek, F. Schneider, H. Hosser, B. S. Vasile, E. Andronescu, F. Wenz, F. A. Giordano, C. Herskind, M. R. Veldwijk “Intracellular Delivery of Doxorubicin by Iron Oxide-Based Nano-Constructs Increases Clonogenic Inactivation of Ionizing	2021	6.208	1.028	Q2

Radiation in HeLa Cells” Int. J. Mol. Sci., 2021, 22(13): 6778; DOI: 103390/ijms22136778				
27. R. C. Popescu, D. Savu, I. Dorobantu, B. S. Vasile, H. Hossler, A. Boldeiu, M. Temelie, M. Straticiu, D. Iancu, E. Andronescu, F. Wenz, F. Giordano, C. Herskind, M. R. Veldwijk, “Efficient uptake and retention of iron oxide-based nanoparticles in HeLa cells leads to an effective intracellular delivery of doxorubicin” Sci. Rep., 2020, 10(1): 10530; DOI:10.1038/s41598-020-67207-y	2020	4.379	1.129	Q2
28. R. C. Popescu, M. Straticiu, C. Mustaciosu, M. Temelie, R. Trusca, B. S. Vasile, A. Boldeiu, D. Mirea, R. F. Andrei, C. Cenusu, L. Mogoanta, G. D. Mogosanu, E. Andronescu, M. Radu, M. R. Veldwijk, D. I. Savu, “Enhanced Internalization of Nanoparticles following Ionizing Radiation Leads to Mitotic Catastrophe in MG-63 Human Osteosarcoma Cells” Int. J. Mol. Sci., 2020, 21(19), 7220; DOI:10.3390/10.3390/ijms21197220	2020	5.923	1.028	Q2
29. A. I. Visan, G. Popescu-Pelin, O. Gherasim, V. Grumezescu, M. Socol, I. Zgura, C. Florica, R. C. Popescu, D. Savu, A. M. Holban, R. Cristescu, C. E Matei, G. Socol, “Laser processed antimicrobial nanocomposite based on polyaniline grafted lignin loaded with Gentamicin-functionalized magnetite” Polymers, 2019, 11 (2): 283; DOI: 10.3390/polym11020283.	2019	3.426	0.604	Q1
30. S. Vasilca, I. Petroviciu, C. D. Negrut, M. Virgolici, F. Albu, A. Medvedovici, “Supramolecular solvent based method for natural dyes extraction from fibers and holistic chemometric approaches used for assessing induced gamma irradiation’s effects: A comprehensive study by LC-DAD-MS analysis” Microchemical J., 2023, 189(5), 108568; DOI: 10.1016/j.microc.2023.108568	2023	5.304	0.590	Q2
31. A. L. Mateescu, N. B. Mincu, S. Vasilca, R. Apetrei, D. Stan, B. Zorila, D. Stan, “The influence of sugar–protein complexes on the thermostability of C-reactive protein (CRP)” Sci. Rep., 2021, 11(1), 13017; DOI: 10.1038/s41598-021-92522-3	2021	4.996	1.129	Q2
			A	11 Q1 19 Q2
			9.408	

The cumulated Article Influence Score for the team for the last 5 years was calculated as the sum of the team members scores accumulated from team publications, in the following manner:

$$A (\text{team}) = 3.252 (\text{P. Vasos}) + 0.601 (\text{M. Voda}) + 2.139 (\text{A. Sadet}) + 1.377 (\text{R. Popescu}) + 0.397 (\text{S. Vasilca}) + 0.941 (\text{A. Hanganu}) + 0.623 (\text{A. Topor}) + 0.078 (\text{D. Serafin}) = 9.41$$

9 Projects granted

Paul Vasos has

- 14 financed grants as PI or partner – total amount of ca 5.5 MEur
- 7 financed grants as PI – total amount of ca 1.5 MEur
- PN-III-P4-ID-PCE2020-2642 "Water hyperpolarization for radiation biomarker detection", ca **250 kEur**
- PN-III-P2-2.1-364 PED-2019-4212 545 PED/2020 Experiments and devices for free-radical and biomarker detection, ca **150 kEur (in collaboration with the clinic – Amethyst Radiotherapy)**
- PN-III-P4-ID-PCE-2016-0887 - **RESMAG-Hyperpol (completed in 2019)**
- **PI Storing slow processes in spin memory: long-lived states** - 250 kEUR Swiss National Science Foundation (SNSF) and EPFL; **2014 – 2016: PI Enhanced nuclear magnetic resonance to follow biomolecules in complex environments: NMR@Com** - 300 kEur IdEx (*Initiatives d'Excellence*, French Research Ministry); **2013 – 2015: PI Polarisation nucléaire dynamique (DNP) et dissolution suivies par électroporation et RMN** - 100 kEur (Fondation pour la Recherche Médicale) ; **2012 – 2015: PI Longues durées de vie de l'aimantation et hyperpolarisation pour études RMN dans la cellule** - 70 kEur (DIM Analytics Reg Ile de France); **2011: ERC phase II project (fundable project – first 20 %)**; **2015 – 2016 : Hubert Curian Partnership, PHC BRANCUSI**

As Partner

- ELI_09/01.10.2020 "CELLI - Advanced biological methods for the detection of normal and pre-leukemic cells' response after FLASH irradiation at ELI-NP" – PI Gina Manda, Inst. V. Babes
- PNRR- Magnetic resonance in radiobiology experiments with cancer and immune cells
PI Arnaud Comment, GE Healthcare, University of Cambridge
- PN-III-P1-1.1-PD2019-0778 "Propolis extracts effects on biomimetic lipid membranes"
PI B. Zorila, Supervision P. Vasos

Partner in projects developed abroad

- French Equipex 'Paris en Resonance' (2 MEur, Sorbonne Universites, G. Bodenhausen et al., 2011) – PV-led team one of the 10 members
- French Equipex CACSICE 2MEur, Sorbonne Paris Cite, F. Dardel et al., 2012- PV-led team of 7 members

- IdeEx, Swiss National Science Foundation (Bodenhausen and Vasos, 2008) Swiss Commission for Technology and Innovation (Bodenhausen, Vasos, Dyson and Ansermet, 2009, 250 kEur) <100 kEur, partner: EUROHyperpol, PHC Brancusi, EU COST.

10 Patents (of which six describe three developments patented both in the US and the EU),
first author in 5 patents

EP 2 270 531 P. Vasos, A. Comment, R. Sarkar, S. Jannin, G. Bodenhausen

EP 2 270 532, P. Vasos, A. Comment, R. Sarkar, S. Jannin, G. Bodenhausen

EU Patent: EP1879039, G. Bodenhausen, R. Sarkar, P. Vasos

US Patent 8456162, P. Vasos, A. Comment, R. Sarkar, S. Jannin, G. Bodenhausen

US Patent 8362770, P. Vasos A. Comment, R. Sarkar, S. Jannin, G. Bodenhausen

US Patent 7626386, G. Bodenhausen, R. Sarkar, P. Vasos,

RO OSIM A00326/2021, A. Sadet, F. Teleanu, P. Vasos

RO OSIM A100144/2023, P. Vasos, M. A. Voda, A. Topor

CITATIONS- 10 examples of citations of our publications and patents by prestigious academic groups in the field and companies. **The total number of citations for PV articles is 2150 (Google Scholar), 1800 (Scopus) 1600 (Scopus, without self-citations); Average number of citations / paper > 32 (Scopus, without self-citations) - age 46, 19 years of activity post-Ph.D.**

- 1) **Proc. Nat. Acad. Sci. USA 2020**, by Novakovic, Schwalbe, al., and Frydman, 10.1073/pnas.1916956117 ('support citation', according to Web of Science), --> *citing Sadet, al., and Vasos*, J. Am. Chem. Soc., 2019, as new solution for 2D d-DNP NMR.*
- 2) J. Kowalewski's book "**Nuclear spin relaxation**", **Royal Society of Chemistry 2020**--> *cites Sadet, al., and Vasos* J. Chem. Phys. 2014, Long-lived coherences: Improved dispersion in the frequency domain using continuous-wave and reduced-power windowed sustaining irradiation*
- 3) **Nature Protocols 2022**, by Hilty et al., Nature Protocols, 10.1038/s41596-022-00693-8 *cites Sadet, al., and Vasos*, JACS 2019 as key data used in the protocol*
- 4) **Commun. Chem. 2021**, by M.Negroni et al, 10.1038/s42004-021-00587-y ('support citation', Sciteai)--> *cites Sadet, al., and Vasos*, J. Am. Chem. Soc. 2019 for substantially-improved signal intensity in NMR*
- 5) **Angew. Chem. Int. Ed. 2019**, Yang, al., and Glogglar, 10.1002/anie.201814198 ('support citation', Sciteai) → *cites C Stavarache, al., and P. Vasos*, Journal of Magnetic Resonance 284, 15-19*
- 6) **Phys. Chem. Chem. Phys.**, by Korenchan, Lu, Levitt et al. 2021 ('support citation', Sciteai)--> *cites Teleanu, Sadet and Vasos*, Progress in Nuclear Magnetic Resonance Spectroscopy as a comprehensive review of progress in the field*
- 7) **Front. Phys. 2021**, by Chaundray, al., and Borghesi, 10.3389/fphy.2021.624963 ('support citation', Web of Science)--> *cites Med Phys 2019, Asavei, al., and Vasos* for ELI-Nuclear Physics (ELI-NP) Romania, involvement in laser-driven ion radiobiology research*
- 8) **Journal of Nanobiotechnology 2023**, by Liu, al., and Chen, 10.1186/s12951-023-01825-2 ('support citation', Web of Science)--> *cites Med. Phys. 2019, Asavei, al., and Vasos* for proposed methods relevant for radiation therapy*
- 9) **US Patent US9804239B2** by Walsworth, DeVience, Rosen at **Harvard Univ. Biomed. Imaging** on 'Nuclear singlet states as a contrast mechanism for NMR spectroscopy' → *cites US Patent 8,456,162 by Vasos, Comment, et al., Methods for nuclear magnetic resonance (NMR) or magnetic resonance imaging (MRI) measurements using long-lived states (LLS)*
- 10) **US Patent US9568574B2** by Struppe and Mueller, **Bruker Biospin** on 'Pulse sequence for homonuclear J-decoupling during NMR data acquisition' → *cites US Patent 8,362,770 by Vasos, Sarkar, et al., Method for nuclear magnetic resonance (NMR) spectroscopy measurements using long-lived coherences (LLC's)*

Paul R. Vasos – Team Coordinator - main achievements of the last 5 years:

As the coordinator of the *Biophysics and Biomedical Applications group and laboratory at ELI-NP* I transfer know-how from the experience acquired in France (Group Coordinator and University Professor at Paris-V Biomedical College), Switzerland (Swiss National Fund Fellow, young group coordinator), US Univ. of Maryland and Italy Univ. of Florence (**International Ph.D. in Structural Biology** awarded jointly with Univ. of Utrecht and Univ. of Frankfurt).

Our group has emerged from the implementation phase and equipment installation period as a **young team (average age = 33 years)** including 5 Ph.D. students (of whom 3 supervised exclusively by PV at the University of Bucharest, ISDS), and 2 undergraduate students (one B.Sc., Univ. Bucharest, one M.Sc., UMF Carol Davila), with a modern laboratory, including unique state-of-the-art equipment (invented in 2003) in South and Eastern Europe for sensitive diagnostic via hyperpolarised magnetic resonance (https://www.eli-np.ro/biophysics_lab.php) using Dynamic Nuclear Polarisation (installed at ELI-NP in december 2023).

Our team's recent research **materialized in a trail of papers describing research** I coordinated as **corresponding author**, of which several have had resounding impact, thus contributing to consolidate our group: *J. Am.Chem.Soc.* 2019 (Impact Factor ca 17), *Sci. Rep.* 2019, *Med. Phys.* 2019, *Progr. in Nucl. Magn. Reson. Spectrosc.* 2021 (Impact Factor ca 10), *J.Phys.Chem.Lett.* 2022 (Impact Factor ca 7), *Chem. Commun.* 2023, *J.Phys.Chem.Lett.* 2023 (Impact Factor ca 7), book chapters (**2 book chapters published by the Royal Society, UK**, in 2020) as well as patents (OSIM A00326/2021; A100144/2023). Our papers are cited by international experts at leading medical centres such as MD Anderson in Texas, Cancer Research Centre at Univ. Cambridge or the Harvard Medical School.

The careers of group members I coordinated in the period 2019-2023 rapidly advanced to **international level: grants received by students and former students include mobility grants** for experimental campaigns and training in the US (**Fulbright Grants 2023 – 2 Ph.D. students**), at MDPI Goettingen (**DAAD scholarship, F. Teleanu**) and at the Univ. of Florence (**iNext-Discovery for Structural Biology, Univ. of Florence** to F. Teleanu for a 1-week experiment at 750 MHz and Ph.D. training grants for A. Ciumeica and I. Fidel for a summer school at the Univ. of Florence).

Projects I managed during the period 2019-2023 include **3 financed projects as PI and other 2 as partner (ca 2 MEur), namely** PN-III-P4-ID-PCE2020-2642 – graded with '*Excellent*' in terms of accomplished proposed achievements, PN-III-P2-2.1-364 PED-2019-4212 – in collaboration with **Amethyst Radiotherapy**, PN-III-P4-ID-PCE-2016-0887 - **RESMAG-Hyperpol (completed in 2019)**, and experimental project **iNEXT Structural Biology – NMR time at 950 MHz, Univ. of Florence. As partner: PNRR – Highly Qualified Human Resources** - with Arnaud Comment, Univ. Cambridge and coordinator of DNP-NMR imaging at **General Electric Healthcare, Cambridge UK, ELI-RO ('CELLI') – with Inst. V. Babes**, and other projects (post-doctoral scholarships, mobility grant).

International positions of trust reflecting visibility include: since 2019 **Member of the Committee of the Ampere Society**, largest Magnetic Resonance society in EU, organiser of Euromar, other European conferences and PhD schools (re-elected to the Committee by the vote in the General Assembly in september 2023 for the period 2023-2027).

International Visibility: journal interview in *Bulletin of the Ampere Society*, 2022 (researcher profile), *recent high-profile presentations:* Univ. Vienna, invited presentation (2024), semester course 2023-2024 (invited professor); **Experimental NMR Conference California**, San Francisco 2023 (selected), **Diaspora Timisoara 2023** (invited), **University of Florence Chemistry Doctoral School** (invited, 2023), invited, University of Split, Croatia 2022 (invited), ELI summer school 2022 (invited), **Euromar Glasgow**, UK 2022 (selected); **Ph.D. and postdoc coordination** since 2019: **Ph.D. students:** F. Teleanu (since 2020), I. Fidel (since 2021), A. Ciumeica (since 2022) (Interdisciplinary Ph.D. School, Univ. of Bucharest); **Post-doctorates:** Dr V. Nastasa, Dr Th Asavei, Dr A. Sadet (2017-2019 Univ. Bucharest and ELI-NP) **MSc, BSc students:** I. Fidel., A. Ciumeica, D. Serafin, O. Ianc (University of Bucharest, Faculty of Physics, UMF 'Carol Davila' Bucharest).

Full CV

1. Degrees and Diplomae:

2000 – 2004: University of Florence, Ph.D. in Structural Biology (International Ph.D. awarded jointly with the Univ. of Frankfurt and Univ. of Utrecht).

Ph.D. thesis: Physical methods for the study of the structure and stability of macromolecules: development of new NMR approaches and applications to metalloproteins, University of Florence, (Prof. I. Bertini, Prof. C. Luchinat, Prof. I. Felli)

Training period at the Univ. of Utrecht (2003) – Prof. R. Boelens and Prof. A. Bonvin

1995 – 2000 University of Bucarest Master in Physics of Atoms and Molecules

MSc-2 thesis: Structural modelling of Fe₂S₂ ferredoxins: an analysis of fold and function, University of Bucharest and University of Florence, 2001 (Prof. I. Bertini, Prof. C. Luchinat, Prof. A. Rosato)

MSc-1 thesis: Etude du dépliement de la beta-lactoglobuline par RMN, Joseph Fourier University, Grenoble, University of Bucharest (Prof. V. V. Grecu, Prof. C. Palivan, Prof. J.-P. Cohen-Addad)

2. Professional activity:

2016 – present: Extreme Light Structure Nuclear-Physics (ELI-NP), senior researcher, research team coordinator: **Biophysics and biomedical applications laboratory and group:** 3 junior researchers, 1 technician, 3 Ph.D. and 2 M.Sc. students;

University of Bucharest, Interdisciplinary Ph. D. School, Professor of Chemistry, Ph.D. advisor

2010 – 2016: Paris Descartes University (Paris-V, now Univ. Paris Cité), Professor of Chemistry

Research team coordinator: research team composed of 2 Maitres de Conférences, 1 Research Engineer (half-time), a CNRS researcher (half-time), Post-Doc., PhD and MSc students;

Coordinator of the Master-2 Program in *Spectroscopy towards Life Sciences*, Paris Descartes; Teaching and coordination of teaching at various levels : Licence 2, MSc 1,2 (200h teaching /yr)

2008 – 2011: Ecole Polytechnique Fédérale de Lausanne : Senior Researcher (and lecturer at BSc-2 and PhD level) with independent funding (Ambizione – Swiss National Science Foundation)

2005 – 2008: Ecole Polytechnique Fédérale de Lausanne (EPFL): Post-doctorate

2004 – 2005 : University of Maryland (College Park, Washington, DC) Post-doctorate

Spoken languages: English (fluent), French (fluent), Italian (fluent), Greek (notions)

2.1 Project Management: - 14 financed projects as PI or partner (ca 5.5 MEur)

- 7 projects as Principal Investigator (ca 1.5 MEur)

Selected: 2008 – 2011: PI *Storing slow processes in spin memory: long-lived states* - 250 kEUR Swiss National Science Foundation (SNSF) and EPFL; **2014 – 2016: PI *Enhanced nuclear magnetic resonance to follow biomolecules in complex environments: NMR@Com* - 300 kEUR IdEx (*Initiatives d'Excellence*, French Research Ministry); **2013 – 2015: PI *Polarisation nucléaire dynamique (DNP) et dissolution suivies par électroporation et RMN* - 100 kEUR (Fondation pour la Recherche Médicale) ; **2012 – 2015: PI *Longues durées de vie de l'aimantation et hyperpolarisation pour études RMN dans la cellule* - 70 kEUR (DIM Analytics Reg Ile de France); **2011: ERC phase II project (fundable project – first 20 %); **2015 – 2016 : Hubert Curian Partnership, PHC BRANCUSI**********

Partner in projects: (between 250 kEUR and 2.5 MEur) French Equipex, IdeEx, Swiss National Science Foundation, Swiss Commission for Technology and Innovation, EUROHyperpol, PHC Brancusi, EU COST.

2.2 Scientific Coordination:

Post-doctorates: Dr V. Nastasa, Dr Th Asavei, Dr A. Sadet (2017-2019 Univ. Bucharest and ELI-NP), Dr R. Balzan (2013–2016, Université Paris Descartes), **Ph.D. students:** F. Teleanu (since 2020), I. Fidel (since 2021), A. Ciumeica (since 2022), L. Fernandes (2012–2015)- currently at Ipheos, R. Sarkar (2006-2010)–currently engineer, Univ. Munchen, P. Ahuja (2007-2011)–currently at AstraZeneca (co-supervision with G. Bodenhausen); **MSc, BSc students:** D. Serafin, O. Ianc (UniBuc) Z. Wang, A. Sadet, C. Guerniou (Paris-V), A. Bornet, L. Angue (EPFL)

Committees (selected): selection of a Professor in Chemistry (Univ. Babes-Bolyai); PhD and HDR theses committees: EPFL 2010 (Biomolecular Imaging); Univ. le Mans 2012 (NMR methods); ESPCI 2015 (Dynamic Nuclear Polarisation, 'Habilitation' thesis).

2011-2014 Biomedical School representative in the Paris V Committee for Certification of PhD supervisors ('Habilitation') in Basic Sciences, Engineering, and Life Sciences;

2.3 Honours and prizes:

2023: Invited Professorship, Univ. of Vienna (semester Oct. 2023-Jan. 2024); **2019:** Romanian Academy Award *N. Teclu*; **2010:** Nominated for the Latsis prize, EPFL; **2008 - 2011:** Awarded the 'Ambizione' SNCF – Elvetia; **2002 – 2004:** Young Scientist European Scholarship; **1995 – 2000:** Merit scholarship of the Romanian State (renewed each semester for top 5% students)

Grants awarded to supervised Ph.D. students and post-docs: national grant for in-cell NMR Ph.D. school (I. Fidel, 2023); grant for participating at the Univ. Florence Ph.D. school on in-cell NMR (A. Ciumeica, 2023), Fulbright scholarship to New York University 2023 (F. Teleanu), iNext high-field NMR measurement campaign (F. Teleanu, 2022), young research ELI-NP competition (silver medal D. Serafin, 2023, bronze medal F. Teleanu 2022), nomination for Varian award at ENC California 2019 (A. Sadet), post-doctoral fellowship by IdEx (R. Balzan, 2012-2015); Ph.D. scholarship by the Fondation Medicale, France (L. Fernandes, 2011-2014)

3. Scientific communication, representation:

> 30 oral presentations (15 invited, 3 keynote lectures), of which:

Univ. Vienna, NMR for biomolecular kinetics - one semester course 2023-2024 (invited professor); ENC California, 2023 (selected), Diaspora Timisoara 2023 (invited), Univ. Florence Chemistry Doctoral School (invited, 2023), Euromar 2022 (selected), Univ. of Split 2022 (invited), Nuclear Photonics 2018 (invited), RICCE 2017 (invited keynote); Magn. Moments Centr. Europe (MMCE), Vienna 2012 (invited keynote), Univ. Southampton 2015 (invited), Univ. Basel 2014 (invited), Biopolymers, Nove Hradky 2011 (invited), NMR of Biological Solids, Paris 2011 (invited); Colloque de la Section de Physique, EPFL, March 2010 (invited); ENC 2010 Florida, USA (selected), Joint Euromar and Ismar Conference 2010 (invited); Protein NMR Advanced School GIDRM, Univ. Torino, 2009 (invited); Gordon Conference Biddeford, ME 2009 (invited).

Reviewer and editorial activity: reviewer of projects for ERC starting grants and for various national foundations, Editor for Physical Chemistry and Chemical Physics,

Frontiers in Chemistry reviewer for: American Chemical Society, Royal Society of Chemistry, Elsevier.

Journal interview: Bulletin of the Ampere Society, 2022, Researcher profile

Since 2019: **Member of the Committee of the Ampere Society**, largest Magnetic Resonance society in EU, organiser of Euromar, other European conferences and PhD schools (re-elected to the Committee position by the General Assembly in september 2023 for the period 2023-2027);

Mihai Adrian VODĂ

I am a physicist with a Ph.D. degree in Science (Dr. rer. nat.) obtained at RWTH University of Aachen, Germany (2006).

I joined the Biophysics and Biomedical Application group at ELI-NP (IFIN-HH) in 2021 after eleven years of research&development at Unilever Netherlands (2008-2019).

Work experience

2021-current: Research Scientist at ELI-NP, conducting research for implementing magnetic resonance methods for novel applications in biomedical field, with important impact on developing the mechanistic understanding of radiation biomarkers for cancer treatment and the toxicity effect at molecular level.

2008-2019: Science Leader spectroscopy & microstructure, R&D manager, Project Leader at Unilever R&D, The Netherlands. I lead cross-functional teams to enable product innovation and development in R&D projects related to foods, beverages, home and personal care business.

Achievements (last 5 years)

I co-authored a publication in *J.Phys.Chem.Lett.* 2023, 14, 18, 4247–4251 where new spectroscopic time-scales were rendered accessible by our team's research in long-lived nuclear spin order – long lived states (LLS) and long lived coherences (LLC's), which extends the observation timescale of various chemical and biological processes by using proton singlet states with longer life times. LLS were recently adapted to study in real-time biochemical transformations of key metabolites such as glutathione, extending the magnetisation relaxation time constants to tens of seconds, while the standard signal relaxation is on the order of one second.

I co-authored a publication in *Chem. Commun.*, 2023, 59, 11672-11675 where we implemented a magnetic resonance method using Earth's magnetic field to detect paramagnetic species, including free radicals, in water solutions.

I am co-author of a Romanian patent, RO OSIM A100144/2023, P. Vasos, M. A. Voda, A. Topor.

I co-authored a publication in *Analytical Chemistry*, 2020/2/13, where we brought a major improvement to the rheo-microMRI velocimetry technique at a high magnetic field with strong pulsed field gradients, which we developed earlier and implemented to study fats behaviour under factory-relevant processing conditions (shear, temperature, composition).

I co-authored a publication in *Langmuir*, 2019/1/14, where a detailed investigation was carried out on the modulation of the coupling between network formation and the recrystallization of oil-dispersed micronized fat crystal nanoplatelets by varying oil composition, shear, and temperature.

I have co-authored 28 publications, 2 of them having more than 150 citations. H-Index 13.

Aude SADET

Projects developed in Romania: Detection of biomolecular interactions via standard-polarization and 2D hyperpolarized Nuclear Magnetic Resonance (NMR) spectroscopy

At the University of Bucharest and the Extreme Light Infrastructure at the Institute of Nuclear Physics (ELI-NP, IFIN-HH), my project was to introduce modern NMR developments to improve the sensitivity of molecular detection. With a group of young scientists at the University of Bucharest and ELI-NP we developed molecular biomarkers for hyperpolarized Magnetic Resonance using amino acids and peptides. I submitted our findings as corresponding author to *Faraday Discussions* (2018): a **new method** to monitor water proton transport through membrane channels via exchange with biomolecules by Hyperpolarised NMR. I gave an **invited talk at the Faraday Discussions: Membranes and artificial water channels (Glasgow 2018)** to present these results.

I demonstrated, using long-lived coherent superpositions of singlet and triplet states of nuclear spins (LLC's), that **spin order can be transferred from water to peptides**. I published a paper describing these results as main author in *Scientific Reports*, 2019. I gave an **oral presentation at the Experimental Nuclear Resonance Conference (ENC), Asilomar California, 2019**.

I created a **new method** to acquire structural information within 1 min by hyperpolarised 2D NMR correlation spectroscopy. With this method, we characterized peptide-membrane interactions. The 2D method I proposed, using water (HDO) as a vector of hyperpolarized magnetisation, can also be applied for drug screening (published this new method as first author, A. Sadet et. al. *J.Am. Chem. Soc.* 2019 (Impact Factor = 15.42)). Since 2019, this method was used and cited by 20 laboratories. The project thus contributed to the emergence of a new, more-sensitive, molecular characterisation via sensitivity-enhanced 2D Magnetic Resonance that will be used steadily in analytical chemistry.

Thanks to these 2 last works, I was **nominated for the Varian Price** at the Experimental Nuclear Resonance Conference, California, 2019.

After 2019, I was on **maternity and childcare leave** for 4 years.

Cătălin Tută

Scientific Researcher grad III, PhD (2006) which in previous scientific activities was involved in different research activities such as:

- Developing the analytical methods for labelled compounds using general and specific analytical methods; HPLC, Ion Chromatography, Radio-TLC, TLC, UV-VIS, FTIR, NMR, ESR.
- Participation at research projects covering areas of expertise in synthesis and characterization of labelled compounds with radioactive isotopes.
- Application of labelled compounds in field of life science. Development of analytical method for determination of fluoride anion using electrochemical methods. ■
- Implementation of QA System in Laboratory of Research and Development of Radiolabelled Compounds.
- Consulting regarding HPLC separation of Amino Acids extracted from Bone Collagen to dating the archaeometric samples using AMS technique.
- QC/QA using Alanine – EPR Spectrometry Dosimetric System in Medical Radiosurgery.

As of the present time, the scientific activities are in different fields such as chemistry, dosimetry and forensic. He offers the technical support for sample preparation for forensic probes. For manipulation of radioactive sources, he is qualified with the National Clearance License level 2 for opened and sealed radioactive sources and he is the **Security Officer Responsible** for IFIN-HH Metrology Laboratory.

In the last 5 years the research activities were published in the following articles:

1. Titanium Hydrides with Controlled H/T Ratio for AMS Facility Calibration
Postolache, C.; Antohe, A.; Tuta, C. S.; Bubueanu, G.; Ioan, M. R. (5 autori)
FUSION SCIENCE AND TECHNOLOGY, 2020, 76(3), 202-208,
10.1080/15361055.2019.1704109
2. Radiological Characterization of the Resulting Solid Materials from the Refurbishment of the Tritium Laboratory
Fugaru, Viorel; Bubueanu, George; Tuta, Catalin Stelian; Ioan, Mihail-Razvan (4 autori)
FUSION SCIENCE AND TECHNOLOGY, 2020, 76(3), 347-350,
10.1080/15361055.2020.1712008
3. The Area Measurements in the Tritium Laboratory Within Nipne Magurele

Ioan, M. R.; Bubueanu, G.; Tuta, C. S. (3 autori)

FUSION SCIENCE AND TECHNOLOGY, 2020, 76(3) 291-296,
10.1080/15361055.2020.1711850

4. Alanine pellets comparison using EPR dosimetry in the frame of quality assurance for a Gamma Knife system in Romania

Tuta, Catalin Stelian; Amiot, Marie Noelle; Sommer, Line; Ioan, Razvan Mihail (4 autori)

RADIATION PHYSICS AND CHEMISTRY, 2020, 170, 10865,
10.1016/j.radphyschem.2019.108653

5. Magnetization Lifetimes Prediction and Measurements Using Long-Lived Spin States in Endogenous Molecules

F. Teleanu, C. Tuta, A. Cucoanes, S. Vasilca, P.R. Vasos (5 autori)

Molecules, 2020, 25 (23), 5495, <https://www.mdpi.com/1420-3049/25/23/5495#>

6. Validation of in-house procedure for monitoring rare earth elements and lead elemental impurities in uranium materials

Serban, A.; Albota, F.; Virgolici, M.; Ionuz, E.; Tuta, C.S.; Stanciu, I.; Fugaru, V.; Sima, O. (8 autori)

Journal of Radioanalytical and Nuclear Chemistry, 2021, 330, 91-101,
<https://doi.org/10.1007/s10967-021-07926-2>

7. Recent Progress in Radon Metrology at IFIN-HH, Romania

Luca, A; Radulescu, I; Ioan, MR; Fugaru, V; Teodorescu, C; Barna, C; Tuta, CS; Tugulan, CL; Antohe, A; Lalau, I; Cîmpeanu, C; Postolache, C (12 autori)

Atmosphere, 2022, 13(3),363, 10.3390/atmos13030363

8. New tritium polymeric surface radioactive sources for beta radiation detection

C.S. Tuță, C. Postolache, C. Teodorescu, C. Barna, G. Bubueanu, M. Bacalum, M.R. Ioan (7 autori)

Romanian Journal of Physics, 2023, 301

9. Multiple Stroboscopic Detection of Long-Lived Nuclear Magnetization for Glutathione Oxidation Kinetics

Teleanu, F., Hanganu, A., Tuta, C., Saudet, A., Voda, M.A., Vasos, P.R. (6 autori)

Journal of Physical Chemistry Letters, 2023, 14(18), 4247-4251, 10.1021/acs.jpcllett.2c03924

Roxana Popescu

În prezent ocup funcția de bază de Șef de Lucrări în cadrul Departamentului de Bioinginerie și Biotehnologie, Facultatea de Inginerie Medicală, Universitatea Națională de Știință și Tehnologie Politehnica din București (UNSTPB), poziție ocupată prin concurs public, fiind titular al disciplinelor de specialitate „Testarea in vitro și in vivo a implantelor”, “Interacțiunea nanoparticulelor cu țesuturile vii” și respectiv “Biocompatibilitate și efecte adverse. Creșterea biocompatibilității”. Activitatea de cercetare o desfășor part-time în cadrul Institutului Național de Cercetare-Dezvoltare pentru Fizică și Inginerie Nucleară- Horia Hulubei IFIN-HH, Departamentul de Fizica Vieții și Mediului DFVM, unde ocup poziția de Cercetător Științific grad III, poziție ocupată prin concurs public.

În prezent sunt director de proiect al unui grant național GNAC ARUT nr 75/11.10.2023- “Soluții pentru tratament intracelular țintit cu nanoparticule- TINa”, acordat de Alianța Română a Universităților Tehnice, perioada octombrie 2023- decembrie 2024.

Activitatea mea de cercetare din ultimii 5 ani se desfășoară cu precădere în domeniul nanobiomedicinii, al testării și îmbunătățirii biocompatibilității materialelor și dispozitivelor medicale, al radiobiologiei și radiosensibilizării, activitate concretizată prin publicarea a 29 de lucrări științifice în calitate de autor principal și co-autor, în jurnale clasificate Q1 și Q2 din punct de vedere AIS și IF, în total AIS = 2.917 normat la numărul total de autori.

Cea mai importantă realizare științifică vine din recunoașterea internațională a activității personale, cercetările însumând un număr de 865 citări (din 2019), conform platformei Google Scholar, cu o creștere exponențială și un indice Hirsch total de 18. (<https://scholar.google.com/citations?user=ksVmmzMAAAAJ&hl=en>) . Indicele Hirsch conform platformei Web of Science este 15, având 58 de publicații indexate, ce însumează peste 650 de citări (ResearcherID: AAE-4523-2019).

Anamaria Hanganu

I received my PhD degree in Chemistry from University POLITEHNICA of Bucharest in 2011. I am a researcher with a strong experience in NMR characterization of a large diversity of organic compounds, polymers, natural compounds, complexes with applications in chemistry, biochemistry, biology and medicine; she is currently senior researcher III at “C. D. Nenitzescu” Institute of Organic and Supramolecular Chemistry of the Romanian Academy, Bucharest, Romania. Her scientific results were published in over 90 articles (670 citations, Hirsch index 16).

Research activities (last 5 years)

New spectroscopic time-scales were rendered accessible by our team's research in long-lived nuclear spin order – long lived states (LLS) and long lived coherences (LLC's), which extend the observation timescale of various chemical and biological processes. LLS were recently adapted to study in real-time biochemical transformations of key metabolites such as glutathione, the main antioxidant responding to radiation-related stress in cells. The research contributions developing the spectroscopic method all the way to in-cell work were published in *J.Phys.Chem.Lett.* 2023 (Teleanu, Hanganu, al., and Vasos).

NMR technique has numerous applications in the field of Food Chemistry. It can be used to detect fraud, to determine the chemical composition or in authentication studies of several types of fats (vegetal or animal). The research contributions developing the spectroscopic method coupled with chemometric methods were published in *Food* 2022 (Ivanova, Hanganu, al., and Chira) and in *J. Dairy Sci.* 2021 (Hanganu, Chira).

She contributed in development of: i) new materials starting from graphene oxide with fluorescent benzofurazan derivatives. Newly synthesized materials have specific biological relevance with potential for further development and use in biomedical applications - *Mater. Sci. Eng. C.* 2021; ii) homo- and heterometallic complexes of {Zn(II)}, {Zn(II)Ag(I)}, and {Zn(II)Au(I)}. Those complexes were evaluated for their potential antitumor activity in cell cultures established from two of the most frequent and highly aggressive female malignancies: breast cancer (luminal type A and triple negative breast cancer) and cervical cancer. Tested complexes exhibit activity against cells obtained from triple negative breast cancer, the treatment of which continues to be a serious challenge in clinical oncology - *Dalton Trans.* 2023; iii) 4-aminodiphenylamino derivatives. The biological evaluation showed that synthesized compounds have antimicrobial and antibiofilm activity – *Antioxidants* 2023; iv) new hydrazone-based fluorescent compound that is able to selectively label the endoplasmic reticulum (ER) in yeast and mammalian living cells - *Bioorg. Chem.* 2019; v) DNA-based sensing platforms - *Surf. Interfaces* 2024.

Ioana Fidel

I am a physicist, I completed my bachelor studies at the Faculty of Physics of the University of Bucharest, specializing in Medical Physics, 2019. The bachelor's thesis focused on the "*Spectroscopic study of the interaction of model lipid membranes with the flavonoid genistein*", the experimental part being carried out in the Department of Environmental and Life Physics, Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering (IFIN-HH).

In 2019 I started my master's studies, specializing in Medical Physics, also at the Faculty of Physics of the University of Bucharest. I had the opportunity to do an internship in the Department of Applied Nuclear Physics, IFIN-HH, immediately after starting my master's degree. In 2020 I joined the Biophysics and Biomedical Applications group within ELI-NP where I also completed my dissertation on the topic "*Magnetic methods in the study of the effects of ionizing radiation on biological systems*". The subject addressed for the master's thesis was the beginning of the research I was going to carry out, since I chose to continue in the same direction for the doctoral thesis. On October 1, 2021, I became a Phd student at the Interdisciplinary School of Doctoral Studies of the University of Bucharest, under the coordination of Professor Paul Vasos (he was one of the two coordinators I had for the dissertation thesis) with the subject of study: "*Methods of magnetic resonance for the study of radiation biomarkers by dose-rate variations*".

Between 2020 and 2023, I was part of the project team as a physicist on ELI-RO „*Advanced biological methods for investigating stress responses of normal and pre-leukemic cells under irradiation at ELI-NP – application for astrobiology and FLASH radiotherapy (CELLI)*”, coordinated by dr. Gina Manda from the Victor Babeş Institute from Bucharest. Since September 2023 I am part of the project team of „*Magnetic resonance methods to assess cellular metabolism and the formation of reactive oxygen species in the context of therapeutic approaches*” as a Research assistant in physics, project conducted by dr. Arnaud Comment.

The scientific results obtained in the last five years were presented at various events. Annually the Faculty of Physics organizes a Scientific Session, context in which I participated with a presentation for the bachelor's thesis (2019) and the dissertation thesis (2021).

I was a co-author on posters at the Flash Radiotherapy & Particle Therapy: one in 2022 („*Spectroscopic exploration of radiation dose-rate dependent free radical production in water*” - C. Zagrean-Tuza, I. Fidel, S. Vasilca, A. Cucoaneş, P.R. Vasos. The abstract was published in *Physica Medica: European Journal of Medical Physics* 94, S78, 2022) and in two different posters in 2023 („*Magnetic resonance biomarkers for timely detection of high dose-rate radiation effects in cells*” - P. R. Vasos, D. Serafin, C. Zagrean-Tuza, I. Fidel, S. Vasilca, D.

Neguț, M. Suditu, R. Popescu, M. Bacalum, G. Giubega, L. Neagu, P.G. Bleotu, M. Roșu, E. Hermann, M. Mirea, L. Nita, M. Iovea, O. Teșileanu, A. Hanganu, M. A. Voda, A. Sadet, I.C. Chiricuță) (*„Amino acids as liquid chromatography biomarkers for assessing the effect of high dose rate laser driven radiation”* - S. Vasilca, R. Popescu, D. Serafin, C. Zagrean-Tuza, M. Voda, I. Fidel, D. Neguț, A. Babeș, M. Mirea, L. Niță, M. Iovea, O. Teșileanu, P. Vasos)

At the The 19th European Magnetic Resonance Congress, 9-13 July 2023 I presented a poster with the title *„Magnetic resonance biomarkers of radiation dose-rate in glioblastoma cells”* - I. Fidel, C. Zagrean-Tuza, M. Suditu, I.C. Chiricuta, R. Popescu, M. Bacalum, D. Negut, S. Vasilca, A. Hanganu, D. Serafin, A. Sadet, M.A. Voda, P.R. Vasos, Euromar 2023 <https://euromar2023.org/wp-content/uploads/2023/07/PA-Book-v3.pdf> (pag 345)

I participated with a virtual poster *„Setup and protocol for high dose-rate irradiation of glioblastoma cells using secondary radiation from a high-power laser- poster”* - I.I. Fidel, G. Giubega, L. Neagu, P.G. Bleotu, M. Iovea, E. Hermann, M. Mirea, M. Neagu, L. Nita, A.M. Voda, D. Serafin, R. Popescu, M. Roșu, O. Teșileanu, P.R. Vasos, at the Eleventh International Conference on Radiation, Natural Sciences, Medicine, Engineering, Technology and Ecology 2023, Montenegro. I attended at the International Pathology Conference of the „Victor Babeș” Institute in november 2023 with an invited talk - *„From high field to Earthfield. Nuclear Magnetic Resonance spectroscopy methods to study the microglia and glioblastoma cells”* – Fidel I., Teșileanu O., Iovea M., Chiricuță I., Vasos P.

Due to the fact that I am using Nuclear Magnetic Resonance Spectroscopy in my studies, in March 2023 I had the opportunity to attend at the *ICBEB Courses “NMR for combatting diseases: from cancer to SARS-CoV-2”* in Sesto Fiorentino, Italy where I had a poster and presentation on the *„Study of biomarkers of radiation using magnetic resonance methods and Glioblastoma cells”* - I.I. Fidel, C. Zagrean-Tuza, M. Suditu, I.C. Chiricuță, R. Popescu, M. Bacalum, D. Neguț, S. Vasilca, A. Hanganu, D. Serafin, A. Sadet, M.A. Vodă, P.R. Vasos. Being interested in the effects of irradiation with secondary radiation generated by the interaction of High Power Lasers with a gas / solid target, I attended at the *„IMPULSE workshop: standardization of metrology procedures for lasers and secondary sources”* in March 2023. In order to complete my knowledges I was at the *ELI-NP Autumn School* in 2020 and 2023 (in 2020 I was also part of the organizing team). In 2020 I coordinated a high school students team at the competition organised during the *Entreprise Challenge Summer School* because the organizers invited me to attend due to my entrepreneurship skills. My team`s business idea was to give an opportunity to learn to poor children. In that year I enrolled in the competition *„Company of the Year 2020”* – my team project was *„Food 4 Science”*. We wanted to do a

canteen on the National Platform of Măgurele to give an opportunity to the students, professors, researchers and high school students to get together at breakfast, lunch and dinner in order to stimulate science communication and development of collaborations.

In the *UB Talks* competition (2023) I won second place with the presentation "*Radiation - friend or foe?*". Within the internal competition of ELI-NP, *Young Researchers & Young Engineers Days*, we supported in 2021 the work "*Magnetic resonance methods for the study of radiation biomarkers*", and in 2024 "*Towards radiobiological experiments at ELI-NP facility: the first trials at 100 TW and 1 PW*" (I obtained the fourth place).

Currently I am member in the *Council of Interdisciplinary School for Doctoral Studies* starting from 2021. Until then I was member in *University of Bucharest Senate*, member in „*Comisia de Monitorizare și Analiză a Utilizării Resurselor*”, member in „*Comisia de Evaluare și Asigurare a Calității*” (CEAC), member in the *Physics Students Association of Faculty of Physics UB*, member in „*Consiliul cu Probleme Studentești*”. From July 2023 I am member in the *Ampere Society*. From January 1, 2024 I am member in the *International Society for Magnetic Resonance in Medicine*.

In 2021 I published an article in the Annual Report 2020-2021 of Extreme Light Infrastructure - Nuclear Physics (ELI-NP), „*Towards FLASH water radiolysis followed by EPR and NMR spectroscopy*” - Fidel I., Zagrean C., Popescu R., Tuță C., Vasilca S., Neguț C., Chiricuță C., Cucoaneș A., Vodă A., Vasos P.

I am a person that likes to involve in outreach activities because I like to promote and communicate science. That's way I implemented in the Faculty of Physics different scientific event for attracting students and to show to the high school students that science is amazing. I also tried to bring the research institute closer to the students. My projects were „*Faculty of Physics from A to Z*” and „*Cu mic, cu mare... Prin Univers*” (in 2019 this event had more than 625 high school students as participants). In 2020 I was volunteer at the „*Școala de vacanță a Academiei Române*”, Extreme Light Infrastructure - Nuclear Physics. From 2019 until now I am part in the organizing team in the project "*Summer School of Science and Technology from Măgurele*". In 2019 -2020 I was coordinator at the faculty for the participants at the *UB Summer University*. In 2023 I organised *Școala Altfel ReCoNnect* - VII edition and I had a presentation - „*Radiation & cancer. A fight at the molecular level*”. I got involved in fundraising activities for the Măgurele Summer School of Science and Technology project in 2021 - I was the leader of the Alumni team, and in 2023 the leader of the Supporters team.

For my involvement in the organization of the Summer School of Science and Technology from Măgurele, me and the colleagues from the organizing team received the „*University of*

*Bucharest Senate Award for Author / Project / Research Team with the largest scientific contribution with impact on society in the field of Social Sciences for the project "Măgurele Summer School of Science and Technology". In the same day we received „The Grand Prize of the Senate of the University of Bucharest for the research project of the year for the project "Summer School of Science and Technology from Măgurele" – University of Bucharest". Due to my implication in the - European Project Horizon 2020-Saves2 – University of Bucharest I received the *Gold Award* for my activity as an ambassador. For my entire activity as a representative student and Senate member I received in 2021 the „*Diploma of excellence from the Senate of the University of Bucharest*”*

Now I am a Doctoral research assistant at ELI-NP in the Laser Gamma System Department, Biophysics and Biomedical Application Team. Until then I worked as a Physicist in this team. In 2020 I was the President of the Physics Student Association from University of Bucharest. In 2019 I was vicepresident of this Student Association. During this years 2018 – 2021 I was representative student in the Faculty of Physics Council and in the University of Bucharest Senate.

I have good communication skills acquired as a result of the activities I carried out in the last years, due to the entrepreneurship competitions I participated in as well as the presentations I hold (last year I started to represent ELI-NP at different scientific events and take tour visits in the ELI-NP facility). I have good leadership and management skills that are evidenced by all the teams that I have coordinated and competition were I have attended.

Silvana Vasilca

Silvana Vasilca is a chemist in the Biophysics and Biomedical Applications Group from ELI-NP and a PhD student at the University of Bucharest, Faculty of Chemistry. Passionate and dedicated research chemist with a strong background in chromatography and a keen interest in developing new strategies in separation sciences and the evaluation of ionizing radiation's impact on complex biological matrices.

Education

- M. Sc. in Chemistry, University of Bucharest, Faculty of Chemistry, Romania, 2016
- B. Sc. in Chemistry, University Of Bucharest, Faculty of Chemistry, Romania, 2014
- High school - Computer programming and mathematics, "David Prodan" National College, Cugir, Romania, 2011

Research experience

- Chemist, Extreme Light Infrastructure (ELI-NP), 2020-present
- Chemist, National Institute for R&D In Physics and Nuclear Engineering (IFIN-HH), 2015-present
- Mobility project, Center for Nuclear Studies and Technologies, Bobadela-Lisbon, Portugal, 2018
- Internship, Atomic Energy and Alternative Energies Commission (CEA), Grenoble, France, 2015

Selected publications

C. Zagrean-Tuza, M. Suditu, R. C. Popescu, M. Bacalum, D. Negut, **S. Vasilca**, A. Hanganu, I. Fidel, D. Serafin, O. Tesileanu, I. C. Chiricuta, A. Sadet, M. A. Voda, P. Vasos, Magnetic resonance biomarkers for timely diagnostic of radiation dose-rate effects (under review);
S. Vasilca, I. Petroviciu, D. Negut, M. Virgolici, F. Albu, A. Medvedovici, Supramolecular solvent based method for natural dyes extraction from fibers and holistic chemometric approaches used for assessing induced gamma irradiation's effects: A comprehensive study by LC-DAD-MS analysis, *Microchemical Journal*, 189 (2023);

I. Petroviciu, I. Teodorescu, **S. Vasilca**, F. Albu, A. Medvedovici, Liquid chromatography as analytical tool for the study of natural and early synthetic dyes in traditional Saxon textiles, *Heritage Science*, 11, 164 (2023);

A. Mateescu, N. Mincu, **S. Vasilca**, R. Apetrei, D. Stan, B. Zorila, D. Stan, The influence of sugar–protein complexes on the thermostability of C-reactive protein (CRP), *Scientific Reports*, 11, 13017 (2021);

F. Teleanu, C. Tuta, A. Cucoanes, **S. Vasilca**, P. R. Vasos, Magnetization Lifetimes Prediction and Measurements Using Long-Lived Spin States in Endogenous Molecules, *Molecules*, 25 (23), 5495 (2020);

V. Moise, **S. Vasilca**, A. Baltac, C. Pintilie, M. Virgolici, M. Cutrubinis, C. Kamerzan, D. Dragan, M. Ene, F. Albota, S. Maier, Physicochemical study for characterization of lyophilized collagens irradiated with gamma radiation and for optimization of medical device manufacturing process, *Radiation Physics and Chemistry*, 170, 108658 (2020);

S. Vasilca, M. Virgolici, M. Cutrubinis, V. Moise, I. Stanculescu, Q. K. Tran, A. Medvedovici, TD-GC-FID based approach for monitoring indoor borne styrene and optimization of irradiation conditions for radiopolymerization in consolidated artifacts, *Journal of Liquid Chromatography & Related Technologies*, 42, 217-224 (2019).

Alexandru Topor

Starting in 2019, I was offered the opportunity to study within the Doctoral School of Chemistry at the University of Bucharest, where I began my thesis on homo- and heteropolymetallic complexes under the supervision of Acad. Prof. Marius Andruh. Here, within research projects in theoretical and applied inorganic chemistry, I explored the magnetic and luminescent properties of compounds synthesized by myself and disseminated the results through two notable publications (A. Topor, M. Andruh et al, *Journ. Mater. Chem. C.*, 2021; *Dalton Trans.*, 2021) with a notable achievement being the synthesis of a molecular thermometer based on lanthanide luminescence.

My professional journey has been complemented by experience at the Horia Hulubei National Institute for Research and Development in Physics and Nuclear Engineering, where I am involved in the Extreme Light Infrastructure – Nuclear Physics project under the guidance of Prof. Paul R. Vasos within the biophysics group. Here, I continue to have the opportunity to explore the fascinating field of nuclear magnetic resonance, with two notable publications (A. Topor, P. R. Vasos et al, *Symmetry*, 2021; *Chem. Comm.*, 2023) and an accepted patent where I developed a method for determining paramagnetic compounds from aqueous samples using NMR in terrestrial field.

Throughout this period, I have also participated in and received several notable awards at national and international conferences, notably the recognition from the Romanian Chemical Society at the International Conference "Students for Students" XVI, Babeş-Bolyai University, Cluj-Napoca, 2019, and the First Prize in the Doctoral section at the Session of Students' Communications XVI, University of Bucharest, 2021.

Octavian Ianc

I graduated from the “Gheorghe Lazăr” National College in Sibiu in 2021, with a focus on Mathematics and Computer science. My high-school years have been characterized by a genuine interest in the field of STEM, culminating in multiple participations in Olympiads and similar competitions. It was natural for me to pursue a degree in this direction, which I chose in the form of the Faculty of Physics from the University of Bucharest, where I now am a student in my third and final year. Over the course of my degree, I also had the chance to study for an year as an exchange student in Germany, where I greatly improved my knowledge and teamwork abilities.

My first contact with the Biophysics and Biomedical Applications Group from ELI-NP was in the summer of 2021 when, as part of a summer school I was participating in, I visited them as an intern for a few days. I quickly became interested in this field of study, which gracefully merges theoretical simulations with in-vivo or in-vitro laboratory work, and I continued as an intern in the group. In May 2022 I started officially working there as a technician, a position that I've been working on ever since. My activity mainly consists of performing spin dynamics simulations and data analysis. I participated in multiple projects and activities, improving both my knowledge and my general research abilities and work ethic. I am also working on writing my Bachelor's thesis under the supervision of Prof. Vasos and based on the activity that I have been doing as a member of the research group.

To conclude, my membership in the Biophysics and Biomedical Applications Group has strongly shaped my educational and my upcoming scientific paths and will continue to do so for the foreseeable future.

Diana Serafin

Five years ago, in 2019, I was a high-school student who just started learning and exploring the wonders of physics. I graduated high-school in 2020, from the College „National Gas School” , located in Mediaş, Sibiu county, specializing in mathematics and computer science. During the same year, I embarked on my academic journey at the Faculty of Physics, University of Bucharest, focusing on the field of medical physics. Situated in Măgurele, Ilfov, this institution not only equipped me with a comprehensive understanding of my chosen discipline but also facilitated access to prominent research establishments in the region, including Horia Hulubei Institute for R&D in Physics and Nuclear Engineering (IFIN-HH).

The first year of my bachelor studies marked the beginning of my research career, as I commenced an internship at IFIN-HH within the esteemed Extreme Light Infrastructure-Nuclear Physics (ELI-NP) project. Here, I had the privilege to work under the guidance of Prof. Paul R. Vasos, leading the dynamic Biophysics and Biomedical Applications group. As a dedicated student, I eagerly immersed myself in the fascinating field of nuclear magnetic resonance spectroscopy (NMR) and in 2021 I contributed to the publication of “Rotating-Frame Overhauser Transfer via Long-Lived Coherences”(Symmetry 2021), which showcased enhancements in magnetization transfer, that has the potential to improve the study of large proteins’ structure, by utilizing long-lived coherences (LLCs), serving as source of magnetization. So, in my first year at ELI-NP as an intern, I obtained knowledge of data analysis tools for research in molecular and nuclear physics, as well as tools for NMR spectroscopy analysis.

In 2022, I was employed as a Junior Technician in the Biophysics Lab of ELI-NP, stepping into the intricacies of scientific experimentation, as I derived into the world of laboratory procedures and methodologies, for the investigation of magnetic resonance biomarkers in metabolic profiling studies on irradiated cells. This was also the study that my bachelor’s thesis was based on and it was titled “Investigation of Magnetic Resonance Biomarkers in Metabolic Profiling Studies for U-251 MG Glioblastoma Cells”, which included the discovery of radiation effects on cells as a function of dose and dose rate by observing metabolic changes in cancer cells, with the use of NMR spectroscopy.

In the summer of 2023, I graduated from the Faculty of Physics, with a Bachelor’s degree in Medical Physics, and in autumn of 2023 I started my Master’s studies at the Faculty of Medicine,

University of Medicine and Pharmacy “Carol Davila”, specializing in Medical Biophysics and Cellular Biotechnology.

Over the years, I actively engaged in various volunteering initiatives, aiming to develop myself as an individual and to foster effective teamwork skills. During high-school, I contributed to the 2ForKids volunteer team, while in college I joined the Association of Physics Students. Through the ASF-UB affiliation I participated in multiple events such as European Researchers' Night (2021-2023), Măgurele Summer School of Science and Technology (MsciTech) and numerous other impactful projects within the university community.