

PERSONAL INFORMATION

Katalin Kovács



📍 National Institute for Research and Development of Isotopic and Molecular Technologies (INCDTIM) Cluj-Napoca

☎ +40 264 584037 ext. 194 📠 +40 745 653459

✉ Kkovacs@itim-cj.ro

🌐 <http://ro.itim-cj.ro/portfolio/dr-kovacs-katalin/>

Sex Female | Date of birth 08/04/1980 | Nationality Romanian

POSITION **Senior researcher (R4) CS1**

WORK EXPERIENCE

Dec. 2007 – Oct. 2009

Research assistant, Scientific researcher

National Institute of R&D Isotopic and Molecular Technologies, Cluj-Napoca, Romania

- Modelling the interaction of strong ultrashort laser pulses with atomic and molecular gases;
- High-order harmonic generation (HHG), attosecond pulse formation: modeling and correlation with experiments, with special focus on the HHG with two fundamental laser pulses from the same or different spectral region;
- Calculating electron trajectories in strong electromagnetic fields of arbitrary temporal or spectral profile;
- Modelling migration of chemical impurities into foodstuff;

Business or sector Scientific research

Nov. 2009 – Jul. 2021

Senior researcher SR III, SR II

National Institute of R&D Isotopic and Molecular Technologies, Cluj-Napoca, Romania

- Modeling the propagation of strong femtosecond laser pulses in ionizing gas medium;
- Modeling the highly nonlinear interaction of strong ultrashort laser pulses with noble gas atoms in the framework of the strong-field approximation;
- High-order harmonic generation (HHG), attosecond pulse formation: numerical modeling and correlation with experiments by including the macroscopic effects in the modeling which induce pulse reshaping during propagation;
- Calculating electron trajectories in strong electromagnetic fields of arbitrary temporal or spectral profile;

Business or sector Scientific research

Aug. 2021 – present

Senior researcher SR I

**National Institute of R&D Isotopic and Molecular Technologies,
Cluj-Napoca, Romania**

- Exploring feasible methods for the generation of single attosecond pulses: HHG with two fundamental laser pulses from the same or different spectral regions; gating techniques to select one single attosecond emission; quasi-phase matching methods;
- Optimization of the attosecond pulse train emission in order to increase high-harmonic flux and maximum obtainable photon energy;
- Exploring the positive consequences of laser pulse reshaping on the selection of SAPs and on the overall efficiency of the HHG process;
- Modeling spatial-temporal coupling in the process of HHG: attosecond lighthouse and spectral selection of successive attosecond emissions;
- Study laser pulse filamentation in atmospheric conditions
- Reconstruction of laser pulse shapes – amplitude and phase – using convolutional neural networks

Jan. 2011 – Oct. 2011
[Business or sector](#) Scientific research
Research fellow

**University of Szeged, Dept. Of Optics and Quantum Electronics,
Szeged, Hungary**

- Modelling high-harmonic generation and attosecond pulse formation in the presence of multiple combined electromagnetic pulses
- Development of quasi-phase-matching techniques
- Modelling THz-assisted HHG

[Business or sector](#) Scientific research

**EDUCATION
AND TRAINING**

- Oct. 2003 – Nov. 2007. **PhD**
Babes-Bolyai University, Cluj-Napoca, Romania
Modelling magnetization phenomena using Monte Carlo methods
Study of non-thermal phase transitions
- Oct. 2002 – Jun. 2003. **Msc**
Babes-Bolyai University, Cluj-Napoca, Romania
Computational Physics, Statistical Physics, Stochastic processes
Building simple models to reproduce main features of complex phenomena
- Oct. 1998 – Jun. 2002. **Bsc**
Babes-Bolyai University, Cluj-Napoca, Romania

Physics: Classical Mechanics, Electricity and Magnetism, Optics, Atomic, Molecular and Nuclear Physics, Quantum Mechanics, Statistical Physics, Solid State Physics
 Mathematics, Computer science

PERSONAL SKILLS

Mother tongue(s) Hungarian

Other language(s)	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
Romanian	C2	C2	C2	C2	C2
Bachelor degree 1998					
English	C1	C1	C1	C1	C1
Certificate Alpha					

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

Communication skills Good communication skills gained through participating as team member in several research projects.
 Thanks to the intense involvement in the organization of two international conferences, I improved my skills of debate, solving unexpected problems, communicating in tense situations.

Organisational / managerial skills Project leader of 2 national scientific projects (post-doc type project 2011-2014, young research team 2015-2017)
 Project member in 2 international FP7 projects (closed) and 12 national projects (5 with UBB affiliation, 7 INCDTIM affiliation)
 Organizer of 1 International Workshop, secretary of 1 international conference

Job-related skills Building physical models for critical phenomena and laser-atom interaction
 Developing computer codes for the implementation of the physical models

Digital competence	SELF-ASSESSMENT				
	Information processing	Communication	Content creation	Safety	Problem solving
	Proficient user	Proficient user	Proficient user	Proficient user	Proficient user

Levels: Basic user - Independent user - Proficient user
[Digital competences - Self-assessment grid](#)

Operating systems Windows and Linux;
programs: Origin, Microsoft Office;
programming languages: Fortran, C, LaTeX

Other skills Teaching experience at Babes-Bolyai University 2003-2007:
problem solving and laboratory practice in classical mechanics,
thermal physics, quantum mechanics, physics and science
development

Driving licence B

ADDITIONAL INFORMATION

Publications Author and co-author of **48 ISI papers** in the domain of statistical
Presentations physics, mathematical and applied physics, nonlinear and ultrafast
Projects optics, attosecond physics;
Conferences H-index: 13
Seminars Independent citations: 550 (Web of Science)
Honours and awards Researcher ID: <http://www.researcherid.com/rid/B-5629-2011>
Memberships Personal page: <http://www.itim-cj.ro/~kkovacs/>
References
Citations
Courses
Certifications

ANNEXES

Replace with list of documents annexed to your CV. Examples:

- copies of degrees and qualifications;
- testimonial of employment or work placement;
- publications or research.