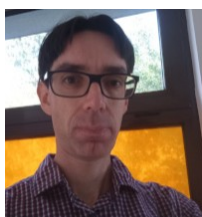


## PERSONAL INFORMATION

## George Alexandru Nemnes



University of Bucharest, Faculty of Physics, Atomistilor 405, Magurele, Ilfov, ROMANIA (077125)

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Gender Male | Nationality Romanian

ORCID: 0000-0002-8500-4953

ResearcherID: <http://www.researcherid.com/rid/B-7091-2011>

## WORK EXPERIENCE

2023 - present

**Professor**

University of Bucharest, Faculty of Physics, "Materials and Devices for Electronics and Optoelectronics Research Center", 077125 Magurele-Ilfov, Romania (until 2020) and The Research Institute of the University of Bucharest – I.C.U.B. (starting 2020)

- Teaching activities: Solid State Physics, Magnetism – Spintronics, Computational methods for electronic structure, Computing systems.
- Research activities: physics of semiconductors; transport in nanostructures; molecular electronics; density functional theory (DFT) calculations, many-body systems, machine learning techniques.

2021 - present

**Scientific Researcher I**

Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering (IFIN-HH), Department of Computational Physics and Information Technologies (DFCTI), 077125 Magure-Ilfov, Romania

- Research activities: Computational physics, in particular materials and electronic devices, such as applications for quantum computing, biosensing devices for respiratory diseases; Machine learning techniques for the design of new materials and many-body quantum systems; Modeling perovskite solar cells; Density functional theory (DFT) for electronic structure calculations.

2017 - 2021

**Scientific Researcher II**

Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering (IFIN-HH), Department of Computational Physics and Information Technologies (DFCTI), 077125 Magure-Ilfov, Romania

- Research activities: Computational physics of nanodevices; Machine learning techniques for the design of new materials; Modeling perovskite solar cells; Density functional theory (DFT) for electronic structure calculations.

2016 - 2023

**Assoc. Prof.**

University of Bucharest, Faculty of Physics, "Materials and Devices for Electronics and Optoelectronics Research Center", 077125 Magurele-Ilfov, Romania (until 2020) and The Research Institute of the University of Bucharest – I.C.U.B. (starting 2020)

- Teaching activities: Solid State Physics, Magnetism – Spintronics, Parallel Computing Architectures, Computing systems.
- Research activities: physics of semiconductors; transport in nanostructures; molecular electronics; density functional theory (DFT) calculations.

2016 - 2017

**Scientific Researcher III**

Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering (IFIN-HH), Department of Computational Physics and Information Technologies (DFCTI), 077125 Magure-Ilfov, Romania

- Research activities: Computational physics of nanodevices; molecular electronics and bio-applications; density functional theory (DFT) calculations.

2011 - 2015 **Research Assistant**  
Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering (IFIN-HH), Department of Theoretical Physics, 077125 Magure-Ifov, Romania

- Research activities: physics of nanodetectors; advanced statistical methods. Project: PN-II-ID-PCE-2011-3-0960

2009 - 2015 **Lecturer / Scientific Researcher III**  
University of Bucharest, Faculty of Physics, "Materials and Devices for Electronics and Optoelectronics Research Center", 077125 Magurele-Ifov, Romania

- Teaching activities: Solid State Physics, Magnetism – Spintronics, Parallel Computing Architectures, Computing systems.
- Research activities: physics of semiconductors; transport in nanostructures; molecular electronics; density functional theory (DFT) calculations.

2004 - 2008 **PhD student, Researcher**  
Technical University Chemnitz, D-09107 Chemnitz, Germany

- Research activities: PhD thesis "Sampling procedures for low temperature dynamics on complex energy landscapes".

[Business or sector Research](#)

## EDUCATION AND TRAINING

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2020 **Habilitation in Physics**  
**Affiliation to the Doctoral School of Physics, University of Bucharest**  
Defence Habilitation thesis in 2019: "*Computational studies on advanced materials with applications to nanoelectronic and optoelectronic devices*"

2004 - 2008 **PhD degree**  
Technical University Chemnitz, D-09107 Chemnitz, Germany (*magna cum laude*)

- Dynamics of complex systems; spin glasses; parallel computing; computational physics.

1998 - 2003 **Diplomate Engineer**  
University of Bucharest, Faculty of Physics, Romania (during 2001-2003 student at Brandenburg Technical University)

- Solid State Physics.

2001 - 2003 **Physicist**  
Brandenburg Technical University, Germany

- Theoretical physics; semiconductor physics; semiconductor devices; transport properties of nanotransistors.

**Awards**

1997 – First prize - National Physics Olympics  
1998 – First prize - National Physics Olympics

2017 -- Prize of University of Bucharest Senate - *Best research paper in Exact Sciences in 2017*

G. A. Nemnes, Cristina Besleaga, A. G. Tomulescu, Ioana Pintilie, L. Pintilie, K. Torfason, A. Manolescu, "Dynamic electrical behavior of halide perovskite based solar cells", *Sol. Energy Mater. Sol. Cells* 159, 197 (2017)

2023 -- Prize of University of Bucharest Senate - *Best MSc thesis in Exact Sciences in 2023*

MSc Student: Calin-Andrei Pantis-Simut

"Mapping confinement potentials and charge densities of many-body quantum systems using conditional generative adversarial networks", *Mach. Learn.: Sci. Technol.* 4 025023 (2023)

2023 -- Prize of University of Bucharest Senate - *Best research paper in Exact Sciences in 2023*

N. Filipoiu, A. T. Preda, D.-V. Anghel, R. Patru, R. E. Brophy, M. Kateb, C. Besleaga, A. G. Tomulescu, I. Pintilie, A. Manolescu, G.A. Nemnes, "Capacitive and Inductive Effects in Perovskite Solar Cells: The Different Roles of Ionic Current and Ionic Charge Accumulation", *Phys. Rev. Applied* 18, 064087 (2022)

PERSONAL SKILLS

Mother tongue(s) Romanian

Other language(s)

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

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

Communication skills

- Interaction with BSc, MSc, PhD students: good communication skills gained through my experience as Professor at the Faculty of Physics, Bsc-, MSc- and PhD-coordinator.
- Collaborations with scientists in different institutions (National institute for materials physics – INCDFM, National institute for lasers, plasma and radiation physics – INFLPR, Reykjavik University, Brandenburg Technical University) .

Organisational / managerial skills

**Project director** of PN-II-RU-RP1/September2008, PN-II-RU-PD-2011-3-0044, PN-III-P2-2.1-PED-2019-1567 and PN-III-P4-ID-PCE-2020-1142. **Project responsible** of SEE 36/2021. Member in other national and international projects.

2023-2024 „Design of novel nanomaterials for robust quantum transport (NanoMaQ)” – EEA mobility project 22-MOB-0048 – Academic Project Coordinator – ANPCDEFP / EEA

2021-2023 „Machine Learning Techniques for Solving Quantum Many-Body Problems (QuanticLearn)”, PN-III-P4-ID-PCE-2020-1142 – Project Coordinator – Uefiscdi – Budget: 246047 EUR <http://solid.fizica.unibuc.ro/~nemnes/QuanticLearn/index.html>

2021-2024 „Towards perovskite large area photovoltaics (PERLA-PV)”, SEE 36/2021 – Project Responsible (IFIN-HH) – Uefiscdi / EEA – Budget: 97000 EUR <http://perla-pv.ro/>

- 2021-2023 „Theoretical and experimental methods for perovskite photovoltaics (TEMPERO-PV)” – EEA mobility project 21-MOB-0014 – Academic Project Coordinator – ANPCDEFP / EEA
- 2020-2022 „Optimization of photoactive perovskite materials using machine learning techniques (OPTIM-PRV)”, PN-III-P2-2.1-PED-2019-1567 – Project Coordinator (IFIN-HH) – Uefiscdi – Budget: 123107 EUR <https://optim-prv.nipne.ro/>
- 2011-2013 “Advanced many-body spin transport and spin relaxation phenomena in nanowire systems”, PN-II-RU-PD-2011-3-0044 – Project Coordinator – CNCS – Budget: 69534 EUR <http://solid.fizica.unibuc.ro/~nemnes/PD/index.html>
- 2009-2011 „Cylindrical Nanowire Transistor in the Landauer-Büttiker Formalism”, CNCSIS RP-1, Septembrie 2008 – Project Coordinator – CNCSIS – Budget: 107419 EUR <http://solid.fizica.unibuc.ro/~nemnes/RP-1/index.html>

#### Job-related skills

I am currently supervising 4 PhD students employed in IFIN-HH / DFCTI : (Nicolae Filipoiu, Amanda Teodora Preda, Alaa Allosh, Calin-Andrei Pantis Simut), 1 PhD student employed in INFLPR (Ioan Ghitu) and I am collaborating with other PhD and MSc students (e.g. Iulia Zai at ELI-NP).

My research activity is focused on computational physics aspects in materials and electronic devices, such as electrical and thermal transport properties of nanodevices, biosensing elements, perovskite solar cells, applications of fractional exclusion statistics to interacting particle systems and DFT-based description of semiconductor and molecular systems. Many of the published papers concern computational studies in material science, defect/dopant engineering and modeling of electronic and optoelectronic devices. Recently, machine learning techniques were developed to predict electronic properties of materials and quantum many-body systems.

#### Computer skills

C/C++ programming (scientific applications); Tools for machine learning (TensorFlow, scikit-learn) Parallel programming (MPI); Computer cluster administration (FAI, SLURM); FPGA programming (using Verilog); Linux operating system.

#### Driving licence

Category B vehicles

#### ADDITIONAL INFORMATION

- Publications
- Projects
- Conferences
- Seminars
- Honours and awards
- Memberships
- References

- 84 ISI papers, 71% as principal author (first or corresponding author)
- Projects won in competition (as principal investigator): PN-II-RU-RP1/September2008 > 100000 EUR; PN-II-RU-PD-2011-3-0044 > 60 000 EUR; PN-III-P2-2.1-PED-2019-1567 > 120 000 EUR; PN-III-P4-ID-PCE-2020-1142 > 240 000 EUR
- Invited talks at Reykjavik University, TIM18 Physics conference, 4th Edition of IWMP 2019, most recent – Invited speaker at DEPERO 2023 conference: <https://www.nanoge.org/DEPERO/general-information>
- Prizes of the University of Bucharest Senate: *Best research paper in Exact Sciences in 2017 and 2023; Best MSc thesis in Exact Sciences in 2023.*
- Participation in COST action EuMINE, aiming at aims at promoting an international, interdisciplinary and intersectoral community focused on the application of materials informatics to the development and engineering of advanced materials, using machine learning and materials modelling.
- Vice-president of the “Computational and Mathematical Physics” section of the Romanian Society of Physics (SRF); former president at the CMP section of SRF.
- Habilitation in Physics – 2020;
- Citations in Nature Physics (IF>22), Nature Photonics (IF>38), Nature Communications (IF>13), Chemical Reviews (IF>54) etc.

#### ANNEXES

- List of publications.