

Amanda PREDA

Curriculum vitae

Magurele
077125
Romania

* 31.05.1996

+40 (740) 142 695

✉ amanda.preda96@gmail.com



Education

- 2011–2015 **Baccalaureate Diploma**, *C. N. Ienachita Vacarescu*, Targoviste, 9.93
- Certificate in Advanced English (CAE)
 - ECDL Certificate
 - National Olympiad of Physics (2013, 2014)
 - National Olympiad of Chemistry (2012)
 - Interdisciplinary Olympiad of Earth Sciences (2012, 2013)
- 2015–2019 **Bachelor's Degree**, *Faculty of Physics, University of Bucharest*, Magurele, 9.84
- Applied Engineering Sciences
- 2019–2021 **Master's Degree**, *Faculty of Physics, University of Bucharest*, Magurele, 10
- Theoretical and Computational Physics
- 2021–present **PhD**, *Faculty of Physics, University of Bucharest*, Magurele, 10
- Condensed Matter Physics

Bachelor thesis

Rashba spin-orbit interaction in quantum rings

Master thesis

Toroidal Moments and the Mathematical Properties of the Toroidal Dipole Operator

PhD thesis

Advanced Computational Methods for Quantum Information Processing

Experience

- 2018-2018 **Research Assistant**, *Microelectronica*, Bucuresti
Internship
- 2020–present **Research Assistant**, *Horia Hulubei National Institute for R&D in Physics and Nuclear Engineering*, Magurele
- Department of Theoretical Physics (2020-2021)
- Research in toroidal moments
- Department of Computational Physics and Information Technologies (2021-present)
- R-matrix formalism, Kwant, Tight Binding formalism, Exact diagonalization method
 - Machine Learning techniques applied to material and condensed matter physics
 - DFT calculations with SIESTA and TransSIESTA

Languages

English C2

CAE Certificate

Computer skills

Programming Languages Python, C/C++, Matlab

OS Linux

Writing environments Latex, Microsoft Office

Others autoCAD, Origin

Conferences

- 2016 Electronics for Beyond the Silicon Era: Organic Electronics, Sinaia, Romania
- 2018 International Conference on Spintronics, Warsaw, Poland
- 2021 International Conference on Mathematical Modeling in Physical Sciences
 - Quantized toroidal dipole eigenvalues in nano-systems - virtual presentation
- 2022 International Balkan Workshop on Applied Physics and Materials Science, Constanta, Romania
 - Machine Learning Techniques Applied To Many-Particle States In Quantum Dot Systems - oral presentation
- 2022 Northern Lights Conference, Reykjavik, Iceland
 - Tuning electronic band structure properties in Lieb-like lattices - poster
- 2023 DPG Spring Meeting - Condensed Matter Section, Dresden, Germany
 - Predicting charge density maps in 2D nanostructures with machine learning techniques - oral presentation
- 2023 BTU, Cottbus, Germany
 - Quantum Transport for Information Processing - invited talk
- 2023 International Balkan Workshop on Applied Physics and Materials Science, Constanta, Romania
 - The Design Of A Probabilistic Quantum Sorter In The R-Matrix Formalism - poster
- 2025 DPG Spring Meeting - Condensed Matter Section, Regensburg, Germany
 - Designing a quantum sorter based on two-dimensional topological insulators - oral presentation

Publications

- [1] D. V. Anghel and A. T. Preda. Quantized toroidal dipole eigenvalues in nano-systems. *Journal of Physics: Conference Series*, 2090(1):012151, nov 2021.
- [2] Dragoş-Victor Anghel and Amanda Teodora Preda. Methods of solving the system of equations for the energy gap in the revisited bcs theory of superconductivity. *MethodsX*, 8:101388, 2021.
- [3] Dragoş-Victor Anghel, Amanda Teodora Preda, and George Alexandru Nemnes. The r-matrix formalism for two-particle scattering problems. *Physics Letters A*, 425:127865, 2022.
- [4] Mihaela Cosinschi, Amanda T. Preda, C.-A. Pantis-Simut, N. Filipoiu, I. Ghitu, M. A. Dulea, L. Ion, A. Manolescu, and G. A. Nemnes. Collective dynamics of ca atoms encapsulated in c60 endohedral fullerenes. *Phys. Chem. Chem. Phys.*, 26:22090–22098, 2024.
- [5] Mircea Dolineanu, Amanda Teodora Preda, and Dragoş-Victor Anghel. The toroidal dipole operator in nanostructures. *Physica A: Statistical Mechanics and its Applications*, 598:127377, 2022.
- [6] Nicolae Filipoiu, Amanda Teodora Preda, Dragoş-Victor Anghel, Roxana Patru, Rachel Elizabeth Brophy, Movaffaq Kateb, Cristina Besleaga, Andrei Gabriel Tomulescu, Ioana Pintilie, Andrei Manolescu, and George Alexandru Nemnes. Capacitive and inductive effects in perovskite solar cells: The different roles of ionic current and ionic charge accumulation. *Phys. Rev. Appl.*, 18:064087, Dec 2022.
- [7] K. V. Kulikov, D. V. Anghel, A. T. Preda, M. Nashaat, M. Sameh, and Yu. M. Shukrinov. Kapitza pendulum effects in a josephson junction coupled to a nanomagnet under external periodic drive. *Phys. Rev. B*, 105:094421, Mar 2022.
- [8] G A Nemnes, T L Mitran, A T Preda, I Ghiu, M Marciu, and A Manolescu. Investigation of bi-particle states in gate-array-controlled quantum-dot systems aided by machine learning techniques. *Physica Scripta*, 97(5):055813, apr 2022.
- [9] Calin-Andrei Pantis-Simut, Amanda Teodora Preda, Nicolae Filipoiu, Alaa Allosh, and George Alexandru Nemnes. Electric-field control in phosphorene-based heterostructures. *Nanomaterials*, 12(20), 2022.
- [10] Calin-Andrei Pantis-Simut, Amanda Teodora Preda, Lucian Ion, Andrei Manolescu, and George Alexandru Nemnes. Mapping confinement potentials and charge densities of interacting quantum systems using conditional generative adversarial networks. *Machine Learning: Science and Technology*, 4(2):025023, may 2023.
- [11] Amanda Teodora Preda, Iulia Ghiu, Lucian Ion, Ulrich Wulf, Andrei Manolescu, and George Alexandru Nemnes. Implementation of a multi-terminal quantum sorter in solid state systems. *Scientific Reports*, 15(1):23738, 2025.
- [12] Amanda Teodora Preda, Calin-Andrei Pantis-Simut, Mihai Marciu, Dragoş-Victor Anghel, Alaa Allosh, Lucian Ion, Andrei Manolescu, and George Alexandru Nemnes. Design of nanoscale quantum interconnects aided by conditional generative adversarial networks. *Applied Sciences*, 14(3), 2024.

- [13] Ulrich Wulf, Amanda Teodora Preda, and George Alexandru Nemnes. Transport in a two-channel nanotransistor device with lateral resonant tunneling. *Micromachines*, 15(10), 2024.