

## PERSONAL INFORMATION

**Neculai Plugaru**

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**Gender** Male. | **Date of birth** November 11, 1954. | **Nationality** Romanian.

## WORK EXPERIENCE

February 2020 - present

**Senior Research Scientist, CS1**

National Institute for Research and Development in Microtechnologies (IMT-Bucuresti), 126A, Erou Iancu Nicolae Street, 077190, Bucharest, Romania.

October 2009 - February 2020

**Senior Research Scientist, CS1**

National Institute of Materials Physics, 405A Atomistilor Str, Magurele, Ilfov, 077125, Romania.

September 2004 – September 2009

**Professor**

Centro Politécnico Superior (CPS), Universidad de Zaragoza, 50018 Zaragoza, Spain.

Taught course: Electromagnetic fields and waves.(Undergraduate level)

September 2001 – September 2004

**Research Fellow**

Instituto de Ciencia de Materiales de Aragón (I.C.M.A), C.S.I.C., Zaragoza, Spain.

September 1999 – September 2001

**Post doctoral stage**

Instituto de Ciencia de Materiales de Aragón (I.C.M.A), C.S.I.C., Zaragoza, Spain.

Grant funded by Ministerio de Ciencia y Tecnología de España y Consejo Superior de Investigaciones Científicas (C.S.I.C), Spain.

November 1983 – September 1999

**Physicist ('83-'90), Research Scientist ('90-'94), Research Scientist CS3 ('94-'96), Senior Research Scientist CS2 ('96-'99), Senior Research Scientist CS1 since May 1999**

National Institute of Materials Physics, 405A Atomistilor Str., Magurele, Ilfov, 077125, Romania.

September 1980 – October 1983

**Physicist**

National Institute for Scientific and Technical Research (INCREST), Bucharest, Romania.

## RESEARCH ACTIVITY

2000 – present

**Current research interests**

Modeling materials and interfaces for advanced electronic devices within Density Functional Theory (DFT), DFPT and TD-DFT.

Atomistic design of multiferroic heterostructures integrated with the silicon nanotechnology.

High-Throughput Calculations and Machine Learning for Materials Design and Discovery.

1980 – early 2000s

**Previous research activity**

Using macroscopic characterization techniques, Fe-57 Mössbauer spectroscopy, neutron diffraction, as well as XMCD and XAS synchrotron techniques, NP brought contributions to the description of complex magnetic phenomena in 4f-3d electron systems, such as: i) Competing exchange mechanisms; ii) exchange and magnetocrystalline anisotropy effects on magnetic structures and magnetic phase diagrams; iii) Effects of chemical, substitutional and/or lattice disorder on the electronic charge and spin densities; iv) Local spin and orbital moments, effect of orbital hybridizations on exchange coupling.

#### User of Large Facilities

May 2005, Institut Laue-Langevin (ILL), Grenoble, D2B powder diffractometer.

October 2005, Berlin Neutron Scattering Center (BENS), Hahn-Meitner Institute, E9 powder diffractometer.

#### RESEARCH PROJECTS

##### 2020 – 2023 **IMT-Bucuresti, PN-III-P4-ID-PCE-2020-1985 - COMPFER**

Project title: **Computational design and engineering of functional ferroic interfaces.** Role in the Project: Director

##### 2018 – 2019 **NIMP, PCCF 16**

Project title: **Control of electronic properties in ferroelectric perovskite heterostructures: from theory to applications.** Role in the Project: Collaborator

##### 2013 – 2015 **IMT, ROSA – MATSPACE**

Project title: **Investigation of semiconductor oxide materials performance for space environment applications.** Role in the Project: Collaborator

##### 2012 – 2015 **NIMP, Young researchers teams PN-II-RU-TE-2012-3-0320**

Project title: **Metal-ferroelectric interfaces: From first principles to experimental optimization.** Role in the project: Experienced research scientist

##### 2009 – present **NIMP Core Programs**

##### 2014 **NIMP, EEA Grant: 8SEE/30.06.2014 PERPHECT**

Project title: **Perovskites for Photovoltaic Efficient Conversion Technology.** Role in the Project: Collaborator

##### 2002–2006 **ICMA, IMANA PGE/FEDER, MAT2002/166**

Project title: **Macroscopic and Nanometric Magnets.** Role in the Project: Collaborator

##### 2001–2002 **ICMA, SPring8 (Hyogo, Japan)**

Project title: **Giant 5d orbital magnetic moment of rare-earths.**

Project title: **High-Field XMCD study of induced magnetic compensation in  $\text{Nd}_2\text{Fe}_{14}\text{B}$**  Role in the Project: Collaborator

##### 2000 **ICMA, European Synchrotron Radiation Facility (ESRF), (Grenoble, France)**

Project title: **Determination of Eu electronic state in Eu-doped rare-earth intermetallics.**

Role in the Project: Collaborator

##### 1999–2002 **ICMA, MAT99/1142, Ministerio de Ciencia y Tecnologia de España**

Project title: **Nuevos Materiales Magnéticos (intermetálicos y moleculares) de interés técnico y básico.**

Role in the Project: Collaborator

**EDUCATION AND TRAINING**

- 1995 **PhD, Thesis Title: Magnetic Properties of Ternary Rare Earth - 3d Transition Metal Compounds**  
Babes-Bolyai University, Cluj, Romania.
- 1980 **M.Sc. in Electronic Processes in Condensed Matter Physics**  
Faculty of Physics, University of Bucharest, Romania
- 1979 **B.Sc. in Physics**  
1975 Faculty of Physics, University of Bucharest, Romania

**Participations in Hands-on Workshops**

- November 2017 "Spin-orbit effects in molecules and solids: Diversity of properties and computational precision" and the Tutorial "Hands-on FPLO" Dresden, Germany.
- February 2015 CECAM/Psi-k Research Conference: "Frontiers of first-principles simulations: materials design and discovery", Berlin, Germany.
- October 2009 "DFT meets Solid State Chemistry", MPI-CPFS Dresden, Germany.
- August 2008 "DFT meets Experiment and the 7-th Tutorial Hands-on FPLO", Dresden, Germany.
- July 2002 "Electronic Structure of Solids", IFW-Dresden, Germany.
- March 2002 "Hands-on FPLO", IFW-Dresden, Germany.

**Short-term research stages**

- November 2016 School of Science and Engineering, Reykjavik University, Reykjavik, Iceland.
- October 2015 School of Science and Engineering, Reykjavik University, Reykjavik, Iceland.
- February-March 2012 Laboratory of Chemical Reaction Complex Processes, Research Section, Institute for Advanced Energy, Kyoto, Japan.
- February 1997 Instituto de Ciencia de Materiales de Aragon (ICMA) Zaragoza, Spain.
- June 1994 NATO Advanced Study Institute on Interstitial Alloys, Il Ciocco, Italy.
- September 1994 Laboratory of Magnetism, Institute of Physics of the Chinese Academy of Sciences, Beijing, China.
- June 1990 Laboratoire de Magnétisme, C.N.R.S., Grenoble, France.

**Publications** 75 ISI Web indexed papers

**Referee** APS, ACS and Elsevier journals

**Scientific award** 1990, Constantin Miculescu Prize for Physics of the Romanian Academy of Sciences.

**Date** July, 2025