

Rita Magri, became associate professor of Physics of Matter at the University of Modena and Reggio Emilia, Italy, in 2010. She obtained in 2016 the ASN eligibility for a full professor position. Before she was Assistant Professor at the same university for 18 years.

2002 Obtained the qualification to be Professeur des Universités (section 28) –reconfirmed in year 2006 France

## EDUCATION

Master degree in Physics, mark summa cum laude, in 1985, thesis: “Dielectric Function for the Anderson Hamiltonian”, Università di Modena e Reggio Emilia

PhD in 1990, thesis: “Electronic and Structural Properties of Semiconductor Superlattices”, Università di Modena e Reggio Emilia.

## POST-DOCTORAL EXPERIENCES

From Nov. 1, 1989 to April 30th 1991, Postdoctoral Fellow and Research Assistant at the Solar Energy Research Institute (SERI) (now National Renewable Energy Laboratory), in Golden, Colorado, USA, in the group of Dr. Alex Zunger. In the USA she studied the thermodynamic stability and electronic properties of semiconductor random alloys and super-structures with long and short range order. She applied approaches, like the cluster expansion method and the special quasi random structures to predict different alloy properties (total energies, Madelung energies, electronic band gaps, densities of electronic states).

From 1991 to 1992 postdoctoral fellow at the Simon Fraser University, Burnaby, Canada, in the group of Prof. J. Dahn on the calculation of the electronic properties of graphite-boron binary compounds for applications to anodes in lithium ion rechargeable batteries.

## VISITING PROFESSOR ABROAD

November 2005-February 2006 - Senior scientist at the National Renewable Energy Lab., NREL, in Golden, Colorado, USA, funded by DOE (Department of Energy, USA).

2003 – 1 month at the Walter Schottky Institut, Munich, Germany, in Prof. Vogl. Group. Funded by WSI.

2002-2003 – Six months as poste rouge at CNRS in Dr. Paul Voisin group, LPN-CNRS, Marcoussis, France.

2000 – Four months as visiting professor in Dr. Paul Voisin group at the Ecole Normale Supérieure, Paris, France, funded by CNRS.

1999 – Three months as senior scientist at the National Renewable Energy Lab. NREL in Golden, Colorado, USA, funded by DOE (Department of Energy, USA).

1995 – One month at the Physics Department, University of São Paulo, Brazil, funded by CNPQ-CNR.

## RESEARCH INTERESTS

Her research mainly focuses on:

- (A) the theoretical investigation of the structural, electronic, and optical properties of low dimensional systems and alloys, using both ab-initio methods and semi-empirical approaches.
- (B) the theory and simulation of molecular beam epitaxy growth of superlattices and nanostructures using multi-scale computational techniques.
- (C) the study of short range order effects on the band alignments and band gaps in ternary and quaternary III-V compounds.
- (D) the electronic and optical properties of zero and one-dimensional nanostructures, in particular the study of structural stability and light absorption/emission processes in semiconductor nanocrystals and nanowires.
- (E) Surface phase diagrams and stability of point and extended defects on surfaces.
- (F) Simulations of surface processes as atomic diffusion, catalytic reactions, with energy barrier calculations using (DFT+NEB) and development of multiscale methods.
- (G) Reducible and non-reducible oxides of transition metals, noble metals and lanthanides, study of oxidation states, magnetism using spin-polarized and full-relativistic DFT approaches.
- (H) Materials for Li-ion rechargeable batteries and fuel cells.

## FUNDED PROJECTS

### As PI

### INTERNATIONAL

PI Partner UNIMORE in the project EU RIA: Autonomous Polymer based Self-Healing Components for high performance Lithium Ion Batteries (BAT4EVER), 2020-2023, 10 European Partners

Partner and Local Team Leader of the European Project COST OPERA “European Network for Innovative and Advanced Epitaxy”, 2021-2025.

PI of the Italian unit in the European Project INTAS “Polarization Resolved Spectroscopy of nanostructures”, Participants : CNRS Paris, Univ. Wuerzburg, Ioffe Institut St. Petersburg, Institut de Solid State Physics Chernogolovka, Institut de Physique Kiev. 2000-2002.

PI in the bilateral project Galileo, Italy-France, “Project and Study of Semiconductor Materials for non Linear Optics and Infrared Spectroscopy Applications”, 2002-2003.

International Grant EOARD (European Office of Aerospace Research and Development), “Empirical Pseudopotential Modeling of Antimonide based III-V Nanostructures”, 2002-2004.

### NATIONAL

National Coordinator of the Project PRIN-2022 “Binders with high ionic Conductivity for fully sustainable Li-ion cells (BIONIC)”, 2023-2025.

National Coordinator of the Italian National Project PRIN 2007, “Bridging the gap between experiment and theory: towards the control of growth and properties of semiconductor nanostructures” involving the National Research Council (CNT) and the University of Tor Vergata, Rome, 2008-2010.

National Coordinator of the Italian INFM PAIS-CELEX Project. “Computing Electronic Excitation and Optical Spectra of Surfaces, Clusters and Interfaces from First-Principles”, involving the Universities of Tor Vergata, Rome and Milan (Statale), 2003-2004.

Unit Responsible in the Italian National Project PRIN 2005, “Spatially controlled nucleation of quantum dots for single photon emitters”, involving the Universities of Rome Tor Vergata and Florence. 2006-2008.

## LOCAL FUNDING

2009 – Won an Assegno di Ricerca annuale - Fondazione Cassa di Risparmio di Modena, Fondazione Cassa di Risparmio di Reggio Emilia Pietro Manodori e Gruppo Bancario Capitalia. Title: “Design of nanosensors based on nanostructured semiconductors”.

2018 – Mobility funding scientific collaboration Università di Modena e Reggio Emilia with Princeton University, New Jersey, USA.

2019 - FAR Dipartimentale Titolo:” Progettazione computazionale di materiali innovativi per l’energia pulita ed efficiente (PI R. Magri).

## As PARTICIPANT

Project PIANO NAZIONALE DI RIPRESA E RESILIENZA (PNRR) – MISSIONE 4 COMPONENTE 2, “Dalla ricerca all’impresa” INVESTIMENTO 1.4, Potenziamento strutture di ricerca e creazione di “campioni nazionali di R&S” on Key Enabling Technologies, funded by the European Union – NextGenerationEU – Code CN00000023. Title “Sustainable Mobility Center (**Centro Nazionale** per la Mobilita` Sostenibile – CNMS)” – Spoke 12.

Project PNRR MUR project ECS\_00000033\_ECOSISTER.

FAR Interdisciplinare Interdipartimentale FAR2016, PI Sergio Valeri Title: “Innovative (oxide-based) materials and methods for fuel cell electrodes implementation”.

FAR Dipartimentale FAR2019, Project title:”Progettazione computazionale di materiali innovativi per l’energia pulita ed efficiente”.

She has participated in many other projects.

## Competitive Projects for Computational Time

As PI :

Project RitaMagri323217542884

Project RitaMagri779857305581

Project RitaMagri227055408352

Project RitaMagri727464004372

Project RitaMagri614932491230

## B Class

Application accepted Class B: semiwire - HP10BQ6WV0

Application accepted Class B: UNDEFEAT - HP10BVENIE Validity: 28 October, 2015 to Wednesday, 28 December, 2016

Application accepted Class B: SIMBAD - HP10BUSSBF Validity: 15 August, 2018 to Sunday, 15 September, 2019

Application accepted Class B: CATCH22 - HP10B6EENN Validity: Wednesday, 14 October, 2020 to Tuesday, 14 December, 2021

Application accepted Class B: LION-CAT - HP10BBOSSA Validity: Wednesday, 27 October, 2021 to Friday, 27 January, 2023

Application accepted Class B: POLIOLIC - HP10B7S993 Validity: Monday, 7 August, 2023 to Wednesday, 7 August, 2024

## OTHER

- Referee for scientific journals
- European Projects Evaluator
- PRIN Evaluator
- Evaluator of HPC ISCRA B Projects for high-performance computation.
- Reviewer of the European Project IP “Zero Order Dimension based Industrial components Applied to teleCommunications (Zodiac)”, NMP-2004-IST-NMP-3, year 2005.
- Swedish research council (VR) Evaluator for the "Electronics, electrical engineering, semiconductor physics and photonics"-review panel NT-13, year 2018.
- Serbian National Funding Evaluator
- Program Committee at the International Conference NGS-11 Buffalo (USA) (Narrow Gap Semiconductors) year 2003.
- Co-organizer of Symposium H, E-MRS Fall Meeting, Warsaw (Polonia) 2020-2021.
- External Examiner for the PhD thesis of Stephen Rhatigan, Cork, Ireland, February 12<sup>th</sup>, 2021.
- Chairman in International Conferences (ICCMSE, Corfù, Grecia, ICCES2017, Funchal, ICCES2017, Maderia, Portogallo, GCMSN London and others)
- Organizer of Workshop Bat4ever-BigMap for the European Battery2030+, November 3rd, 2022, on-line
- Associate Editor of Frontiers in Physics, section of Photonics and Optoelectronics.

- Member of the Doctoral School Physics and Nanoscience from its institution until 2019.
- Evaluator for researcher positions (Milano Bicocca, Roma Tor Vergata, Scuola Normale di Pisa, Genova, Università di Pisa)
- Evaluator and chairman for positions of assegnista e borsista.
- Twice member of the Evaluation Commission for PhD candidate positions at the Doctoral School in Physics and Nanosciences a Modena.
- Member of the Tutorato Council in Physics (years 1994,1995,1996,1997) with secretary functions.
- Member of the Department Giunta Years 1994-1997
- Member of the **Commissione Paritetica Docenti-Studenti (CPDS) di Dipartimento from its Institution Until 2022.**
- Nell'ambito dei progetti PRIN finanziati (vedi oltre) ho invitato relatori e organizzato seminari di Dipartimento
- Among the founders and active in the H2-MORE tecnopolo on hydrogen technologies.

She is single author and co-author of more than 100 articles in international journals, and she has been an invited speaker in international workshops and conferences and a lecturer at foreign Universities.

She has taught starting 1996 many courses:

Electromagnetism and Optics for undergraduate students of Geology  
 Electromagnetism and Optics for undergraduate students of Engineering  
 Introductory Quantum Mechanics for Undergraduate Physics Students  
 General Physics: Electromagnetism for Undergraduate Physics Students  
 Vibrations and Waves for Undergraduate Physics Students  
 Electrodynamics and Optical Properties of Matter for Graduate Physics Students  
 General Physics for Undergraduate Students of Information Technology  
 Classical Mechanics and Laboratory to Undergraduate Electric Engineering Students  
 Physics of Semiconductors for graduated Physics students  
 Fundamentals of Structure of Matter for Undergraduate Physics Students  
 Quantum Physics of Matter for graduate Physics Students.

Updated 29/07/2024