

Curriculum Vitae

Prof. DOMENICO MAJOLINO

Position: Full Professor

Scientific Sector: FIS/07 - Applied Physics (to Cultural and Environmental Heritage, Biology and Medicine)

Competition Sector: 02/D1 Applied Physics, Didactics and History of Physics

Department of Mathematics and Computer Science, Physics and Earth Sciences

University of MESSINA

EDUCATION AND WORK EXPERIENCE

Prof. Domenico Majolino graduated in Physics on the 05/03/1984 at the University of Messina with the highest scores and academic honors discussing a thesis entitled "Analysis of the Rayleigh wing in supercooled H₂O: the dynamics of the hydrogen bond." From the date of graduation, he got scholarships aimed at research, PhD, during the periods and in the institutions specified as follows:

- In the periods 1/2/1985-30/6/1985, 1/7/1987-30/6/1988 and 1/3/1992-14/7/1992: scholarships CRRNSM (Regional Committee for Nuclear Research and Structure of Matter) at the Institute of Physics and at the Department of Physics of Messina University.
- From 07/01/1986 to 30/06/1987: scholarship from the CNR (National Research Council) at the Institute of Spectroscopic Techniques (CNR) of Messina.
- From 1/11/1988 to 31/10/1991: IV cycle of the PhD research in Physics held at the Department of Physics of Messina University, getting the title on 1/10/1992, discussing the thesis "Study of relaxation processes in fluid systems structured."
- From 07/15/1992 to 8/4/2001: Researcher (SSD B01A-General Physics) at the Department of Physics, University of Messina.
- In 1994, pertains to section C of the Research Unit of Messina National Institute for the Physics of Matter (INFN), in the research line "Structural properties and dynamics associated liquids and dispersed systems."
- From 9/4/2001 to 29/12/2004: Associate Professor (the SSD FIS/01-Experimental Physics) at the Department of Physics, University of Messina.
- From 30/12/2004 to 24/05/2016: Full Professor (SSD FIS/01-Experimental Physics) at the Department of Physics and Earth Sciences, University of Messina.
- From 25/05/2016 up to now: Full Professor (SSD FIS/07- Applied Physics (to Cultural and Environmental Heritage, Biology and Medicine)) at the Department of Physics and Earth Sciences, University of Messina.
- From 17/11/2017 Member of the University Commission for the coordination of access to the FIT (training, insertion and internship) paths.
- From 5/12/2016 member of the University audit group for the accreditation of the degree courses of the University of Messina.
- From 25/07/2016 member of the University Commission to award 40 scholarships to foreign students.
- Reviser for the 2011-2014 VQR (Evaluation of the Quality of Research)
- Evaluator of the 2016 joint projects for the University of Verona

TEACHING ACTIVITY

Prof. Domenico Majolino held and/or hold, at the University of Messina, the teaching duties summarized below:

- Physics 2B (Degree Course in Physics)
- Electromagnetism Theory I (Degree Course in Physics)
- Electromagnetism Theory II (Degree Course in Physics)
- Laboratory of Physical methodologies for Cultural Model B (Degree Course in Physics)
- Physical Methodologies for cultural and environmental heritage (Master of Science in Physics)
- Physics applied to cultural heritage (Degree Course in Operators of cultural heritage)
- Archaeometry (Master of Science in Archaeology of the Mediterranean)
- Integrated course in General Physics (Degree Course in Medical Technician of Medical Radiology)
- General Physics modules included in integrated courses (Degree Course of Medical Technician of Medical Radiology)
- Physics with notions of computer science (Master of Science in Medicine and Surgery)
- Applied physics (Master of Science in Dentistry and Dental Prosthesis)

The same, is also part of the teaching staff of the Doctoral School in Physics, University of Messina, within which performs the teachings of:

Optical Spectroscopy (Curricula: Structure of Matter - Physics of Soft Matter and Complex Systems-Physics Applied to Cultural Heritage)

Archaeometry (Curriculum: Physics Applied to Cultural Heritage)

Physical Methodologies in Archeology and Art (Curriculum: Applied Physics)

Acquisition and processing of experimental data (Curricula: Physics of Matter - Nuclear Physics – Applied Physics)

RESEARCH ACTIVITY

The research activity of Prof. Domenico Majolino initially involved the experimental study of the structural, dynamic and transport properties of disordered systems such as electrolyte solutions, molten salts and hydrogen bonded systems (water, isomeric alcohols, carboxylic acids and their esters, linear and star polymers) in the state of "bulk", in solution and confined within nano-porous matrices (silicate glasses and natural and synthetic zeolites), where such systems exhibit a peculiar behaviour following a competitive balance between interfacial effects and reduced dimensionality. More recently, the scientific activity has been mainly focused on the chemical and physical study of structural and dynamic properties of supramolecular systems of biophysical interest, with particular regard to drug/carriers systems having suitable solubility and stability characteristics for their application in the pharmaceutical field. The focus was mainly on inclusion complexes with both native and modified cyclodextrins and nanoaggregates systems, able to encapsulate different drugs and able to control their release. These formulations make also possible the administration by alternative routes. The interpretation and correlation of the experimental data provided a rather complete picture of the investigated system, from which it is possible to formulate hypotheses about the nature of the complex, defining its geometry and clarifying the nature of the intermolecular interactions involved, also taking into consideration the information acquired from a vast literature on the subject, which includes interdisciplinary aspects of physics, chemistry and pharmacology. In addition, Prof. Domenico Majolino has dealt with the application of numerous physical methods of experimental investigation both in the field of Cultural Heritage and Medical Physics. In the first case, the research activity carried out focused on the chemical-physical, mineralogical-petrographic and technological characterization of different types of archaeological finds, for a correct historical-geographical collocation. As regards research in the medical field, sections of biological tissues have been studied in order to highlight any spectroscopic changes between healthy tissues and those affected by pathologies of different nature (neoplasms, non-ionizing e.m. radiations, etc.). The simultaneous use of experimental methods, such as light scattering (Raman, FT-Raman), Fourier transform infrared absorption in ATR geometry (FTIR-ATR), X-Ray Fluorescence (XRF), and coulometric techniques, in the laboratories of the Department of Mathematics and Computer Science, Physics and Earth Sciences of University of Messina, diffraction and neutron scattering (elastic, quasielastic and inelastic, small angle), together with absorption, diffraction and X-ray scattering (small angle) at major European Facilities such as Laboratoire Leon Brillouin (LLB, Saclay, F), Daresbury Rutherford Appleton Laboratory (RAL ISIS Facility, Oxford, UK), Institut Laue Langevin (ILL, Grenoble, F), Forschungs-Neutronenquelle Heinz Maier-Leibnitz (FRM II, Garching, D), Budapest Neutron Center (BNC, Budapest, H), Bucharest National Institute of Materials Physics (NIMP, Bucharest, RO), European Synchrotron Radiation Facility (ESRF, Grenoble, F), and Elettra Sincrotrone Trieste (Basovizza, Trieste, I), revealed successful for the understanding of these issues.

Prof. Domenico Majolino is the author of 213 publications in international refereed journals.

Bibliometric indicators from Scopus:

Number of publications: 220

H-index: 29

Total citations: 3080

He has produced, in addition, more than 100 invited talks and Communications to National and International Conferences.

NATIONAL AND INTERNATIONAL GRANTS (AS PRINCIPAL INVESTIGATOR)

- Research Unit Responsible in COFIN 2003 (financial years 2003-2004) for the Unit of Messina for the research "Spectroscopic studies of the dynamic properties of water confined in restricted geometries" under the Programme of Scientific Research of Relevant National Interest (PRIN) titled "Confined water: structure and dynamics." 24 months. Total co-financing: 67200 Euros.
- Scientific Responsible of the Research Program "Structure and dynamics of pure and confined complex systems" funded on 373301 Chapter of the Sicilian Region (financial year 2006). 12 months. Financing: 21600 Euros.
- Scientific Responsible of the Research Program "Methodological protocol of non-invasive and micro-destructive analysis for characterization of Sicilian ceramic findings" funded on 373301 Chapter of the Sicilian Region (financial year 2011). 12 months. Financing: 14880 Euros.
- Scientific Coordinator for the University of Messina for the project proposal on Action 1.2.3 within the PO-FESR Sicily 2014-2020. Title of the project proposal: Advanced Technologies for Cultural Tourism in Sicily (TEC4ART). Thematic Area: Tourism, Culture and Cultural Heritage. Duration: 3 years.

NATIONAL AND INTERNATIONAL ACKNOWLEDGMENTS

- Member of the Area Committee for the Physical Sciences (02) (DR 107 of 02.08.2000) for the evaluation of research programs of the University of Messina.

- Organizer and Coordinator of the Symposium "Structural and dynamical properties of complex fluids confined in nanoporous matrices" within the INFMeeting 2001 (June 18-22, 2001).
- Member of the Area for the Physical Sciences (02) (Decree of 26/2/2002) for the assessment of grants for cooperation in research activities of the University of Messina.
- Chairman of the Evaluation of Teaching (academic years 2004/05, 2005/06, 2006/07) of the Faculty of Sciences University of Messina.
- Scientific Responsible for CNISM (National Interuniversity Consortium for the Physical Sciences of Matter) of the research line ME 2.2 for the thematic area "Liquids and molecular biological materials."
- Member appointed to the Joint Committee for Guidance and Control for the management of business incubator of the University of Messina (DR No. 7389 of 02/02/2011).
- Coordinator of the Undergraduate (DR 3776 of 7/11/2007) and Master (DR 3788 of 7/11/2007) Degree in Physics for the four academic 2007/08- 2011/12.
- Member of the Board of the Department of Physics and Earth Science (academic years 2012/13-2014/15).
- Delegate of the Director of the Department of Physics and Earth Sciences in educational activities.
- Delegate of the Rector to Teaching for Science and Technology Area (DR n. 2354 of 10.17.2013).
- Member of the commission for the National Scientific Qualification for the competition sector 02/D1- Applied Physics, Didactics and History of Physics in execution of jurisdictional measures.
- Reviewer for the evaluation of research projects of neutron spectroscopy NCNR-NIST (National Institute of Standards and Technology-Center for Neutron Research-U.S. Department of Commerce).
- Reviewer of several international journals dell'Elsevier Science (NL), Institute of Physics (UK), the American Chemical Society (USA), American Institute of Physics (USA) and the Taylor & Francis Group (UK).
- Delegate of the Rector to Teaching Evaluation and e_Learning (DR n. 973 of 21/05/2018).
- Responsible of the Physics Section for the Department of Mathematical and Computer Sciences, Physical Sciences and Earth Sciences, University of Messina.
- Ordinary member and member of the Presidential Committee of the Peloritana Academy of Pericolanti - Class of Physical, Mathematical and Natural Sciences.