

Associate Professor of Physics
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PROFESSIONAL INTERESTS

My scientific activity was devoted mainly to the study of the linear and nonlinear optical properties, of the second and third order, of dielectric and semiconducting materials. In particular I studied quantum confined systems, amorphous semiconductors, organic side-chain and conjugated polymers, molecular solids, guest-host systems. In the case of organic polymers, I studied extensively the first (Pockels) and second order (Kerr) electro-optics properties of thin films. I also carried out research on the fabrication and characterization of organic light emitting diodes and organic solar cells. During the last three years my attention focused on biophotonics, in particular the application of Bloch surface waves (BSW) on photonic crystals for early diseases detection. The Bloch surface wave concept has also been adapted to gas detection with porous silicon photonic crystals and to photon engineering in dye sensitized solar cells. Recently I also studied the propagation of surface plasmon polaritons (SPP) on thin transparent conducting oxides.

Since 1997 I have been coordinating scientifically and technically the Molecular Photonics Laboratory of the SAPIENZA University of Rome. My principal educational goals are to guide the professional development of members of my research group and to stimulate an interest through teaching and community outreach programs.

EDUCATION

SAPIENZA Università di Roma, Roma, Italy
Ph.D. in Electromagnetism, September 1993
Thesis: Nonlinear Integrated Optics
Advisor: Prof. Mario Bertolotti

SAPIENZA Università di Roma, Roma, Italy
M.S. in Physics *cum laude*, June 1989
Thesis: Prism coupling in semiconductor doped glass waveguides
Advisor: Prof. Mario Bertolotti

PROFESSIONAL EXPERIENCE

SAPIENZA Università di Roma, Dipartimento di Scienze di Base ed Applicate per l'Ingegneria, Roma, Italy
Associate Professor of Physics, November 2002 – Present

SAPIENZA Università di Roma, Dipartimento di Scienze di Base ed Applicate per l'Ingegneria, Roma, Italy

Associate Professor of Laboratory of Biophotonic Devices, November 2008 – Present

SAPIENZA Università di Roma, Dipartimento di Energetica, Roma, Italy

Research Fellow of Physics, August 1993 – November 2002

Group Leader: Prof. Mario Bertolotti

CNET of France Telecom, Laboratoire d'Optique Quantique et Moléculaire LPQM, Paris, France

Visiting Research Fellow, September 1994 – July 1995

Group Leader: Prof. Joseph Zyss

Fraunhofer Institut für Angewandte Optik und Feinmechanik IOF, Jena, Germany

Visiting Research Fellow, Several 1-2 months visiting period between 1994 and 2010

Group Leader: Dr. Andreas Bräuer

University of Sheffield, Sheffield Centre for Molecular Materials, Sheffield, United Kingdom

Visiting Research Fellow, September 1997

Group Leader: Prof. Donal D.C. Bradley

University of Salford, School of Computing, Science and Engineering, Salford, United Kingdom

Visiting Research Fellow, May 1991

Group Leader: Prof. Allan D. Boardman

PATENTS

Italian Patent “*Dispositivo sensore di gas a struttura fotonica operante mediante onde di superficie di Bloch e relativo procedimento di fabbricazione*” (Gas sensing device based on a photonic structure operating by means of Bloch surface waves and fabrication procedure) by Descrovi E., Giorgis F., Geobaldo F. and Michelotti F. (Politecnico di Torino 70% and Sapienza 30%), under PCT extension (2011)

INDEPENDENT THINKING AND LEADERSHIP QUALITIES

Since 1997 he is coordinating scientifically, technically and didactically the Molecular Photonics Laboratory at the University of Rome “La Sapienza”. He handled personal scientific collaborations with several research groups around the world, such as Ecole Normale Supérieure de Cachan (F) (Prof.Zyss), Fraunhofer Institute for Applied Optics and Precision Engineering di Jena (D) (Dr.Bräuer), Bell Laboratories - Lucent Technologies (USA) (Dr.Bao), Imperial College in London (Prof.Bradley), Department of Electronics of the University of Twente (NL) (Prof.Driessen), ETH-Zurich (CH) (Prof.Guenter) and Politecnico di Torino (Prof.Pirri).

FUNDED PROJECTS

- 2002 European Union – 5th Framework Program – Project: Next Generation Active Integrated Optic Subsystems (NAIS) - IST-2002-28018 - Coordinator of the unit at Università di Roma "La Sapienza" and Member of the Management Board.
- 2002 INFN (National Institute of Matter Physics) – Project: PAISNAIS – Coordinator of the project.
- 2008 SAPIENZA University Research Program – Project: Design, Fabrication and characterization of photonic nanostructures for bio-sensing applications - Coordinator of the project.
- 2009 - SAPIENZA University Research Program – Project: Fabrication of gas sensors by means of porous silicon photonic crystals - Coordinator of the project.

- 2009 Piedmont Region – Project: Photonic Biosensors for early cancer diagnostics (PHOENICS), Coordinator of the sub-unit at the Università di Roma "La Sapienza".
- 2011 Italian Ministry of University and Research, FIRB Program – Project: NEWTON, Coordinator of the sub-unit at the Università di Roma "La Sapienza".
- 2012 7th Framework Program – Project: BILOBA – Bloch electromagnetic surface wave Bio-sensors for early cancer diagnosis, 318035 - Coordinator of the Project.

TEACHING EXPERIENCE

- From 1992 to 2002 he was researcher in Physics at the University of Roma "La Sapienza". As a researcher he taught the courses of General Physics 1 and 2 of the Engineering Faculty. The teaching activity included seminars in the frame of the courses of Atomic Physics (93/94), Optoelectronics (92/93 to 95/96), Quantum Electronics (92/93 to 97/98), Optics (95/96 to 02/03).
- Since 2002 he is Associate Professor of Physics of the Engineering Faculty of the University of Roma "La Sapienza". He is teaching General Physics for students in Engineering in the field of Electronics, Telecommunications and Information Technology and Biophotonics Laboratory for the Nanotechnology Engineering MS students.

NATIONAL AND INTERNATIONAL SERVICE

He organised several international congresses and summer schools (Summer School "*Advances in integrated optics*", Erice 1993, Secretary; Congress "*Materials for Nonlinear Optics*" of the European Optical Society, Capri 1997, Secretary; Symposium H "*Optoelectronics II: Molecular Photonics - From macroscopic to nanoscopic applications*" Spring Meeting of the European Materials Research Society, Strasbourg 2000, Chairman; Summer School "*Microresonators as building blocks for VLSI photonics*", Erice 2003, Director; "9th European Conference on Application of Polar Dielectrics", Roma 2008, Chairman).