

**Education/Professional Experience:**

1999 – present: Associate Professor of Physics at Politecnico di Torino, DISAT  
2015 – 2016: Visiting professor at MIT-Dept of Materials Science (prof. J.Grossman)  
1990 – 1999: Assistant Professor of Physics at Politecnico di Torino, Dipartimento di Fisica  
1984 – 1990: Technical Assistant (VII level) at Politecnico di Torino, Dipartimento di Fisica  
1983 – 1984: Post-graduate grant “Eligio Perucca” at Politecnico di Torino, Dipartimento di Fisica

**Scientific expertise:**

After graduation in Nuclear Engineering at Politecnico of Torino, in 1981, she has been employed in Politecnico from 1984, in the former Department of Physics, now Department of Applied Science and Technology. She is Associate Professor in General Physics from November 1st, 1999. She has been and at this time is scientific responsible of national and international projects in the fields of semiconductors physics and technology, she has been involved in the organization of numerous workshops and schools. The research activity is experimental, in the structure of the matter, in particular in the last years on nano-structured materials for energy applications. Since 1980 she has worked in amorphous silicon-based electronic devices such as diodes and solar cells. Her research interests are in the field of advanced materials for optoelectronics, thin films growth and characterization, micro-electronics and micro-mechanics technologies, energy harvesting and energy storage devices. From the beginning she's member of the Research Group “Materials and Processes for Micro and Nanotechnologies”, where she's involved in the research activity line “Energy”. The main subjects of her research are (in chronological order):

- Thermophotovoltaic (TPV) conversion: project and realization of a prototype of TPV converter in which the sun radiation is concentrated on a black-body emitter and, through an interference filter, sent to solar cells for conversion in electricity
- Multilayers optics: elaboration of programs for optimizing multilayer coatings.
- Amorphous and microcrystalline films in silicon, carbon, nitrogen and hydrogen for optoelectronic devices applications, in particular for II generation solar cells: deposition, characterization and optimization, small prototypes fabrication
- Buffer layers for integrated semiconductor-superconductor electronics: magnetron sputtering deposition techniques has been used for realization of Si/CeO<sub>2</sub>/YBCO, Si/YSZ/YBCO and Si/YSZ/CeO<sub>2</sub>/YBCO multilayer structures
- Direct methanol micro-fuel cells for micro-power integrated generation in portable: study, design and fabrication of optimised flow channels able to powering methanol solution
- New generation solar cells, in particular Dye Sensitized Solar cells: conducting glass electrodes fabrication and improvement, TCO optimization; employment of carbon nanotubes; sealing. Study of the organic/inorganic interface, dye modeling
- Advanced materials for energy harvesting and storage: Graphene-based aerogels and 2D Transition Metal Dicalchogenides for supercapacitors, nanostructured electrodes for solar water-splitting reactors and microbial fuel cells
- Single Layer Graphene and Graphene Oxide

**Scientific Keywords**

Experimental physics - Physics of semiconductors - Amorphous thin films - Photovoltaic technologies - Nanomaterials for energy harvesting - Nanoscale properties of matter - Third generation solar cells - Solar cells characterization and production - Nanowires - q-dots - Organic-inorganic interfaces - 2D materials – Energy storage – Supercapacitors – Graphene-based membranes for nanofiltration

**Bibliometric indexes (at 06/11/2018)**

Author of more than 180 articles in international peer-reviewed journals and of several book chapters.

- Total number of papers: 181 (Scopus)
- Total number of citations: 2459 (Scopus)
- **h-index: 29 (Scopus)**

### Referee activities

- Referee for APS, ACS, RCS, Wiley and Elsevier journals
- Member of the International Editorial Board of "Emerging Materials Research", ICE Publishing
- Expert of the EU Commission, Referee and Rapporteur for the FP7 programs: "MATERA+" and "Future Emerging Technologies for Energy Applications-2012"
- Expert of ANR (Agence Nationale de Recherche); Referee and Rapporteur for the final evaluation of scientific projects in the field "Sciences de l'Information, de la Matière et de l'Ingénierie" from 2008
- Referee of the Qatar National Research Foundation from 2010

### Organization and Managements:

- From 1998 President of the "Foundation prof.ssa Francesca Demichelis" in memory of the prof.ssa Francesca Demichelis and devoted to help young scientists in the research field of semiconducting materials
- From 2005 to today: Scientific coordination in different exhibitions and initiatives such as "Notte dei Ricercatori", "Nanoday", "MicroNora", "Nanoforum"
- From 1996 to 2004 Scientific Coordinator of the "Scuola Nazionale di Fisica della Materia" organized every year by ISI (Istituto for Scientific Interchange) and INFM (Istituto Nazionale di Fisica della Materia) for PhD students
- From 2006 to today: Member of Scientific Committee of PhD in Electronic Devices at POLITO
- 2011-2014: Member of the "Commissione Brevetti" of Politecnico di Torino
- 2011-2015: Member of the Giunta of the DISAT

### Financed Research Projects:

As Coordinator:

- Progetto ENEA-Politecnico 2000: "Celle solari con strato p di tipo graded layer"
- MURST 2008-10: Contributi Ministeriali alla Cooperazione Interuniversitaria con la Tunisia
- RICERCA INNOVATIVA POLITO 2001: Microelettronica integrata superconduttore-semiconduttore: realizzazione di un prototipo di dispositivo risonatore per microonde a 5 GHz
- ASI (Agenzia Spazio Italiana) 2001: "High Tc IR Detectors"
- REGIONE PIEMONTE 2009: Innovative Auxiliary Steering Knob vehicle function activation for drivers with disabilities (ASK)
- ENI-POLITO Research Project (2016-2017) "Studio di fattibilità per lo sviluppo di Membrane ultrasensibili a base graphene per la purificazione delle acque salmastre da contaminanti organici"
- ENI-POLITO Research Project (2017-2018) "Membrane ultrasensibili a base graphene: scaling-up e possibili applicazioni per la separazione gas-gas"

As Unit Responsible:

- PRIN 1999: Tecnologie plasmochimiche nella produzione di film sottili di silicio e sue leghe per applicazioni elettroniche
- PRIN 2001: Tecnologie plasmochimiche per la deposizione di film nanostrutturati a base di silicio per applicazioni fotoniche e fotovoltaiche
- FIRB Progetti Autonomi 2001: Silicon micromachined photodetectors based on MgB<sub>2</sub> superconductor films
- PAIS-INFM (Sez.E) 2001: "DEBUSSY: Si/YBCO micro-electronics"
- REGIONE PIEMONTE 2010: Sviluppo di soluzioni integrate innovative per fuel cell stack da impiegare in sistemi di generazione di energia per applicazioni di back-up (MEMSEAL-FC)
- REGIONE PIEMONTE 2011: Celle fotovoltaiche DSSC flessibili basate su materiali innovativi e coloranti di origine naturale e sintetica di nuova concezione (FLEXMAT)
- REGIONE PIEMONTE 2011: Elementi di condizionamento per i sottotetti (FREE-ROOF)

### Teaching experience:

Responsible, from 2000 to today, of more than 70 Bachelor, master and PhD thesis

In the last three academic years she has been in charge of:

- the Courses of "PhysicsII" (for the Foreign Undergraduate Students of the 2<sup>nd</sup> year of Engineering),
- the Course of "Nanomaterials and nanotechnologies for energy applications" (for the students of the 1<sup>st</sup> year of Master of Science in Micro and Nanotechnologies for ICT)
- the Course of "Electronic devices" (for the Foreign Undergraduate Students of the 2<sup>nd</sup> year of Electronic Engineering),