

CURRICULUM VITAE

Passacantando Maurizio,

Associate Professor (02B1 - FIS01) at the Department of Physical and Chemical Sciences of the University of L'Aquila.

TEACHING ACTIVITY:

- Associate Professor of the University of L'Aquila for the following courses: Laboratory of Physics of Matter; Applied Physics Laboratory I and II; Materials Analysis Techniques with Laboratory; Nanotechnology Laboratory; Didactics of physics; Courses of Physics II.
- Member of Doctoral College of the Dept. of Physical and Chemical Sciences, University of L'Aquila.

EDITORIAL ACTIVITY:

- Editor of Special Issue, Journal of Non-Crystalline Solids, Volume 322 (Elsevier Science B.V., 2003).
- Member of the Editorial Board for Carbon-Based Materials of the Frontiers in Materials journal (from 2018 - to date).
- Member of the Editorial Board for Nanomaterials (from 2018 – to date).
- Reviewer of Nano Letters, Applied Physics Letters, Nanotechnology, Carbon, Small, Nanoscale, Advanced Functional Materials, Journal of Physics D: Applied Physics, Journal of Physics: Condensed Matter, Journal of Vacuum Science and Technology, 2D Materials.

SCIENTIFIC PARTICIPATION IN INTERNATIONAL AND NATIONAL FINANCED RESEARCH PROJECTS:

- PRIN 2003093440_004-Area 09; Participant;
- PRIN 2004020258_002-Area 02; Participant;
- PRIN 2005020415_003-Area 02; Participant;
- GINT (2006) project: funded by (INFN); Project Leader;
- CNR-INFN European Project NanoSci-ERA (2007), S-FIVE; Participant;
- FP7-NMP-2009-SMALL-3 contract n. 245513: NATIOMEM; Participant;
- SinPhoNIA (2009) project: funded by (INFN); Project Leader;
- TECNA4AUTO (2012) - POR FESR ABRUZZO 2007/13; Participant;
- PARIDE (start 2013) project: funded by (INFN); Project Leader;
- Prog. AQ/0016/01-02/X23 - MiSE Cratere Abruzzo; Project Leader;
- Prog. AQ/0002/01-03/X23 - MiSE Cratere Abruzzo; Participant.

RESEARCH ACTIVITY:

Its main fields of research are oriented towards: i) growth and characterization of: carbon nanotubes, semiconductive and insulating nanowires; ii) study of the electronic and structural properties of diluted magnetic semiconductors (DMS); film sensors and oxide nanostructures. He has experience in the following spectroscopy techniques: electron spectroscopy (AES, EELS and EXELFS), X-ray photoelectron spectroscopy (XPS), UV spectroscopy, X-ray diffraction and X-ray reflectometry. Some of the experiments have been also performed at synchrotron radiation facilities: ELETTRA, Sincrotrone Trieste (for XAS, UV spectroscopies), LURE, Orsay, France (for XAS and EXAFS techniques) ESRF, Grenoble, France (for EXAFS techniques). Moreover, he has considerable experience in the field of transmission electron microscopy (TEM) and scanning (SEM). In the field of scanning electron microscopy, many experiments have been carried out using nano-manipulators for the handling of nanomaterials and IV measurements, to measure electrical and field emission of nanostructured materials. He has considerable experience in the design and development of chemical vapour deposition reactors (CVD), that was used to grow: i) high and low k oxides; (ii) multiwall carbon nanotubes; iii) semiconductor nanowires; iv) 3D-carbon nanotube sponges; v) 2D material: graphene, MoS₂. In particular, optical and electrical properties of graphene/semiconductor Schottky heterojunctions. Chemical and electrical modulation of Schottky barrier. Design, fabrication and characterization of novel graphene/semiconductor devices for use as photodetector, solar cell and chemical sensors. Study of phenomena occurring at the metal/graphene interface. Fabrication and electrical characterization of field-effect transistors (FETs) based on graphene and other 2D materials and effect of contacts, geometry and environmental conditions on their performance. Carbon nanotube growth by CVD and structural characterization by electron beam techniques (SEM, TEM) and scanning probe microscopy. Investigation of field emission, conductivity and photoconductivity of graphene flakes and multiwalled carbon nanotubes. Development of an innovative technique to measure two-dimensional maps of field emission current from vertically aligned carbon nanotube films using scanning probe microscopes (AFM/STM).

Nanomanipulation of individual nanotubes and study of their electrical and mechanical properties in SEM chambers. Demonstration of freestanding carbon nanotube films as fast and sensitive thermistors. Photovoltaic effects of CNT/Si structures. Development of a photodetector relying on carbon nanotubes both for sensing and charge amplification purpose. Author of 237 publications on international peer-reviewed journals. SCOPUS (on July 5, 2021): h-index (41); Citations (5295);

RESULTS OBTAINED IN THE TECHNOLOGY TRANSFER

- Participation in the CASTI Laboratory at the University of L'Aquila (INFM project)
- Member of the Administration Council of the spin-off "Nano-cat s.r.l." at the University of L'Aquila.
- Director of the "Structural Properties of Solids" Laboratory - Technology Transfer of the University of L'Aquila.