FINAZZI Marco

Marco Finazzi

Web site: http://www.fisi.polimi.it/it/personale/finazzi

CURSUS STUDIORUM

1994 PhD in Physics, Politecnico di Milano, Italy.
1989 Laurea Degree in Electronic Engineering, Politecnico di Milano, Italy.
1985 Maturity degree (final evaluation: 60/60), Liceo Scientifico Galileo Galilei, Palazzolo sull'Oglio (Bs)

PROFESSIONAL ACTIVITY

2015 – to date Full professor – Physics Department, Politecnico di Milano, Italy.
2005 – 2015 Associate professor – Physics Department, Politecnico di Milano, Italy.
2012 National Scientific Qualification for 1st level professorship in Experimental Physics of Matter (SC 02/B1).
2002 – 2005 Assistant Professor – Physics Department, Politecnico di Milano, Milano, Italy.
2000 – 2002 Adjunct Professor, Università Sacro Cuore, Brescia, Italy.
1998 – 2002 Scientist of the Istituto Nazionale di Fisica della Materia (INFM) –ELETTRA Synchrotron Radiation Facility, Trieste, Italy.
1996 – 1998 Post doc – European Synchrotron Radiation Facility, Grenoble, France.
1994 – 1996 "Marie Curie" fellow, "Human Capital and Mobility" – Laboratoire pour l'Utilisation du Rayonnement Electromagnétique (LURE), Orsay, France.
1993 – 1994 Post doc – Centre National pour la Recherche Scientifique (CNRS), Orsay, France
1993 Grant – Laboratoire pour l'Utilisation du Rayonnement Electromagnétique (LURE), Orsay, France.

SCIENTIFIC ACTIVITY

Marco Finazzi's research activity spans a time lapse of about 25 years and can be classified within the field of Nano-Science and Technology. Many research fields have been investigated, from magnetism of thin films and interfaces to spintronics, and from scanning probe microscopy to nano-optics. Although most of the activity has been experimental, several theoretical works, either numerical or analytical, have also been published.

The experimental activity has been conducted either on campus at the Physics Department of Politecnico di Milano, or at large scale synchrotron radiation facilities (LURE - Orsay, France, Elettra - Trieste, ESRF - Grenoble, ALS - Berkeley, BESSY - Berlin). Both types of activities have often required the realization of ad hoc advanced scientific instrumentation. In this context, it should be reminded that Marco Finazzi was hired (1996-1998) at the European Synchrotron Radiation Facility (ESRF), Grenoble, France, to develop the instrumentation of the experimental station of the soft X-ray beamline ID12B and to give assistance to users: in two years, about 50 experiments have been performed by groups from all Europe.

The recent scientific activity can be roughly divided along the following principal lines:

Scanning tunneling microscopy and spectroscopy of low-dimensional systems

Electronic and magnetic properties of matter stem from the local organization of the elemental constituents. This has led in 2006 to opening a new research line at the Physics Department of Politecnico di Milano dedicated to Scanning Tunneling Microscopy.

- Study of the contrast mechanisms for scanning tunnelling microscopy on thin oxide films.
- Stable alignment of tautomers at room temperature in porphyrin two-dimensional layers.
- Morphologic and electronic properties of ultrathin oxide films (CrO, FeO, CoO, NiO).
- Surfactant action of oxygen in the growth of transition metal films.

Nano-optics and plasmonics

In 2003, Marco Finazzi contributed to funding the nano-optics/scanning probe microscopy laboratory at the Physics Department at Politecnico di Milano, dedicated to studies of the optical properties of nano-systems and super-resolution microscopy. In this frame, particular emphasis has been dedicated to nonlinear nano-optics and to the study of polarization in the near field of nanostructures.

- Study of planar waveguides as quantum mechanical analogs (Zeno effect, wave packet collapses and
- revivals in a quantum bouncing ball).

- Macroscopic movement of azo-polymer chains by near-field probes.
- Near-field polarization and chirality.
- Self-organization in polymeric thin films.
- Kerr and Faraday microscopy on magnetic materials.
- Semiconductor-based nano-optics and plasmonics.
- Nonlinear nano-optics.

Spintronics

Spintronics is the new branch of Physics aiming at exploiting the spin of the carriers to transport and manipulate information. In 2013, Marco Finazzi contributed to funding the SemiSpin laboratory at the Physics Department at Politecnico di Milano, dedicated to the study of the generation and transport of spin-polarized electrons in semiconductors.

- Excitation of spin-polarized electron with circularly polarized light in GaAs, Ge and Si.
- Study of spin-charge conversion through the Inverse Spin-Hall Effect in Pt films coupled to GaAs, Ge and Si.
- Demonstration of a spin cell generating a spin photovoltage by exploiting metal nanostructures on Ge and GaAs.

INSTITUTIONAL RESPONSIBILITIES

2013 – to date Vice-coordinator of the PhD School in Physics. Politecnico di Milano, Italy.
2013 – to date Responsible for the spin-in-semiconductors (SEMISPIN) laboratory at the Physics Department,
Politecnico di Milano.
2003 – to date Responsible for the nano-optics and scanning optical microscopy (SNOM) laboratory at the Physics Department, Politecnico di Milano.

COMMISSIONS OF TRUST

2012 – 2013 Review panel member for the National Interest Research Project call, Ministry of University and Scientific Research, Italy
2012 – 2013 Review panel member for the Italian Fund for Fundamental Research call, Ministry of University
and Scientific Research, Italy
2013 Scientific Evaluation, Swiss National Science Foundation, Switzerland.
2015 Scientific Evaluation, German Research Foundation, Germany.

PUBLICATIONS

205 publications on international peer-reviewed journals
2 research monographs: