Andrea Migliorini

Curriculum Vitæ

via Foroni 10
37122 Verona VR, Italy
Mobile: +34 671496421
Phone: +39 349 6506786
Andrea.Migliorini@mail.polimi.it

Objective

Goal Pursuing a PhD student position in a top research institution or university in nanotechnology.

Research Interests
- Spintronics and Magnetic Materials
- Nanotechnology for Energy Sustainability (e.g. Photovoltaics, Fuel Cells, Energy Storage)
- Thin Films (Physics and Technology)

Education

2010 – 2013 **M.S. Degree in Physics Engineering**, *Politecnico di Milan*, Milan, Italy.
Selected as one of the first participants in the newly formed EAGLES International Exchange Program between Politecnico di Milano (Italy), Drexel University (USA), Universidad Politécnica de Madrid (Spain)
Key subjects: Solid State Physics, Photonics, Low Dimensional Systems, Nanotechnology, Photovoltaics, Electron and Atomic Force Microscopies.
Anticipated Graduation Date: July, 2013

2011 – 2012 **M.S. Degree in Mechanical Eng. & Mechanics**, *Drexel University*, Philadelphia, PA, USA.
Studies and research as part of EAGLES International Exchange Program
Key subjects: Heat Transfer, Plasmas, Statistical Mechanics, Computer Science, Mathematics.
GPA: 3.83/4.00

2007 – 2010 **B.S. in Physics Engineering**, *Politecnico di Milan*, Milan, Italy.
Key subjects: Fundamental Physics, Quantum Mechanics, Optics and Laser, Material Science, Mathematics, Electronics.
Final score: 108/110

2002 – 2007 **Scientific High School Diploma**, *Liceo Scientifico Statale Galileo Galilei*, Verona, Italy.
Achievements: Member of school team for participation in Mathematics Olympics.
Final score: 100/100

Master's Thesis

Topic ***Optimization of Spin Valves for High Magnetoresistance CPP Electronic Nanodevices***

Supervisors Dr. Franco Ciccacci — *Politecnico di Milano, Milan, Italy*
Dr. Jose Luis Prieto — *Universidad Politécnica de Madrid, Madrid, Spain*

Description Fabrication of Current Perpendicular-to-Plane (CPP) Spin Valve nanodevices has been achieved. Spin Valves have been grown through Magnetron Sputtering Deposition and their magneto-electrical properties have been optimized after electrical characterization. A CPP configuration has been achieved through Photolithography, Inductively Coupled Plasma Reactive-Ion Etching (ICP-RIE) and Magnetron Sputtering Deposition. The nanodevices have been characterized through Four-Terminal Sensing transport measurments and Magneto-Optic Kerr Effect Microscopy.

Experience

2012 – 2013 **Research Assistant**, *Grupo de Dispositivos Magnéticos (GDM)*,
ISOM, Universidad Politécnico de Madrid, Madrid, Spain.
Research Project: Spin Valves for CPP Electronic Nanodevices.

- Design of thin film layer stacks
  - Layer structure & materials to create "Spin-Valve" structures
  - Optimization for Magnetoresistance and Exchange Bias
  - Understanding of quantum theories of ferromagnetism & giant magnetoresistance
- Film Stack Deposition
  - D.C. & R.F. Magnetron Sputtering
  - Clean room procedures (class 100-1000)
  - Substrate preparation & cleaning
  - Nano-Lithographic techniques (Electron Beam Lithography)
- CPP Device Fabrication
  - Thin film stack deposition, via a combination of R.F. & D.C. sputtering
  - Design and nano-lithography of contact patterns and wire geometry
  - Inductively Coupled Plasma Reactive-Ion Etching (ICP-RIE)
- Characterization
  - 4T sensing
  - Ultrasonic Wire Bonding (wedge-type)
  - Vibrating Sample Magnetometry
  - Electronic measurements

2010 **Student Research Experience**, *Physics Department*,
Politécnico di Milano, Milan, Italy.
Research Project: Measurement of Superconducting Transition in Type-II Superconducting Materials (YBCO)
Project Lead: Dr. Ermanno Pinotti — Politecnico di Milano

- Experimental
  - Cryogenic (LN) cooling
  - Measurement of zero electrical DC resistance
  - Transition temperature measurement
  - Meissner effect measurements
  - H-T curves and analysis
  - Josephson effect
  - Flux tubes
- Main Competencies
  - Superconductivity and superconductive materials
  - Thermocouples
  - 4T sensing
  - R-L Circuitry

Equipment Training & Experience

- R.F. & D.C. Magnetron Sputtering
- Vibrating Sample Magnetometry
- Inductively Coupled Plasma Reactive-Ion Etching (ICP-RIE)
- Ultrasonic Wire Bonding (wedge-type)
- Photolithography
- Ultra-High Vacuum System Maintenance
- Energy-dispersive X-ray Spectroscopy
- Magneto-Optic Kerr Effect Microscopy
- Clean room procedures (class 100-1000)

Computer skills

Languages MATLAB, LaTeX

Tools Origin, Abaqus (FEM), LabView, LaTeX,
Microsoft Office Suite

Spoken Languages

Italian Native Tongue

English Fluent *(2012, IELTS: 7.5 of 9.0)*
Sept. 2011 – Jul. 2012: Studies in Philadelphia, PA, USA

Spanish Fluent
Summer 2010: Stay in Barcelona, Spain
Nov. 2012 – Jul. 2013: Research work at UPM in Madrid, Spain

Personal Interests

Energy Nanoscale structures and materials for high-efficiency photovoltaic devices and energy storage applications.

Physics Quantum Mechanics, Magnetism and Spintronics, Superconductivity, Quantum Information, Photonics.

Hobbies Volunteering, Politics, Basketball, Soccer, Sailing, Culinary Arts, Guitar, Piano.