

Andrea Migliorini

Curriculum Vitæ

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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

- Title ***Spin Valves for 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 Inductively Coupled Plasma Reactive-Ion Etching (ICP-RIE) and Magnetron Sputtering Deposition.

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)
- Lock-in amplifiers
- 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.