

Federico Chinni

Curriculum vitae

Via Torleone 24, Bologna (Italy)

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Personal Information

Date of Birth Porretta Terme, Nationality Italian
March 2th, 1989
Residence Bologna, Via Torleone 24 Marital Status Single

Education and Training

- 2008 **Scientific high school diploma**, *Scientific high school "L. Da Vinci"*, Porretta Terme.
- 2012 **Bachelor's degree in Physics**, *University of Bologna*, (105/110).
- 2014 **Master's degree in Condensed Matter Physics**, *University of Bologna*, (110 cum laude).

Schools and Conferences

- Introductory Course on Magnetic Random Access Memories (InMRAM) Grenoble-Minatec 2-4 July 2014 (France)
- 'Il Magnetismo "attrae" l'Impresa' Area della Ricerca CNR Bologna, 25 February 2014 (Italy)

Publications

- F. Spizzo, E. Bonfiglioli, M. Tamisari, A. Gerardino, G. Barucca, A. Notargiacomo, F. Chinni, L. Del Bianco "**Magnetic exchange coupling in IrMn/NiFe nanostructures: from the continuous film to dot arrays**" (submitted to PHYSICAL REVIEW B)

Research Interests

- Experimental condensed matter physics
- Syntesis of nano-sized systems (films, spin-valves, nanoparticles, patterned structures)

- Magnetic properties of nano-sized systems, magnetization processes and their investigation (SQUID and magneto-optic Kerr effect magnetometry), finite-size effects, magnetic interactions effects, exchange-coupling, magnetoresistance, micromagnetic simulations
- Advanced materials for applications in magnetoelectronics/spintronics, magnetic recording, magnetic sensors

Languages

Italian **Mother Tongue**
 English **Reading skills: Good, Writing skills: Fair, Verbal skills: Fairly good**

Computer Skills

Systems	Macintosh, Windows	Codes	Basic knowledge of C++
Programs	Microsoft Office	Computer Packets	Origin, Igor, OOMMF (Object Oriented Micromagnetic Framework)
Typography	\LaTeX		

Enclosures

- 1 Abstract of Bachelor's degree in Physics
- 2 Abstract of Master's degree in Condensed Matter Physics
- 3 Exams given during the Master's degree in Condensed Matter Physics

Enclosure 1: Abstract of Bachelor's degree in Physics

Title Study of new organic scintillators for the detection of neutrons in nuclear physics.

Supervisor Prof. Mauro Bruno

co-Supervisor Dr. Fabiana Gramegna

Exam date 13 July 2012

Abstract

The thesis was mainly carried out at the Department of Physics and Astronomy of Bologna University and at the National Laboratories in Legnaro.

It deals with the study of the couplings scintillator-photomultiplier and scintillator-avalanche photodiode when subjected to radiations (alpha and gamma) under different experimental conditions (different concentrations of dopants within the scintillators used for the measurements). When the accelerator was put into operation, it was possible to study these couplings when subjected to neutrons.

The particular interest of this work derives from the use and study of photomultipliers and avalanche photodiodes characterized by higher efficiency in the red part of the spectrum.

Enclosure 2: Abstract of Master's degree in Condensed Matter Physics

Title Magnetic exchange coupling and spatial confinement in IrMn/NiFe films and nanodots
Supervisor Dr. Lucia Del Bianco
co-Supervisor Dr. Federico Spizzo
Exam date 18 July 2014

Abstract

The thesis was mainly carried out at the Department of Physics and Astronomy of Bologna University and the Department of Physics and Earth Science of Ferrara University.

The exchange bias (EB), phenomenon that manifests itself as a shift of the ferromagnetic hysteresis loop along the field axis, occurs when a ferromagnet (FM) and an antiferromagnet (AFM) are coupled by interfacial exchange interaction. Its study, especially in nanostructures, is interesting both from a phenomenological point of view and for technological applications. In the theoretical models, the reduction of the lateral size in FM/AFM systems can lead to substantial changes in the entity of the shift of the loop and in the coercitivity. From a technological point of view, the study of the EB effects is encouraged by the great development of magnetic storage and spintronics; reading heads are typically composed of spin-valve or tunnel junction structures, in which FM/AFM exchange biased bilayers constitute an essential part. Moreover, recently it has been shown that the exchange FM/AFM interaction can be used to improve the stability of magnetic recording media.

This thesis deals with the EB properties of the $IrMn/NiFe$ system in form of continuous film and arrays of square dots of the same composition, but with different size (1000, 500 and 300 nm), in order to understand how the spatial confinement influences the mechanism of interface exchange coupling and its magnetothermal evolution. The samples were prepared by electron beam lithography and dc-magnetron sputtering and they were subjected to structural investigations by electron microscopy techniques. The magnetic properties of the continuous film and the dot arrays were investigated by longitudinal magneto-optic Kerr effect (MOKE) magnetometry, technique extensively illustrated in the thesis.

Finally, experimental results have been combined to micromagnetic simulations, so as to get a complete description of the EB effect in the $IrMn/NiFe$ system.

Enclosure 4: Exams given during the Master's degree in Condensed Matter Physics

COMPLEMENTI DI STRUTTURA DELLA MATERIA	27/30
FISICA DEI RAGGI X E LUCE DI SINCROTRONE	30/30
FISICA DELLE PARTICELLE	30/30 cum laude
FISICA DELLO STATO SOLIDO 1	30/30
FISICA DELLO STATO SOLIDO 2	30/30
LABORATORIO DI FISICA DELLA MATERIA 1	30/30
LABORATORIO DI FISICA DELLA MATERIA 2	30/30
MATERIALI MAGNETICI	30/30
REAZIONI NUCLEARI	30/30 cum laude
RELATIVITA' 1	30/30
SEMICONDUTTORI E SISTEMI A BASSA DIMENSIONALITA'	30/30
TEORIA QUANTISTICA DELLA MATERIA	30/30 cum laude

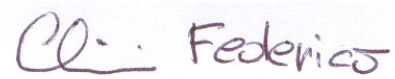
Referents

- Dr. Lucia Del Bianco, Department of Physics and Astronomy, University of Bologna, lucia.delbianco@unibo.it
- Dr. Federico Spizzo, Department of Physics and Earth Science, University of Ferrara, spizzo@fe.infn.it
- Prof. Mauro Bruno, Department of Physics and Astronomy, University of Bologna, bruno@bo.infn.it

Il sottoscritto è a conoscenza che, ai sensi dell'art. 26 della legge 15/68, le dichiarazioni mendaci, la falsità negli atti e l'uso di atti falsi sono puniti ai sensi del codice penale e delle leggi speciali. Il sottoscritto acconsente, ai sensi del D.Lgs. 30/06/2003 n. 196, al trattamento dei propri dati personali. Il sottoscritto acconsente alla pubblicazione del presente curriculum vitae sul sito dell'Università di Ferrara.

Bologna, January 23, 2015

In fede:

 Federico