

Stefania Miglio

Higher Education

April 2005: PhD degree in Materials Engineering at University of Florence, performing a research study titled: “*Electrical and sensing properties characterization of nanostructured carbon films obtained by Supersonic Cluster Beam Deposition*”. Tutors: Prof. Ing. Tiberio Bacci and Prof. Mara Bruzzi

The aim of the work was the characterization and modelling of electrical properties of nanostructured carbon films produced by pulsed microplasma cluster source. The possible application as base materials for gas and humidity sensors has been also investigated.

March 2005: Holder of a Post Doc research fellowship granted by “Fondazione Angelo Della Riccia” (Italy) to perform a stage of 5 months at Institut National de la Recherche Scientifique, INRS-Énergie, Matériaux et Télécommunications, Varennes, Québec, Canada.

Supervisors: Prof. F. Rosei and Prof. M.A. El Khakani

The aim of the project is to study the possible application of carbon nanotubes deposited by Pulsed Laser Deposition as gas and humidity sensors working in resistive configuration.

2001: Holder of a Research fellowship titled: “ Nanostrutture di carbonio da aggregazione di clusters per applicazioni avanzate” (“Cluster assembled nanostructured carbon films for advanced applications”) at Department of Energetics, University of Florence, Supervisor: Prof. Emilio Borchì.

This research work has been performed in order to study the electrical properties of nanostructured carbon films and to test if they were suitable for gas sensing applications.

20/06/2000: Laurea degree in Physics (equivalent to Master) at the University of Florence obtained with grade 101/110 defending a thesis entitled:

“*Analisi delle proprietà elettriche ed ottiche di rivelatori a diamante CVD irraggiati con neutroni*” (Tutor: Prof. Emilio Borchì, Co-Tutor: Prof. Marcello Colocci).

(“*Anayisis of electrical and optical properties of neutron irradiated CVD diamond detectors*”)

Thesis work carried out within the international RD42 (*Diamond Tracking Detectors for LHC*) collaboration at CERN (*European Laboratory for Particle Physics*, Geneve), concerning:

- ◆ Optical characterization of CVD (Chemical Vapour Deposited) diamond films by means of micro-Raman and photoluminescence spectroscopy, performed at LENS (*European Laboratory of Non-linear Spectroscopy*) in Florence
- ◆ Electrical measurements of the CVD diamond detectors performed at

NIKHEF (National Institute for Nuclear and Particle Physics) in Amsterdam (NL); in particular, the ccd (Charge Collection Distance) of the detectors has been measured before and after fast neutron irradiation, with fluences up to $2.0 \cdot 10^{15} \text{ n/cm}^2$.

- ◆ Study of defects as a function of neutron irradiation by means of thermal spectroscopy (TSC, Thermally Stimulated Currents) at the Physics Laboratory, Department of Energetics, University of Florence.

The interest and study of defects in CVD diamond has been continued as well after the MSc Degree, during the period 2000-2005.

1989: High school degree (Liceo Scientifico) achieved at the Liceo Scientifico "E. Mattei", Castrovillari (CS) (Italy). Grade: 54/60.

Publications

13) R. Schifano, A. Vinattieri, M. Bruzzi, **S. Miglio**, S. Lagomarsino, S. Sciortino, F. Nava, "Electrical and optical characterization of 4H-SiC diodes for particle detection", accepted for publication on *J. Appl. Phys.*

12) **S. Miglio**, M. Bruzzi, M. Scaringella, D. Menichelli, A. Baldi, G. Bongiorno, P. Piseri and P. Milani, "Development of humidity sensors based on nanostructured carbon films", accepted for publication on *Sensors Actuators B*.

11) **S. Miglio** with M. Bruzzi et al., Radiation tolerant materials for semiconductor detectors at SuperLHC, accepted for publication on *Nucl. Instrum. & Meth. A*.

10) D. Menichelli, M. Scaringella, **S. Miglio**, M. Bruzzi, Z. Li, E. Fretwurst, I. Pintilie, "Influence of deep levels on space charge density at different temperatures in γ irradiated silicon", *Nucl. Instr. And Meth. A*, **530**, (2004), 139.

9) M. Bruzzi, **S. Miglio**, M. Scaringella, G. Bongiorno, P. Piseri, A. Podesta' and P. Milani, "First study of humidity sensors based on nanostructured carbon films produced by supersonic cluster beam deposition", *Sens. Actuators B*, **100**, (2004), 173.

8) M. Bruzzi, F. Hartjes, S. Lagomarsino, D. Menichelli, **S. Miglio**, M. Scaringella, S. Sciortino, "Defect analysis of diamond particle detectors by means of photoconductivity and thermal spectroscopy characterization", *Phys. Stat. Sol. (a)*, **199**, (2003), 138.

7) M. Bruzzi, P. Piseri, **S. Miglio**, G. Bongiorno, E. Barborini, C. Ducati, J. Robertson and P. Milani, "Electrical conduction in nanostructured carbon and carbon metal films grown by supersonic cluster beam deposition", *Europ. Phys. J.*, **36**, (2003) 3.

6) S. Pini, M. Bruzzi, M. Bucciolini, E. Borchini, S. Lagomarsino, D. Menichelli, **S. Miglio**, M. Scaringella, S. Sciortino, "High-bandgap

semiconductor dosimeters for radiotherapy applications”, *Nucl. Instr. Meth. A*, **514**, (2003), 135.

5) M. Bruzzi, M. Bucciolini, S. Lagomarsino, D. Menichelli, **S. Miglio**, S. Pini, M. Scaringella, S. Sciortino, "Deep Levels in CVD Diamond and Their Influence on the Electronic Properties of Diamond-Based Radiation Sensors", *Phys. Stat. Sol. (a)*, **193**, (2002) pp. 563-571.

4) M. Bruzzi, **S. Miglio**, P. Piseri, G. Bongiorno. I.N. Kholmanov, P. Milani, "Electrical Transport Properties of Nano-Structured Metal-Carbon Films", *Mat. Res. Soc. Symp. Proc.*, **704**, (2001) 313.

3) M. Bruzzi, **S. Miglio**, S. Pirollo, S. Sciortino, "Electrical Properties and defect analysis of neutron irradiated undoped CVD diamond films", *Diam. Relat. Mater.*, **10**, (2001), 601.

2) F. Bogani, **S. Miglio**, S. Sciortino, A. Taschin, A. Vinattieri, "Free exciton photoluminescence as a probe of CVD diamond", *Phys. Stat. Sol. (a)*, **181**, (2000), 23 .

1) E. Borchini, M. Bruzzi, L. Lombardi, D. Menichelli, **S. Miglio**, S. Pirollo, S. Sciortino, D. Serafini, "Photo-induced current spectroscopy in undoped diamond films", *Mat. Res. Soc. Symp. Proc.*, **588**, (2000), 277 .

Conferences attended

- ◆ M. Bruzzi, **S. Miglio**, E. Barborini, P. Milani, P. Piseri, "Electrical conduction of nanostructured carbon films grown in the presence of metallorganic precursors", Diamond 2001, Budapest, 2 -7 September, 2001.
- ◆ E. Barborini, G. Bongiorno, M. Bruzzi, M. Longo, **S. Miglio**, P. Piseri and P. Milani, "Electrical transport properties of nanostructured carbon films produced by Supersonic Cluster Beam Deposition", E-MRS Spring Meeting, Strasbourg, 18 - 21 June, 2002, Symposium S.
- ◆ M. Bruzzi, **S. Miglio**, M. Scaringella, G. Bongiorno, P. Piseri, A. Podestà and P. Milani, "Initial studies on humidity sensors based on nanostructured carbon films produced by Supersonic Cluster Beam Deposition", E-MRS Spring Meeting, Strasbourg, 10-13 June, 2003.
- ◆ **S. Miglio**, M. Bruzzi, S. Lagomarsino, F. Nava, R. Schifano, S. Sciortino, A. Vinattieri, "Electrical and optical characterization of 4H-SiC detectors", ICSCRM 2003 4-10 October, 2003 Lyon (France).
- ◆ **S. Miglio**, M. Bruzzi, M. Scaringella, D. Menichelli, A. Baldi. G. Bongiorno, P. Piseri and P. Milani, "Development of humidity sensors based on nanostructured carbon films", Eurosensors 2004, Rome, 13-15 September 2004.
- ◆ **S. Miglio**, M. Bruzzi, M. Scaringella, D. Menichelli, A. Baldi. G. Bongiorno, P. Piseri and P. Milani, "Humidity sensing characterization of nanostructured carbon films", AISEM 2005, Firenze, 15-17 Febbraio 2005.

Courses and seminars attended

- ◆ X National School on Material Science, INFM, Sept. 27 – Oct. 8, 2004, Sestri Levante (GE) .
- ◆ V Euroensors School, University of Roma Tor Vergata, Rome, Sept. 11-12, 2004
- ◆ Electrical measurement for nanotechnology, CNR Bologna (Italy), Sept. 16, 2003.
- ◆ National school on vacuum technology, University of Trento e INFM (National Institute of Physics of Matter), Trento (Italy), Dec. 9–14, 2002.

Foreign languages

Very good knowledge of written and spoken English. Scholastic knowledge of French.

Computer skills

Full knowledge of the WINDOWS operating systems and of several widespread software packages (i.e. Microsoft Office, Latex, Matlab, Origin, Photo paint, Corel draw, network browsers, e-mail clients).

Hobbies

Reading, mainly classical and contemporary literature, listening to music, playing piano, dancing Flamenco. Enjoying almost every kind of sport, particularly fond of swimming.

Personal information

Civil status: Single

Date of birth: 24/01/1971

Place of birth: Castrovillari (CS) (Italy)

Citizenship: Italian

Permanent address: Via T. Campanella, 13 87012 – Castrovillari (CS) (Italy)

Present address: Via B. Franceschini, 5 50142 Firenze (Italy)