

# Simone Quaranta

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## Curriculum Vitae

### Education

- 2012–2017 **Ph.D. in Materials Science**, *University of Ontario Institute of Technology (UOIT)*,  
(April) Oshawa, Canada, ,,  
"Nanostructured materials for Photovoltaics and Microwaves Electronics: Methods and Applications"
- 2008–2011 **Master in Chemistry**, *University of Rome "La Sapienza"*, Rome, Italy, GPA –  
110/110 *cum laude*.  
Specialized in Materials
- 2002–2008 **Bachelor in Chemistry**, *University of Rome "La Sapienza"*, Rome, Italy, GPA –  
110/110.  
Specialized in Materials

### Ph.D. thesis

- Title *Nanostructured materials for Photovoltaics and Microwaves Electronics: Methods and Applications*
- Supervisor Prof. Franco Gaspari
- Description Thesis's investigation focuses on three areas of broad and current interest for high-tech applications:
1. Photovoltaics: photoanodes for Dye Sensitized Solar Cells (DSSCs).
  2. Solid state devices for colorimetric iron sensing.
  3. Radio frequency and microwave engineering: Microstrip Patch Antennas for printed electronics.

### Master

- Title *Preparation and characterization of Carbon Nanotubes Titanium Dioxide composites for Dye Sensitized Solar Cells applications*
- Supervisors Dr. Alessandro Latini
- Description The thesis has focused on synthesis (i.e. Sol-Gel, Hydrothermal, Anodization) and characterization (morphological, structural, optical and electrical) of Multiwalled Carbon Nanotubes (MWCNTs)-Anatase Schottky junctions. TiO<sub>2</sub>-MWCNTs composites have been used as photoanode materials for Dye Sensitized Solar Cells (DSSCs).

### Bachelor

Title *Synthesis and dielectric characterization of Rare Earths Oxides thin films*  
Supervisors Prof. Daniele Gozzi  
Description Dielectric properties (dielectric constant, loss tangent, dielectric strength) of *high-κ* rare earth oxides ( $\text{Er}_2\text{O}_3$ ,  $\text{Y}_2\text{O}_3$ ,  $\text{Tm}_2\text{O}_3$ ) deposited by Electron Beam Physical Vapor Deposition (EB-PVD). Electrical behavior has been related to structural and morphological materials properties

## Scientific publications

- S. Quaranta, A. Latini, M. Tucci, and D. Gozzi. "Efficiency improvement and full characterization of dye-sensitized solar cells with MWCNT/anatase Schottky Junctions ". *Journal of Power Sources*, 204:249-256, 2012.  
**S.Q. contribution:** responsible for synthesis and characterization of Carbon nanotubes , Schottky diodes fabrication, DSSCs assembly and devices characterization (with A.L).
- A. Latini,R. Panetta, C. Cavallo, D. Gozzi, S. Quaranta "A Comparison of the Performances of Different Mesoporous Titanias in Dye-Sensitized Solar Cells ". *Journal of Nanomaterials* Volume 2015, Article ID 450405.  
**S.Q. contribution:** responsible for synthesis and characterization of different morphology materials (with C.C. and R.P), DSSCs assembly and devices characterization.
- C. Cavallo, A.Salleo, D. Gozzi, F. Di Pascasio, S. Quaranta, R. Panetta, A. Latini "Solid Solution of Rare Earth Cations in mesoporous Anatase beads and their performances in Dye Sensitized Solar Cells" *Scientific Reports* 5:16785 (2015)  
**S.Q. contribution:** responsible for synthesis and characterization of lanthanides doped anatase, DSSCs assembly and devices characterization (with C.C. and R.P).
- N. O. Laschuk, I. I. Ebralidze, S. Quaranta, S. Kerr, J. G. Egan, S. Quaranta, F. Gaspari, A. Latini, O. V. Zenkina "Rational design of a material for rapid colorimetric  $\text{Fe}^{2+}$  detection". *Materials and Design* 107: 18-25 (2015).  
**S.Q. contribution:** responsible for titania synthesis and films deposition, colorimetric sensors production and characterization (with J.G.E. and O.V.Z.).
- V.L. Davis, S. Quaranta, C. Cavallo, A. Latini, F. Gaspari "Effect of single-chirality single-walled carbon nanotubes in dye sensitized solar cells photoanodes" *Solar Energy Materials and Solar Cells* 167:162-172.  
**S.Q. contribution:** responsible for SWCNTs chirality separation and characterization (with V.L.D.), DSSCs assembly and devices characterization (with C.C. and A.L.).
- C. Cavallo, V. Mantella, A. Dulong, S. Quaranta "Investigation on Zr, Hf, and Ta doped submicrometric DSSCs photoanodes" *Journal of Applied Physics A* 123:180-188 (2017).  
**S.Q. contribution:**responsible for DSSCs assembly and devices characterization (with C.C.), data analysis, group coordination.
- "Monolayer Electrochromic Materials" J .T. A Allan, S. Quaranta, I. I. Ebralidze, J. G. Egan, B. Easton, F. Gaspari, O. V. Zenkina Just accepted ( DOI: 10.1021/acsami.7b11848 ) *ACS Appl. Mater. Interfaces*, 2017, 9 (46), pp 40438-40445.  
**S.Q. contribution:** responsible for bare and ligand-functionalized materials characterization, ITO films deposition, electrochromic devices assembly and spectro-electrochemical characterization (with J.T.A).
- A. Khan, P.Savi, S.Quaranta, M. Rovere, M. Giorcelli, M. Giorcelli, A. Tagliaferro, C. Rosso, C. Q. Jia "Low-Cost Carbon Fillers to Improve Mechanical Properties and Conductivity of Epoxy

Composites" *Polymer* 2017, 9, 642.

**S.Q. contribution:** responsible for bare materials thermal, surface area and porosity characterization.

- P.Savi, K. Naishadam, A. Bayat, M. Giorcelli, S. Quaranta "Multi-Walled Carbon Nanotube Thin Film Loading for Tuning Microstrip Patch Antennas" *10<sup>th</sup> European Conference Antennas and Propagation Proceedings*, Davos (2016)

**S.Q. contribution:** responsible carbon materials characterization (with M.G.), films deposition, antenna fabrication and characterization (with P.S.).

- S.Quaranta, P. Savi, E, M. Giorcelli, A. A. Khan, A. Tagliaferro, C. Q. Jia "Biochar-Polymer composites and thin films: characterization and applications" *IEEE 2nd International Forum on Research and Technologies for Society and Industry Leveraging a better tomorrow Proceedings*, Bologna (2016)

**S.Q. contribution:** I was responsible carbon materials characterization (with M.G.), films deposition, antenna fabrication and characterization (with P.S.).

- P. Savi, K. Naishadham, S. Quaranta, M. Giorcelli, A. Bayat, Chiara Ramella "Design of a Graphene-Loaded Slotted Ring Resonator for Sensor Applications" *11<sup>th</sup> European Conference Antennas and Propagation Proceedings*, Paris (2017)

**S.Q. contribution:** responsible carbon materials characterization (with M.G.), films deposition, antenna fabrication and characterization (with P.S.).

- P. Savi, K. Naishadham, S. Quaranta, M. Giorcelli, A. Bayat "Microwave Characterization of Graphene Films for Sensor Applications" *IEEE I2MTC 2017 Proceedings*, Turin (2017), (Accepted)

**S.Q. contribution:** responsible carbon materials characterization (with M.G.), films deposition, antenna fabrication and characterization (with P.S.).

## Experience

### Vocational

Currently **Post-doctoral researcher**, NANOSTRUCTURES LAB, DEPARTMENT OF ELECTRONIC, INFORMATION, AND TELECOMMUNICATIONS ENGINEERING LA SAPIENZA UNIVERSITY, Rome, Italy.

Electroplating of metallic and transparent conductors for silicon solar cells and printed circuit boards.

Feb. **Quality Control Technician internship**, SILFAB SOLAR, Toronto, ON Canada.

2015-July Quality assurance on photovoltaics raw materials (EVA, PVDF, Solar cells, Aluminum, antireflective coatings etc.) and assembled panels. Materials and assembly optimization for PID (Potential Induced Degradation) and LID (Light Induced Degradation) free Silicon solar panels.

May **Teaching Assistant**, UOIT, Oshawa ON, Canada.

2012-May TA for Physics I, Physics II, Physics II Lab, Physics for Biosciences Lab, Physics for Health Sciences.

February **Research assistant**, UOIT, Oshawa ON, Canada.

2012-2015 Electrochemical synthesis and characterization of copper based materials for water splitting and its integration into the Copper-Chlorine cycle for Hydrogen production.

February **Research assistant**, EUROPEAN COMMUNITY, synthesis and characterization of Bismuth based materials for organic dyes photodegradation applications, affiliated to European Community PhocsClean Project, EU Contract 318987 <http://areeweb.polito.it/ricerca/phocsclean/>.

## Scientific Skills

Photovoltaics, third generation photovoltaic devices. Thick film technology (PTF and fritless pastes) for photovoltaics and printed electronics Expert of thin films and nanostructured materials synthesis and characterization (chemical, electrochemical, morphological, structural, optical, electrical, thermal).

## Computer skills

Basic Eagle PCB software, P-Spice, Visual Basic  
Intermediate OpenOffice, Microsoft Windows, Microsoft Office  
Advanced L<sup>A</sup>T<sub>E</sub>X, Labview, OriginLab

## Communication Skills

- 2013 Oral Presentation at the 2013 CTAS (Canadian Thermal Analysis Society, Oshawa ON, Canada)
- 2014 Oral Presentation at New Generation Solar Photovoltaics Canada, Toronto ON, Canada

## Languages

English	Advanced	<i>Fluent</i>
Italian	Mother tongue	
French	Basic	<i>Basic words and phrases only</i>
Portuguese	Basic	<i>Basic words and phrases only</i>

## Interests

- Electronics
- Reading
- Cooking
- Stand-up comedy
- Soccer