

# Diego Colombara

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## Personal Information:

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Date of birth: 23/06/1984

Nationality: Italian

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## Professional experience:

**University of Genova** (Italy) – 30<sup>th</sup> December 2018 – present

**Associate Professor (since 2022) c/o Department of Chemistry and Industrial Chemistry**

Coordinator of European Innovation Council project REMAP. Reusable mask patterning (budget ca. 3.9 M€).

Curiosity-driven UniGe funded project EDICT. Effective doping of Chalcopyrite (budget ca. 50 k€).

Supervision: two Marie Curie Fellows ([Shiva Navazani](#) & [Fatemeh Shahbazi](#)), two postdocs (Christian Rossi & Marco Piccinni), Co-supervision: three PhD candidates (Michael Casale, Jean Pierre Miranda and Zheming Liu). Supervision of one MSc and two BSc students. Teaching: *General and Inorganic Chemistry* and *Scientific Writing* (tot. 9.5 ECTS).

**International Iberian Nanotechnology Laboratory** (Portugal) – 1<sup>st</sup> November 2017 – 29<sup>th</sup> December 2018

**Marie Curie Fellow c/o Quantum Materials Science and Technology Department**

H2020 NanoTrain for growth project (lab. budget: 18 k€).

My research at INL was devoted to the development of template-free micropattern electrodeposition with exploratory applications in photovoltaics (Nanostructured Solar Cells Laboratory, led by Dr. Sascha Sadewasser) and water splitting (Nano Materials for Energy Laboratory, led by Dr. Lifeng Liu). It led to [one patent application](#).

**Université du Luxembourg** (Luxembourg) – 1<sup>st</sup> June 2012 – 31<sup>st</sup> October 2017

**Core Junior Fellow c/o Laboratory for Energy Materials**

FNR-funded project GALDOCHS. Gas-phase alkali doping of chalcogenide semiconductors (budget: ca. 450 k€).

As the principal investigator in this project, I studied a novel gas-phase strategy for the doping of Cu(In,Ga)Se<sub>2</sub> solar cell absorbers with sodium and potassium. Partners involved: LIST (Luxembourg Institute of Science and Technology), University of Surrey (UK), Université de Versailles (France), La Sapienza University of Rome (Italy) and EMPA (Swiss federal laboratories for materials science and technology).

- Planning and leading the project; coordinating partners' contributions and project meetings; dissemination.
- Teaching one bachelor course; scientific mentoring of PhD students/colleagues; doctorate evaluation committee.
- Overseeing chemical safety and chemical waste disposal for the Electrochemistry laboratory; administration.

FP7 European project Scalenano. Development and up-scaling of innovative photovoltaic cells, processes and architectures to pilot-line scale for industrial application.

My contribution to this project is related to the studies of electrodeposition and conversion of Cu-Sn-Zn metal films to *Kesterite* Cu<sub>2</sub>ZnSnSe<sub>4</sub> absorber layers for thin film solar cells based on Earth-abundant materials, as well as to the development of an on-line testing tool for photoelectrochemical assessment of the absorber's optoelectronic properties within the framework of an industrial collaboration.

- Designing/assembling new custom-made apparatuses, involving the coordination of several international suppliers (ThermCraft, AnnealSys, Hositrad, Vacom, Carbolite).
- Coordinating scientific collaborations/reporting with project partners in the framework of two work packages.
- Disseminating 19 scientific outcomes of two WPs through peer-reviewed and conference contributions.
- Supervision of one MSc student (Erika Robert) and one PhD candidate (Alexandre Crossay). Teaching of one bachelor course (Inorganic Chemistry).

**Fabbricazioni Nucleari S.p.a.**, Alessandria (Italy) – 15<sup>th</sup> May 2006 – 15<sup>th</sup> March 2008

**Part-time researcher**

I designed a demonstration pilot plant to produce  $\gamma$ LiAlO<sub>2</sub> for molten carbonate fuel cells out of a formulation that I had devised during my previous Bachelor internship spent at the company.

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## Education:

**University of Bath** (United Kingdom) – 1<sup>st</sup> November 2008 – 31<sup>st</sup> May 2012

### PhD in Physical Chemistry

Supervisors: Prof. Laurence M. Peter and Prof. Frank Marken  
EPSRC project “SuperGen” Photovoltaic materials for the 21<sup>st</sup> Century.

[Investigation of Chalcogenide Absorber Materials for Photovoltaic Applications](#)

During my PhD project I electroplated thin films of the Cu-Sb-S and Cu-Bi-S systems and I investigated semiconductor alternatives to Cu(In,Ga)Se<sub>2</sub> for photovoltaic applications. The thesis focused on the implications of thermodynamics and kinetics of thin film formation on phase segregation and morphological properties of the resulting chalcogenide films. I also synthesized single crystals of Cu<sub>2</sub>ZnSnS<sub>4</sub> via chemical vapour transport for fundamental structural studies.

**Università degli Studi di Genova & Cranfield University** (Italy, UK) – 18<sup>th</sup> Sept. 2006 – 15<sup>th</sup> October 2008

**Laurea Specialistica in Scienze Chimiche (Classe 62/S), votazione di 110/110**  
(Corresponding to 2 year taught master in Chemistry, 110/110)

Supervisors: Prof. K. Rogers (Cranfield University, UK) and Prof. G. Borzone (Università di Genova, IT)  
Dissertation project: *Mo/CuInS<sub>2</sub>/CdS/TCO thin film photovoltaic systems*.

**Università degli Studi di Genova** (Italy) – 22<sup>nd</sup> September 2003 – 18<sup>th</sup> September 2006

**Laurea Triennale in Chimica (Classe 21), votazione di 110/110 e lode**  
(Corresponding to BSc in Chemistry, 110/110 cum laude)

Supervisor: Prof. A. Saccone  
Dissertation project: *Synthesis of  $\gamma$ -LiAlO<sub>2</sub> for matrixes of molten carbonate fuel cells*.

**Istituto Tecnico Industriale Statale “A.Gastaldi-G.Giorgi” di Genova** (Italy) – 1998-2003

**Maturità Tecnica Industriale con specializzazione in Chimica, votazione di 100/100**  
(Industrial Technical specialization in Chemistry 100/100)

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## I.P. related training:

Oct 2016 – **Dessins et modèles & droits d'auteur** – Institut de la Propriété Intellectuelle Luxembourg (IPIL); **La marque comme élément de différenciation commerciale** (IPIL); **IP, R&D and knowledge transfer** (Sigmar Lampe, Uni Luxembourg). Jul 2016 – **General course on intellectual property** (World Intellectual Property Organization).

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## Language skills:

**Italian:** native; **English:** full proficiency; **French:** intermediary knowledge – certified B1-3 level; **German:** elementary knowledge – certified A2-1 level; **Turkish:** elementary knowledge.

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## Project Grants (total > 5.0 M€), Bursaries, Awards, Distinctions:

2024 – **Raffaello Nasini Prize** by Inorganic Chemistry division of Società Chimica Italiana.  
2023 – **Full Prof. Habilitation** by Italian Min. of Education: *Fondamenti delle Scienze Chimiche e Sistemi Inorganici*  
2023 – **PI of bilateral IT-US project e-APP** (1 of 18 selected by the Italian Ministry of Foreign Affairs) > **190 k€**  
2023 – **PI of PRIN 2022 project LEGACY** > **180 k€**  
2023 – **Supervisor of Marie Curie project FOTOCER** > **170 k€**  
2022 – **Supervisor of Marie Curie project SHERPA** > **180 k€**  
2021 – **Coordinator of REMAP project**, European Innovation Council, Pathfinder Open > **3.9 M€**  
2020 – **PI of EDICT and European Research Incentive projects**, University of Genova. > **110 k€**  
2019 – **Back cover highlight** for *physica status solidi (RRL) – Rapid Research Letters* 13, 1900145 (2019).  
2015 – **Back cover highlight** for *physica status solidi (a)* 212, 88–102 (2015).  
2014 – **Best poster prize** to PhD A. Crossay at 6<sup>th</sup> World Conference on PV Energy Conversion (Kyoto, Japan).  
2014 – **Core Junior fellowship grant**, Fonds National de la Recherche Luxembourg. > **450 k€**  
2009 – **First poster prize at the Sustainability Exchange Conference**, University of Exeter.  
2009 – **Gold medal “Gianni Stagno”** as best Master Thesis of University of Genova 2007/2008. Rotary Club.  
2004 – **Marino Novi Studentship** for Chemistry Bachelor studies. Società Chimica Italiana.  
2003 – **Silver medal** at Olympics of Chemistry for “Industrial Technical Students” of Liguria, Società Chimica Italiana.

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## Other Scholarly, Academic and Teaching Responsibilities:

- Co-organiser of the *Production and Reliability of CIGS solar cells* symposium at the 49<sup>th</sup> IEEE Photovoltaics Specialists Conference, Philadelphia/ USA (2022). Member of the organizing committee of the 51<sup>st</sup> International Conference *Journées des Actinides*, Santa Margherita/ Italy (2022). Conference chair for the *Electro-optical Characterization* session at the 7<sup>th</sup> World Conference on Photovoltaic Energy Conversion, Waikoloa/ USA (2018).
- Proposal reviewer for Italian Ministry of University and Research and for Israel Science Foundation. Regular reviewer for Wiley, Elsevier, Springer-Nature, American Chemical Society and RSC journals (ca. 150 reviews).
- Lecturer of *Chimica Generale e Inorganica* (CHIM/03) for *Laurea Triennale in Chimica e Tecnologie Chimiche* at the University of Genova (5 ECTS, since 2019). Lecturer of *Chimica Generale e Inorganica e Laboratorio* (CHIM/03) for *Laurea Triennale in Scienze Biologiche* at the University of Genova (3.5 ECTS, since 2020). Lecturer of *Scientific Writing* for Erasmus Mundus SERP+ Master programme in *Scienza e Ingegneria dei Materiali* at the University of Genova (1 ECTS, since 2021). Lecturer of *Chimie Inorganique* for BSc degree in Physics at the University of Luxembourg (from 2013 to 2016). Examination assistant of *Chimie Organique* for BSc degree in Physics (2013-2016). Lecture series delivered to Postgraduate School on Material Science at the University of Genova (2013). Demonstrator of *Physical Chemistry Laboratory* to MSc students (2009) and at the international *Electrochemistry Winter School* (2009-2010) at University of Bath, UK.
- President of the 2020 *Nanochemistry* PhD evaluation committee at the University of Genova (7 examinations). Member of the Faculty Board of the Doctoral School in *Chemical and Materials Science and Technology* of Genova (33 evaluations since 2020). Vice-chairman and member of the PhD evaluation committees at the University of Luxembourg (3 examinations), Parma (2 examinations), and Notre Dame (1 examination).

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## Affiliations and Other Experiences:

- Associate Member of the Royal Society of Chemistry (RSC) since January 2010
- Member of Società Chimica Italiana (SCI) since January 2018. Regional Board member since January 2023
- Responsible in charge of chemical safety and toxic chemical waste disposal (May 2013 – October 2017)
- Lab custodian of a Research Physical Chemistry. Lab. involving handling of glove boxes since January 2010
- Knowledge of main Microsoft Office package and Origin, ongoing training for Comsol Multiphysics

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## Selected Conferences, Workshops and Schools attended:

Dec 2023 – Christmas lecture at *École Normale Supérieure de Chimie* – Paris (Single-authored, Oral)  
June 2022 – 49<sup>th</sup> IEEE Photovoltaic Specialist Conference – Philadelphia (Single-authored, Oral)  
Sept 2021 – 27<sup>th</sup> National Congress of the Italian Chemical Society – Online event (Co-authored, Oral)  
Feb 2020 – SuperFOx (superconductivity and functional oxides) – Santa Margherita, Italy (Oral)  
Sept 2019 – 47<sup>th</sup> Inorganic Chemistry Congress of Italian Chemical Society – Bari, Italy ([Invited Talk](#))  
June 2019 – 46<sup>th</sup> IEEE Photovoltaic Specialist Conference – Chicago, USA (Poster)  
June 2018 – 7<sup>th</sup> World Conference on Photovoltaic Energy Conversion – Waikoloa, USA (Poster)  
May 2017 – 231<sup>st</sup> Electrochemical Society Meeting – New Orleans, USA ([Invited Talk](#))  
Apr 2017 – Materials Research Society Meeting – Phoenix, USA (Poster)  
Aug 2016 – SPIE Optics and Photonics for Sustainable Energy – San Diego, USA (Oral)  
Nov 2015 – ManuFuture-EU Conference – Luxembourg, (Attendante)  
May 2015 – 227<sup>th</sup> Electrochemical Society Meeting – Chicago, USA (Oral)  
Nov 2014 – Collaborative Conference on Crystal Growth – Phuket, Thailand ([Invited Talk](#))  
Sept 2014 – EU PVSEC Specialist conference – Amsterdam, Netherlands (Poster)  
Oct 2013 – 224<sup>th</sup> Electrochemical Society Meeting – San Francisco, USA (Poster)  
Aug 2013 – Solar Energy for World Peace Conference – Istanbul, Turkey (Oral)  
July 2011 – X-ray and neutron scattering Summer School – INEL Caen, France  
May 2011 – E-MRS/MRS Bilateral Conference on Energy- Nice, France (Poster)  
Nov 2010 – 1<sup>st</sup> Kesterite Workshop – Ångström lab, Uppsala Universitet, Sweden (Oral)  
June 2010 – E-MRS Conference – Strasbourg, France (Poster)  
Sept 2009 – Quantsol International Summer School – Hirshegg, Austria  
Nov 2007 – Hydrogen and Fuel Cells Workshop – ENEA Casaccia research centre, Rome, Italy (Oral)

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## Publications

43, of which 23 as first, last or corresponding author. H index (citations) – Scopus: 18 (1512); Google Scholar: 21 (1945). Overall, my disseminations comprise 32 corresponding-author presentations (of which 5 invited talks) at conferences such as ECS, E-MRS/MRS, SPIE, EU-PVSEC/IEEE-PVSC/WCPEC, and 11 invited seminars.