

SIMONE CASADIO

Researcher in Material Science | Energy and Electrochemistry

**Education**1/10/2020 –
25/03/2024

PhD in Molecular Sciences – 36th cycle – cum Laude
Università degli Studi di Padova (Italy)
Curriculum: Chemical Sciences

- Research Institute: ISSMC-CNR, Faenza (RA)
- Research Topic: Development of thin-film photoelectrodes with compact structures (sol-gel/spin-coating) and/or nanostructures (*in-situ* solvothermal synthesis/deposition) based on multifunctional perovskite materials with piezo-phototronic properties ($\text{Bi}_4\text{Ti}_3\text{O}_{12}$ and Bi_2MoO_6), aimed at enhancing charge separation and transport kinetics in the photoelectrochemical reduction of CO_2 (PEC- CO_2RR). The underlying mechanism exploited is the polarization-induced modulation of band bending in ferroelectric materials. Additional strategies were investigated, such as doping (Fe-, Co-, La-doped $\text{Bi}_4\text{Ti}_3\text{O}_{12}$) and the use of co-catalysts (synthesis of Cu_2O nanocubes), to improve the photocatalytic activity of the developed systems in the target reaction. The PhD project encompassed both the synthesis of all developed systems and their structural (XRD), morphological (FE-SEM), optical (UV-Vis), photoelectrochemical (LSV, Mott-Schottky, EIS), and functional (PEC- CO_2RR) characterization, including determination of reaction products.
- Thesis Title: Development of Aurivillius-based photoelectrodes for the photoelectrochemical CO_2 reduction (dissertation: 25/03/2024)
- Supervisor: Dr.ssa A. Sanson

2016-2019

Master of Science (MSc) in Industrial Chemistry (LM-71) – 110 out of 110
School of Science- Alma Mater Studiorum Università di Bologna (Italy)

Tirocinio di Ricerca atto alla preparazione della Tesi – 1250 ore

- Research Institute: Istec-CNR, Faenza (RA)
- Research Field: Inorganic and Material Chemistry
- Research Topic: Development and optimization of Grätzel Solar Cells (third-generation solar cells) in a “fiber-shaped” configuration based on TiO_2 and organic dyes
- Thesis Title: Development and Optimization of Fibre-Shaped Dye-Sensitized Solar Cells employing an innovative Fully Organic Sensitizer
- Research Group: Materials and Processing for Energetics
- Supervisors: Dr. Alessandra Sanson (*Istec-CNR*), Dr. Nicola Sangiorgi (*Istec-CNR*), Prof.ssa Cristina Femoni (*Università di Bologna*)

2012-2016

Bachelor of Science (BSc) in Chemistry and Technologies for the Environments and Materials (L-27) – 110 out of 110, *cum Laude*
School of Science- Alma Mater Studiorum Università di Bologna (Italy)
Curriculum: Traditional and Innovative Materials

Research Internship for BSc thesis preparation – 200 hours

- Company: Unigrà S.r.l., Conselice, Italy
- Research Field: Chimica Organica
- Thesis Title: Effect of Chemical Interesterification on the Physicochemical Properties of Binary Blends of Vegetable Fats (Language: Italian)
- Research Topic: Investigation of the new physicochemical properties resulting from the chemical interesterification process applied to vegetable fat mixtures for food applications
- Supervisors: Dr. Massimo Fusari (*Unigrà S.r.l.*), Dr.ssa Lucia Gramigna (*Unigrà S.r.l.*), Prof. Daniele Nanni (*Università di Bologna*)

International Mobility Experience

June – July 2024

University of Malaya (UM) – visiting researcher (HORIZON – MSCA program)
Department of Mechanical Engineering, Kuala Lumpur (Malaysia)

- Research Topic: Development of Porous nanocomposites AC/TiO₂, AC/SiO₂, AC/TiO₂/SiO₂ (AC: Activated Carbon) *via* ice-templating for applications in heat exchangers and photocatalysis
- Hosting Professor: Prof. Kazi. MD Salim Newaz

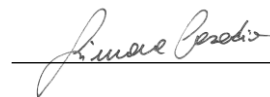
March – July 2018

University College London (UCL) – (*Erasmus + program*) – during MSC
Department of Chemistry, London (United Kingdom)

- Research Topic: Development of highly porous copper-based structures for use as current collectors or electrodes in supercapacitors and lithium-ion batteries, starting from freeze-casting of copper oxide nanoparticles produced *via* Continuous Hydrothermal Flow Synthesis, followed by reduction.
- Research Group: Clean Materials Technology Group
- Supervisor: Prof. Jawwad A. Darr

April – July 2016

Manchester Metropolitan University (MMU) – Postgraduate Research Internship (Erasmus+ Internship Program)
Faculty of Science and Engineering, School of Science and the Environment, Division of Chemistry and Environmental Science, Manchester (United Kingdom)



- Research Topic: Development of biosensors for neurotransmitter detection using the Heat Transfer Method (HTM), based on flexible polymer-matrix electrodes fabricated via screen-printing from specially synthesized Molecularly Imprinted Polymer (MIP) powders.
- Supervisor: Dr. Marloes Peeters

Professional Experience

**16/12/2024 –
Present**

ISSMC-CNR – Level III Researcher – Fixed-Term Contract

Research Topic: Development and characterization of photoelectrodes based on Aurivillius-structured piezo-phototronic materials for the photoelectrochemical CO₂ reduction reaction (PEC-CO₂RR) (WP2.1 - LA2.1.12: Liquid hydrogen carriers produced via photochemical and photoelectrochemical conversion of CO₂ and water).

Project: H2 - AdC ENEA/CNR POR IDROGENO, LA 1.1.34 - LA2.1.12 - LA2.3.2 (CUP: B93C22000630006)

Research Group: Materials and Processing for Energetics (Dr.ssa Alessandra Sanson)

**15/01/2024 –
16/12/2024**

ISSMC-CNR – Research Fellowship

Research Topic: Development and characterization of photoelectrodes based on LDH (Layered Double Hydroxides) with CuMgAl, CuZnAl, and CuMgFe compositions for the photoelectrochemical reduction of CO₂

Project: “CO₂ CORE AT LAST: CO₂ Conversion to Renewable fuels by dynamic Adsorption and Transformation on Layered Structured based catalysis” (PRIN 2022: Progetti di Ricerca di Rilevante Interesse Nazionale) (N. 2022MPEXJW, CUP: B53D23013840006)

Research Group: Materials and Processing for Energetics (Dr.ssa Alessandra Sanson)

**24/02/2023-
23/05/2023**

University of Bologna (UNIBo) – Teaching Tutor

Analytical Chemistry with Laboratory (Module 2) – 15 hours

BSc in Chemistry and Environmental & Materials Technologies, Faenza (RA), Supervisor: Dr. Federica Mariani

**Gennaio 2020 -
Ottobre 2020**

Istec-CNR – Research Fellowship

Research Topic: Development of BCZY-GDC-based ceramic supports with engineered porosity via freeze-casting and additive manufacturing (micro-extrusion) for asymmetric “ceramic-ceramic” membranes for hydrogen separation.

Project: “Materiali di frontiera per usi energetici”, Accordo di Programma MiSE-CNR PAR 2019-2021

Research Group: Materials and Processing for Energetics (Dr.ssa Alessandra Sanson)

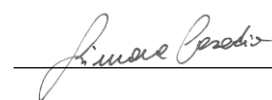
Research Topics

The research topics focus on the synthesis and development of ceramic materials and related devices for energy applications, including:

- Electrodes and photoelectrodes for photoelectrochemical cells based on chemically synthesised Aurivillius perovskite-based materials for CO₂ reduction and water-splitting CO₂ and water splitting
 - Synthesis of Aurivillius systems (Bi₄Ti₃O₁₂, Bi_{3.25}La_{0.75}Co_{0.5}Ti_{2.5}O₁₂, Bi_{3.25}La_{0.75}FeTi₂O₁₂, Bi_{3.25}La_{0.75}Co_{0.5}Fe_{0.5}Ti_{2.5}O₁₂) via sol-gel methods, fabrication of photoelectrodes, and comprehensive structural, optical, morphological, electrochemical, and photoelectrochemical characterization
 - Synthesis of nanostructured Aurivillius powders and electrodes with Bi₂MoO₆ stoichiometry via in-situ hydrothermal growth on dedicated substrates, with comprehensive structural, optical, morphological, electrochemical, and photoelectrochemical characterization
- Synthesis of Cu₂O-based cocatalysts for the CO₂ reduction reaction
- Photoanodes for third-generation “Dye-Sensitized” Solar Cells (DSSCs) based on conventional materials (e.g., TiO₂) and piezo/ferroelectric materials for PIEZO-PV applications (e.g., KNbO₃)
 - Synthesis of KNbO₃ powders via hydrothermal methods for the fabrication of photoanodes with piezo/ferroelectric properties in various morphologies (e.g., nanocubes, nanosheets, nanorods) for DSSC applications
 - Fiber-based DSSCs using TiO₂, fabricated on conventional substrates (e.g., Ti wires) and unconventional substrates (e.g., natural and synthetic fibers: cashmere, Kevlar, viscose)
- Synthesis of AC (*Activated Carbon*) nanoparticles via pyrolysis and physicochemical activation of biomass
- Synthesis of mixed-conductivity electrolytes for low-temperature solid oxide fuel cells (LT-SOFC) (LT-SOFC) (Sm_{0.2}Ce_{0.8}O_{1.9} – Na₂CO₃)
- Co-precipitation synthesis of core@shell powders Sm_{0.2}Ce_{0.8}O_{1.9}@Na₂CO₃ and their comprehensive chemical, structural, and morphological characterization
- Preparation of Electron Transport Layers (ETLs) for perovskite solar cells based on SnO₂ and ZnO, including precursor synthesis and subsequent spin-coating deposition
- Fabrication of engineered-porosity supports via freeze-casting and micro-extrusion for ceramic membranes for hydrogen separation (BaCe_{0.65}Zr_{0.20}Y_{0.15}O_{3-δ} – Gd_{0.2}Ce_{0.8}O_{2-δ}, BCZY-GDC)
 - Formulation of ceramic aqueous suspensions for the fabrication of macroporous supports with engineered porosity via freeze-casting, and their characterization
 - Formulation of polymer-based ceramic pastes for micro-extrusion of engineered-porosity honeycomb-structured supports via UV-assisted micro-extrusion

Technical Skills

- Synthesis of metal oxides compounds *via* chemical methods (sol-gel, co-precipitation, hydrothermal, molten salt synthesis) and physical methods (solid-state synthesis)
- Deposition of metal oxides films *via* screen-printing and spin-coating
- Shaping processes of ceramic powders using room-temperature technologies (uniaxial pressing and freeze-casting)
- 3D printing *via* micro-extrusion (including UV-assisted) of ceramic samples with simple and complex geometries (e.g., honeycomb)

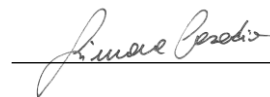


- Inkjet printing of thin layers
- Characterizations and instrumentation operated:
 - X-ray Diffraction (XRD)
 - Thermal Analysis (TGA, DSC)
 - Optical and Scanning Electron Microscopy (FE-SEM)
 - IR and UV-Vis Spectroscopy
 - Electrochemical and Photoelectrochemical Characterization (Voltammetry, Impedance, Chronoamperometry)
 - Liquid and Gas Chromatography (HPLC, GC)
 - Solar Simulator for Photoelectrochemical Analysis and Testing
 - Photocatalytic (batch) and Photoelectrocatalytic Reactors (PEC cells)

Publications (ORCID: 0000-0002-3487-4764)

1. ***S. Casadio***, A. Gondolini, E. Mercadelli, A. Sanson, Advances and prospects in manufacturing of ceramic oxygen and hydrogen separation membranes, *Renew. Sustain. Energy Rev.*, **2024**, 200, 114600.
2. S. Mantovani, A. Pintus, A. Kovtun, A. Gondolini, ***S. Casadio***, A. Sanson, T. Marforio, M. Calvaresi, M. Rancan, L. Armelao, G. Bertuzzi, M. Melucci, M. Bandini, Graphene Oxide-Arginine Composites: Efficient Dual Function Materials for integrated CO₂ capture and Conversion, *ChemSusChem*, **2024**, 17, e202301673.
3. ***S. Casadio***, M. Carmenza Diàz Lacharme, A. Donazzi, A. Gondolini, Role of carbonate amount and synthesis procedure in the conductivity of SDC-Na₂CO₃ composite electrolytes for solid oxide cells applications, *Int. J. Hydrog. Energy*, **2024**, 58, 1324-1331
4. ***S. Casadio***, A. Gondolini, N. Sangiorgi, A. Candini, A. Sanson, Highly transparent Bi₄Ti₃O₁₂ thin-film electrodes for ferroelectric-enhanced photoelectrochemical processes, *Sustain. Energy Fuels* **2023**, 7, 1107-1118.
5. A. Bartoletti, A. Sangiorgi, A. Gondolini, E. Mercadelli, ***S. Casadio***, S. Garcia-Gonzalez, M. Morales, E. Jimenez-Pique, A. Sanson, Dispersant- and solvent-free pastes for UV-assisted micro-extrusion of porous proton conductive membrane supports, *J. Eur. Ceram. Soc.* **2023**, 43, 4844-4853.
6. Gondolini, E. Mercadelli, ***S. Casadio***, A. Sanson, Freeze cast support for hydrogen separation membrane, *J. Eur. Ceram. Soc.* **2022**, 42, 1053-1060.
7. ***S. Casadio***, N. Sangiorgi, A. Sangiorgi, A. Dessì, M. Calamante, A. Mordini, A. Sanson, Highly efficient long thin-film fiber-shaped dye sensitized solar cells based on a fully organic sensitizer, *Sol. Energy Mater. Sol. Cells* **2021**, 224, 110986.
8. ***S. Casadio***, J.W. Lowdon, K. Betlem, J. T. Ueta, C.W. Foster, T.J. Cleij, B. van Grinsven, O.B. Sutcliffe, C.E. Banks, M. Peeters, Development of a Novel Flexible Polymer-Based Biosensor Platform for the Thermal Detection of Noradrenaline in Aqueous Solutions, *Chem. Eng. J.* **2017**, 315, 459-468.

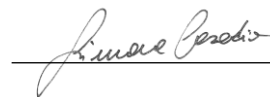
Contributi a Scuole e Convegni (*Presenting Author)



- **A. Bartoletti***, S. Casadio, R. Ceccato, E. Callone, S. Dirè, K. Monzillo, V. Vaiano, M. C. D. Lacharme, A. Donazzi, A. Gondolini, "Synthesis and development of dual-conduction electrolyte for Solid Oxide Fuel Cells", European Fuel Cell Forum 2024, Luzern (Swiss), 02 -05/07/2024 (Poster)
- **N. Sangiorgi***, S. Casadio, E. Mercadelli, A. Sanson, "Aurivillius-based photoelectrodes for solar energy conversion" Webinar on Materials Science & Nano Technology (Stripe webinar) – online, 13-14/5/2024 (*Oral communication*)
- **S. Casadio***, A. Gondolini, N. Sangiorgi, A. Candini, A. Sanson, "Piezophototronic materials for solar conversion", Molecular sciences, chemical technologies and materials for the global challenges (Giornate di dipartimento DSCTM), Sestri Levante (Italy), 18-20/10/2023 (*Oral communication*)
- **S. Casadio***, A. Gondolini, N. Sangiorgi, A. Candini, A. Sanson, "Highly transparent $\text{Bi}_4\text{Ti}_3\text{O}_{12}$ thin-film electrodes for the ferroelectric enhanced photoelectrochemical reduction of CO_2 ", ISMES-X (International School of Materials for Sustainable Development and Energy), Erica (Italy), 3-8/07/2023 (Poster)
- **S. Casadio***, A. Gondolini, N. Sangiorgi, A. Sanson, "Bismuth-based Aurivillius photo-electrodes for the ferroelectric-enhanced photoelectrochemical reduction of CO_2 " Materials for Sustainable Development Conference, MAT-SUS, NANOMAT Symposium - Advances on the Understanding and Synthesis of Nanomaterials for Photocatalysis and Optoelectronics, Barcellona (Spain), 24/10/2022-28/10/2022 (*Oral communication*)
- **S. Casadio***, A. Gondolini, N. Sangiorgi, A. Sanson, "Development of Aurivillius-based photo-electrodes for the ferroelectric-enhanced photoelectrochemical reduction of CO_2 " International Conference on Coordination Chemistry, ICC 2022, Rimini (Italy), 28/08/2022-02/09/2022, (*Oral communication*), p. 459 Book of abstract (<https://drive.google.com/file/d/1M3oDzPICsJhUTPRN-cuqhl1yjiwNJKhR6/view>)
- **S. Casadio***, A. Gondolini, N. Sangiorgi, A. Sanson, "Development of highly transparent $\text{Bi}_4\text{Ti}_3\text{O}_{12}$ thin-film electrodes for the photoelectrochemical reduction of CO_2 " International School on Inorganic Materials (InoMat-2021), December 15-18, **2021** (Poster-Flash presentation), Abstract in Book of Abstract p.22, <https://www.inomat.unito.it/>

Projects Participations

- 15/01/2024** **CO₂ CORE AT LAST Project (CO₂ Conversion to Renewable fuels by dynamic Adsorption and Transformation on Layered Structured based catalysis)** - PRIN 2022: Progetti di Ricerca di Rilevante Interesse Nazionale (N. 2022MPEXJW, CUP: B53D23013840006)
- ad oggi**
- Roles and Responsibilities: Electrochemical and photoelectrochemical characterization of LDH (Layered Double Hydroxide) layers based on CuMgAl, CuZnAl, and CuMgFe, developed for the photoelectrochemical CO₂ reduction reaction
- Institutes: ISSMC-CNR (Faenza, RA, Italy)



01/01/2024 – ad oggi **Ice-Link Project (Integration of Advanced Experiments, Computation and Data for innovation in Freeze Casting and Advanced Porous Structures)** - Call HORIZON-MSCA-2022-SE-01-01 (Prot. N. 0184503 del 16/06/2023).

Roles and Responsibilities: Synthesis of activated carbon nanoparticles via physicochemical activation of biomass for applications in heat exchangers and photocatalysis

Institute: Department of Mechanical Engineering, University of Malaya, Kuala Lumpur, Malesia (visiting researcher 03/06/2024 – 31/07/2024, Prof. Kazi. MD Salim Newaz)

01/03/2023 – ad oggi **CANVAS Project (new Concepts, mAterials and techNologies for building-integrated photoVolTAics in a diffuSed generation scenario)** – 2023–2025 Three-Year Call of the National Electric System Research Program

Roles and Responsibilities: Hydrothermal synthesis of KNbO_3 powders with varied morphologies and dimensionalities (e.g., nanorods, nanosheets, nanocubes) and their comprehensive structural, morphological, and optical characterization (WP2-LA 2.11-2.13: Development of piezo-phototronic photoanodes for DSSC applications) for the fabrication of photoanodes with piezo-phototronic properties for Dye-Sensitized Solar Cells (DSSCs).

Institute: ISSMC-CNR

03/2023 – 06/2024 **“Carbonate Ceria Composite electrolytes for novel ceramic electrolytes for low temperature application” Project** – NFFA call (Scientific Domani: Engineering and Technology, ERC Sectors: PE.05.06, PE.11.03)

Roles and Responsibilities: Synthesis of novel composite electrolytes for low-temperature SOFCs (Solid Oxide Fuel Cells) based on $\text{SDC-Na}_2\text{CO}_3$ ($\text{Sm}_{0.2}\text{Ce}_{0.8}\text{O}_{1.9}$ – Na_2CO_3) via co-precipitation, characterized using SPELEEM (Spectroscopic Photoemission and Low Energy Electron Microscope) at SOLEIL Synchrotron, France, and TEM (Transmission Electron Microscopy) at Lund University, Sweden

Institute: ISSMC-CNR

01/10/2022- ad oggi **PE-NEST Project (Network for Energy Sustainable Transition)** – PNRR Call: Creation of “Extended Partnerships with Universities, Research Centers, and Companies for the Funding of Basic Research Projects” (Mission 4, Component 2, Investment 1.3), funded by the European Union – NextGenerationEU

Roles and Responsibilities: Synthesis of piezo-phototronic systems with Aurivillius perovskite structure (e.g., Bi_2MoO_6) and antiperovskite structure ($\text{Ba}_4\text{Sb}_2\text{O}$), in both powder and film forms, for catalytic and photocatalytic applications (WP9.1: Innovative Synthesis of Materials for Energy Applications).

Institute: ISSMC-CNR

06/2022- ad oggi **PNRR POR- H_2 Project (Piano Operativo della Ricerca "Ricerca e sviluppo sull'idrogeno")** – NextGenerationEU Call – M2C2 Investment 3.5 (funded by the European Union)

Roles and Responsibilities: Fabrication of photoelectrodes based on Aurivillius-structured piezo-phototronic materials for the photoelectrochemical CO_2 reduction

reaction (PEC-CO₂RR) (WP2.1 - LA2.1.12: Liquid hydrogen carriers produced via photochemical and photoelectrochemical conversion of CO₂ and water)

- Sol-gel synthesis of Bi_{3.25}La_{0.75}Co_{0.5}Ti_{2.5}O₁₂, Bi_{3.25}La_{0.75}FeTi₂O₁₂, and Bi_{3.25}La_{0.75}Co_{0.5}Fe_{0.5}Ti_{2.5}O₁₂ powders, and their structural, morphological, optical, and functional characterization (photocatalytic degradation tests of Rhodamine B)
- Fabrication of thin-film photoelectrodes via sol-gel/spin-coating and comprehensive structural, morphological, optical, electrochemical, and photoelectrochemical characterization for PEC-CO₂RR

Institut: ISSMC-CNR

03/2022-ad oggi **Project@CNR “RIPRESA” (Integrated Piezo-Phototronic Systems for Solar CO₂ Reduction to Liquid Fuels) – progetti@CNR Call**

Roles and Responsibilities: Fabrication of photoelectrodes based on Aurivillius-structured piezo-phototronic materials for the photoelectrochemical conversion of CO₂ to liquid fuels (WP1: Design and synthesis of novel piezo-phototronic materials for the photocathode)

- Sol-gel synthesis of Bi₄Ti₃O₁₂ powders and their structural, morphological, optical, and functional characterization (photocatalytic degradation tests of Rhodamine B).
- Hydrothermal synthesis of nanostructured “flower-like” Bi₂MoO₆ powders and their comprehensive structural, morphological, optical, and functional characterization (photocatalytic degradation tests of Rhodamine B).
- Fabrication of Bi₄Ti₃O₁₂ thin-film photoelectrodes via sol-gel/spin-coating and their comprehensive structural, morphological, optical, electrochemical, and photoelectrochemical characterization.
- Synthesis of Cu₂O nanoparticles (cocatalysts for CO₂RR) and their comprehensive structural, morphological, and optical characterization.
- Fabrication of nanostructured thin-film photoelectrodes via *in-situ* hydrothermal growth of Bi₂MoO₆ on suitable substrates, with comprehensive structural, morphological, optical, electrochemical, and photoelectrochemical characterization.
- Testing of photocathodes in photoelectrochemical cells for CO₂ reduction and determination of reaction products.

Institute: ISSMC-CNR

11/2021-06/2022 **BEST-4U Project (Bifacial Efficient Solar cell Technology with 4 terminal architecture for Utility scale), - PON Research and Innovation 2014–2020 Call**

Roles and Responsibilities: Fabrication of Electron Transport Layers (ETLs) for perovskite solar cells based on SnO₂ and ZnO (Task 3.1.2: Electron Transport Layer for Perovskite Solar Cells).

- Fabrication of SnO₂ thin films via spin-coating from precursor solutions, with subsequent morphological and structural characterization
- Study of the effect of NH₄F treatments on the surface roughness properties of the layers

Institute: Istec-CNR

01/2020 - 03/2021 **SOS ACQUA Project (System for Water Decontamination and Energy Generation) - 2019 National Military Research Plan Call, Italian Ministry of Defense**

Roles and Responsibilities: Electrochemical and photoelectrochemical characterization of Cu₂O-based photocathodes for the hydrogen evolution reaction (HER) via water splitting, including photoelectrocatalytic hydrogen production tests in photoelectrochemical cells and quantification using chromatographic techniques (GC)
Institute: Istec-CNR

01/2020-10/2020 **RdS - Frontier Materials for Energy Application-** MiSE-CNR Program Agreement 2019–2021

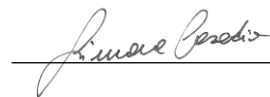
Roles and Responsibilities: Fabrication of engineered-porosity supports via freeze-casting and micro-extrusion for ceramic membranes for hydrogen separation (BaCe_{0.65}Zr_{0.20}Y_{0.15}O_{3-δ} – Gd_{0.2}Ce_{0.8}O_{2-δ}, BCZY-GDC).

- Formulation of ceramic aqueous suspensions for the fabrication of macroporous supports with engineered porosity via freeze-casting, including fabrication and structural and morphological characterization
- Formulation of polymer-based ceramic pastes for the fabrication of engineered-porosity honeycomb-structured supports via UV-assisted micro-extrusion, including fabrication and characterization

Institute: Istec-CNR

Technical Reports

- Author and Operator of Technical Report RT2022/22 “Protocol for the production and morphological and microstructural characterization of engineered-porosity supports via micro-extrusion technique”, Prot. 00011032022, 22/06/22
- Operator of the Technical Report RT2022/21 “Cer-Cer Membranes: Fabrication of Asymmetric Structures with Porous Supports via Non-Conventional Technologies”, Prot. 00011022022, 22/06/22
- Author and Operator of Technical Report RT2021/39 “Protocol for the production and morphological and microstructural characterization of engineered-porosity supports via freeze-casting,” within the MiSE-CNR Program Agreement 2019–2021 “Development and Testing of Metallic and Ceramic Membranes for Selective H₂ Separation.”, 19/07/2021
- Author and Operator of Technical Report RT2020/141 “Optimization of Electrodes for Hydrogen Production via Water Splitting” within the SOS ACQUA Project, prot. ISTEC N79, 20/01/2021
- Autore of Technical Report RT2020/87 “Systems for Water Decontamination and Energy Production; State-of-the-Art Analysis, Materials Selection, and Experimental Plan for the Development of Electrodes for Hydrogen Production via Water Splitting” within the SOS ACQUA Project, prot. ISTEC N1864, 29/09/2020
- Operator of Technical Report “Development of Electrodes for Hydrogen Production via Water Splitting” within the SOS ACQUA Project, prot. ISTEC N1859 del 28/09/2020



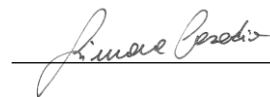
Additional Positions

- Science outreach and educational activities in collaboration with “Scuola Media Bendandi,” at the Materials and Processes for Energy Laboratory, 23–31/03/2023, Faenza, ISSMC-CNR.ISSMC-CNR.
 - Protocollo: UOR 729 PROT 0084471, 21-03-2023 (45 min)
 - Protocollo: UOR 729 PROT 0092363, 28-03-2023 (45 min)
 - Protocollo: UOR 729 PROT 0092367, 30-03-2023 (45 min)
 - Protocollo: UOR 729 PROT 0092372, 31-03-2023 (45 min)
- Science outreach activities on ceramic-material-based technologies for energy applications (DSSC solar cells and photoelectrochemical cells for water splitting and CO₂ reduction) during the ISSMC-CNR Open Day, 13/04/2023 (2 h) - Protocollo: UOR 729 PROT 0129797, 02-05-2023
- Science outreach activities on ceramic-material-based technologies for energy applications (DSSC solar cells and photoelectrochemical cells for water splitting and CO₂ reduction) during the ISSMC-CNR Open Day, 16/05/2024 (2 h) - Protocollo: UOR 729 PROT 0175754, 24-05-2024
- Science outreach activities on ceramic-material-based technologies for energy applications (DSSC solar cells and photoelectrochemical cells for water splitting and CO₂ reduction) during the European Researchers' Night 2024 at ISSMC-CNR, 27/09/2024 (2 h).- Protocollo: UOR 729 PROT 0356664, 01-10-2024

Corsi di formazione e Workshop

Education and Academic Training:

- *Solution-processed semiconductor nanostructures for thin film optoelectronics* – Enrico Della Gaspera, DiSC, Unipd, Aula I, via Marzolo, 1 – Padova 30/11/2022
- *Coffe and nanophotonics*, DiSC, Unipd, Aula A. Nasini, via Marzolo, 1 – Padova, Dr. Maria Losurdo, Dr. Maria Antonia Iatì, Prof. Pierre-Francois Brevet, Dr. Onofrio M. Maragò, Dr. Daniel Forrer, 09/09/2022
- *"Academic writing - Describing data"* – 10 h Academic English mini course for PhD Students, Unipd Language Centre, a.a. March-April – 2022
- *Electrochimica Colloquia 2022, In memory of Sergio Trasatti: "From the Volcano plot to the Electrocatalysis of small molecules."*, DiSC, Unipd, Aula A, via Marzolo, 1 – Padova, Marc Koper, Alessandro Minguzzi, Sabrina Antonello, Josè H. Zagal, Giovanni Valenti, Achille De Battisti, 25/02/2022
- *"Academic English Course for PhD Students"* – 30 h course, Unipd Language Centre, Gennaio-Febbraio 2022
- *"How to choose scientific journals? Find, evaluate, select it"*, Corso C5 Pilot training (30 hours) – Bologna Research Area Library, EU Project BRAIN@WORK, 30 hours course, 9/09/2021 – 22/10/2021
- *Potential antivirals against SARS-CoV-2*, Em. Erik De Clercq, (online course) 31/05/2021, Unipd



- *“Frontiers in Chemistry”*: Global leader for advanced algorithms for quantum simulations, IBM Research – Zurich, (online course) Ivano Tavernelli, 19/03/2021
- *Exploration of the chemical parameters space for the low temperature and sustainable hydrothermal synthesis of crystalline inorganic nanomaterials*, Silvia Gross, 22/02/2021
- *Hydrothermal reactions: from rocks and minerals formation to synthesis of particles with controlled morphology and organization*, Francesco Buscaglia, 22/02/2021
- *“Frontiers in Chemistry”*: Surfactant Micelles and Nanocrystal Growth: A Recurring Marriage, Luiz Liz-Marzan, (online course), 19/02/2021, Unipd
- *Information Literacy*:
 - Reaxys: how to retrieve literature, compound properties and chemical reaction data, Marta Da Pian, 30/11/2020
 - Open Science and institutional repositories at the University of Padova. Michela Zorzi, 18/11/2020
 - Scholarly communication and patent literature, Marina Zannoni, 18/11/2020
 - Galileo Discovery, Barbara Serino, 17/11/2020
 - Scopus, Filippo Vomiero, 17/11/2020

Safety Training

- *Training course for CNR Institute operators on Ionizing Radiation Risks* – 22/09/2024 (3h)
- *Training course for CNR Institute employees on Risks from Exposure to Chemical, Carcinogenic, Mutagenic, and Biological Agents (specific training)* – 10/07/2023 (4h)
- *Training course on Health and Safety in the Workplace for CNR Institute employees (specific training)* – 11/01/2022 (4h)
- *Training course on Health and Safety in the Workplace for CNR Institute employees: “Tools and Resources for the Management of Chemical and Carcinogenic Risks”* – 11/05/2021 (2h)

Languages

- **ITALIAN**: Native
- **ENGLISH**: C1 (CEFR – Common European Framework of Reference for Languages)

