

PERSONAL INFORMATION

Tommaso Salzillo

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Sex Male | Date of birth 26/02/1986 | Nationality Italian

CURRENT FIELDS OF INTEREST

- Application of techniques of micro-optical spectroscopy (IR, Raman and fluorescence) to molecular crystals.
- Study of photo-induced solid-state reactions in anthracene derivatives.
- Solid state phase transitions and photoreactions at high pressure and high temperature.
- Polymorphism in organic semiconductors in bulk crystal systems and thin films.
- Crystal growth of Charge Transfer crystals for organic electronics applications.
- Study of polymorphs stability and Surface mediated polymorphism APIs.
- Thin film fabrication by solution shearing and Ultra-high vacuum techniques.
- Organic field effect transistors fabrication and electrical characterization.
- Disorder-order phase transition in plastic crystals
- Structural dynamics of Perovskites and Chalcogenide Perovskites.

WORK EXPERIENCE

from 28th of November 2022 to Present

Assistant Professor Senior (RTDb), Funded by MUR – Rita Levi Montalcini

Department of Industrial Chemistry "Toso Montanari" – University of Bologna

Viale del Risorgimento, 4 - 40126 Bologna, ITALY

<https://site.unibo.it/spectroscopy-computational-chemistry/en>

"Influence of electron-phonon coupling on vibration and charge transport properties in organic semiconductors" (e-Phonon).

The research activity of the RTD is focus on the study of organic systems with semiconductor properties acquired in the context of collaborations with other research groups. In particular, pentacene and rubrene are the most studied organic semiconductors of the small molecule class and are used as reference points in OFET applications.

The research activity, in the first phase, is focused on the development of solid state spectroscopy techniques, including Far-IR and THz micro-Raman, even in conditions of high temperatures and pressures. Once the spectroscopic configurations have been developed, the experimental set-up will be set up to allow Raman and possibly IR measurements in situ and in operando. The devices in this phase are manufactured thanks to collaborations, already consolidated over time, with Italian (CNR-Bologna) and foreign (ICMAB-CSIC, Spain) research groups. In the last phase of the project, the development of the study of in situ lattice dynamics as a function of the mechanical stress applied to flexible devices is developed.

from 1st of February 2022 to 27th
of November 2022

Assistant Professor Junior (RTDa), Funded by FSE REACT EU - PON R&I 2014-2020

Department of Industrial Chemistry "Toso Montanari" – University of Bologna

Viale del Risorgimento, 4 - 40126 Bologna, ITALY

<https://site.unibo.it/spectroscopy-computational-chemistry/en>

“Spectroscopic characterization of the interaction of gas molecules with novel porous materials for applications in gas storage and sensors for pollutant detection”.

RTD's research activity will focus on MOFs and COFs systems with promising features in gas storage and as sensors, acquired in the framework of collaborations with other research groups. The employment of growth methods for bulk and/or film phase samples as well as of structural and morphological analysis techniques is envisaged. Solid state spectroscopy techniques, including Far-IR with synchrotron radiation and micro-Raman at low wavelengths, also under conditions of high temperatures and pressures, will be employed for structural characterizations and for the investigation of the material adsorption processes. The study will focus on systems that can be used in optical, electrochemical, and field-effect transistor sensors. The RTD will operate independently on the aforementioned topics. For the research activity at the company, development of sensors and / or spectroscopic techniques is envisaged.

Spectroscopy and Computational Chemistry Group – SC², Mentor Prof. Elisabetta Venuti

from August 2020 to December
2021

Senior Koshland PostDoctoral Fellowship, Funded by ERC grant

Department of Chemical and Biological Physics – Weizmann Institute of Science

Perlman Building, Rehovot 76100, ISRAEL

<https://www.weizmann.ac.il> <https://www.weizmann.ac.il/materials/Yaffe/>

“Influence of the *e-ph* couplings on spectral and charge transport properties in organic semiconductor”.

Organic semiconductors (OSCs) represent an appealing perspective for electronics industry in view of several attractive features, such as easy and low-cost production, flexibility, and transparency. Charge transport modelling and system characteristics tailoring aimed at improving performance is a hard task, since OSCs have relatively narrow bandwidth and a complex phonon structure, and therefore the understanding of the charge transport mechanism also requires a proper understanding of the electron-phonon (*e-ph*) interaction. Indeed, the frequencies of the lattice phonons in organic molecular crystals are generally lower than those of both internal modes and lattice phonons in covalently-bonded inorganic crystals, as a result of the large masses and inertia moments of the organic molecules, as well as of the weak intermolecular van der Waals forces which act between them. As a consequence, at room temperature, thermally excited phonons play a key role in the interactions with excitons and charge carriers in these systems. In the conventional approach, *e-ph* interaction is separated into Holstein (local) and Peierls (nonlocal) coupling. In this Project, the aim is the quantitative studying of *e-ph* coupling processes in organic semiconductors, using as a probe Raman spectroscopy both in the intramolecular (molecular vibrations) and intermolecular modes (lattice phonons), thus detecting the spectral markers of the phenomenon as a function of temperature. Raman spectroscopy will be performed on single crystal OFETs “in operando” to detect simultaneously the system mobilities, and the possible changes of spectral features that accompany the presence of the electric field and the charge transport.

Solid-state structural dynamics group, Mentor Dr. Omer Yaffe

from July 2017 to June 2020

Marie-Curie PostDoctoral Research Fellowship, Funded by P-Sphere MC project Institut de Ciència de Materials de Barcelona - Consejo Superior de Investigaciones Científicas (ICMAB-CSIC)

Campus de la UAB 08193 Bellaterra, Spain, 08193 Bellaterra, Barcelona.

<http://www.icmab.es> <https://departments.icmab.es/molecularelectronics/>

“Polymorphism and morphology control in flexible organic electronic devices”

In the last decade, flexible organic electronics has witnessed an impressive boost arisen from research fields such as wearable and implantable electronics.

The main objective of this project resides on using soluble organic semiconductors (OSCs) coupled to plastic substrates for the fabrication of Organic thin film transistors (OTFTs) using low cost and large area suitable solution coating methods.

Among soluble OSCs of interest, it has been selected 6,13-Bis(triisopropylsilylethynyl)pentacene, benzothienobenzothiophene, tetrathiafulvalene and tetracyanoquinodimethane derivatives.

Due to the wide choice of materials, the study will be planned to sort out the proper procedures and methods for achieving donor-acceptor co-crystal characterized by noticeable air-stability as well as ambipolar properties. A number of physical and chemical parameters, such as crystallization agents, surface and coating modifications, deposition temperature, etc. will be systematically investigated to study their effect on the layer organization and growth, which play a crucial role in charge transport properties.

X-ray, Atomic Force Microscopy and spectroscopic methods will be used to identify and characterize crystal structures in organic thin film transistors. Charge-transport features will be correlated to the crystal structure achieved by the different deposition protocols. Once obtained such flexible OTFTs, they will be object of more sophisticated investigations upon the effect of the mechanical stress (e.g. bending, stretching etc.). According to the electrical performances of these devices, it will be explored the possible areas of applications such as mechanical sensors, transducers or passive elements for basic circuitry.

Nanomol group - Marta Mas-Torrent's Research Group, Mentor Dr. Marta Mas-Torrent

from January 2015 to June 2017

PostDoctoral Research Fellowship, Funded by the Solid State Research Group

University of Bologna, Department of Industrial Chemistry “Toso Montanari”

Viale del Risorgimento n.4, 40136, Bologna – Italy

<http://www.chimica-industriale.unibo.it>

“Structure, Dynamics and Reactivity in Molecular Crystals”

The research project focuses on the study of structural and dynamical properties and photoinduced processes in organic materials, mainly by means of spectroscopic methods. Systems of special interest are molecular crystals of compounds suitable for applications in organic electronics. The main goal is to extend the knowledge of suitable systems for applications in basically two directions: a) by tackling the important topic of polymorphism in small molecule organic semiconductors and b) by studying a newly revisited class of compounds known as Charged Transfer (CT) mixed crystals. Photo-reactivity in the solid state, that is an interesting way of putting photons to work with Organic Materials, will also be investigated. The problem of polymorphism will be extended to molecules of pharmaceutical interest in bulk and in thin film structure studying the influence of different substrates.

Solid State Research Group, Prof. E. Venuti.

from January to April 2016

Visiting PostDoc

Institut de Ciència de Materials de Barcelona (ICMAB-CSIC)

Campus de la UAB, E-08193, Bellaterra, Barcelona - Spain

<http://projects.icmab.es/nanomol/index.php>

“Crystal growth and characterization of charge carrier mobility in organic donor-acceptor binary systems”

The research activity covered two main topics. The first concerned the optimization of the growth procedure for a new class of organic semiconductors based on donor-acceptor binary systems. Single crystals of the system Perylene-F₂TCNQ with stoichiometries 1:1 and 3:2 were obtained by solution method and their charge carrier mobility was characterized by SCOFET (Single Crystal Organic Field Effect Transistor) method. The second topic dealt with the crystal growth by the electrocrystallization method of a new class of organic compounds, with the goal of constructing ordered and electroactive molecular solids.

Nanomol group, Supervisors Prof. J. Veciana and Prof. C. Rovira.

from January to August 2014

Visiting PhD student

University of Bath, Department of Physics
Claverton Down, BA2 7AY, Bath - United Kingdom

<http://people.bath.ac.uk/edc25/>

“Doped organic semiconductors based on binary crystals”

The research was based on crystal growth by PVT technique and characterization of charge transfer (CT) cocrystals, obtained by combining the polyaromatic hydrocarbon perylene with 7,7,8,8-tetracyanoquinodimethane (TCNQ-F₀) and its fluorinated derivatives of increasing electronegativity. This was achieved by varying the amount of fluorine substitution on the aromatic ring, with TCNQ-F₂ and TCNQ-F₄. It was possible to identify structures differing in the stoichiometry. In details: for the system perylene:TCNQ-F₀ ratios 1:1 and 3:1 were found; for the systems systems perylene:TCNQ-F_x (x=2,4) ratios 1:1 and 3:2. The conditions in which the crystal structure can be in principle designed a priori were demonstrated and the structural motifs were analysed on the bases of the degree of charge transfer between the perylene donor and the TCNQ-F_x acceptors, determined from IR measurements.

Centre for Photonics and Photonic Materials – Molecular Optoelectronics group, Supervisor Prof. E. Da Como

from November 2012 to January 2013

Visiting PhD student

Université de Strasbourg, Institut de Science et d'Ingénierie Supramoléculaires (ISIS)
allée Gaspard Monge 8, 67083, Strasbourg - France

<https://isis.unistra.fr/>

“Photoluminescence study of ultra-thin films of PDI-8CN2 n-type organic semiconductor and Synthesis of new platinum complexes”

Subject of this project was the study of the photoluminescence of high vacuum deposition grown ultra-thin films (sub-monolayers and monolayers, ML) of N,N'-bis(n-octyl)-dicyanoperylene-3,4:9,10-bis dicarboximide (PDI8-CN2), a typical representative of n-type semiconductors. Inspecting the photoluminescence (PL) spectra of films, from sub-ML to a few ML thick, it was possible to get information on the correlation between growth mechanisms of the films on the substrate and their PL spectra.

A second topic was the synthesis of neutral platinum(II) complexes based on N⁻N⁻N dianionic tridentate and perylene bifunctionalized ancillary. The synthesis of asymmetric systems and the introduction of different functional groups on the dianionic tridentate ligands should allow for improved solubility and therefore for a decreased tendency to aggregation typical of these systems and due the strong π-π and Pt-Pt interactions.

Laboratoire de Chimie et des Biomateriaux Supramoléculaires, Prof. L. De Cola, Supervisor Dr. M. Mauro.

from November to December 2011

Research grant, Funded by “Toso Montanari” Foundation

Ludwig-Maximilians-Universität München, Department für Physik und Center for Nanoscience (CeNS)
Amalienstr. 54 (2nd floor), D-80799, München – Germany

<http://www.phog.physik.lmu.de>

During this time the main activities were focalized on the development of new setup for coupling a Raman spectrometer with a Scanning Electron Microscope (SEM) to particular attention to the phonon lattice range down to 150 cm⁻¹ for combined study of morphological, structural, and chemical changes in organic single crystal reactions.

Group Photonic and optoelectronic, Prof. J. Feldmann, Supervisor Dr. E. Da Como.

from September 2007 to June 2008

Teaching fellow

Istituto Istruzione Secondaria Superiore ISS "Galileo Galilei"
Via J. Barozzi n°4, 41037, Mirandola, Modena - Italy

<http://www.galileimirandola.it>

High school teaching fellow. During this period, I was responsible for the courses of Chemistry and Physics for four classes.

EDUCATION AND TRAINING

From January 2012 to December
2014

Ph.D. - Doctor Europeus in Chemistry (curriculum Physical Chemistry)

Excellent

Title: *“Structure, Dynamics and Reactivity in the Organic Solid State: Anthracene Derivatives and Charge Transfer Crystals”*

The work presented in this thesis tackles some important points concerning the collective properties of two typical categories of molecular crystals, i.e., anthracene derivatives and charge transfer crystals. Anthracene derivatives have constituted the class of materials from which systematic investigations of crystal-to-crystal photodimerization reactions started, developed and have been the subject of a new awakening in the recent years. In this work some of these compounds, namely, 9-cyanoanthracene, 9-anthracenecarboxylic acid and 9-methylanthracene, have been selected as model systems for a phenomenological approach to some key properties of the solid state, investigated by spectroscopic methods. The present results show that, on the basis of the solid-state organization and the chemical nature of each compound, photo-reaction dynamics and kinetics display distinctive behaviors, which allows for a classification of the various processes in topochemical, non-topochemical, reversible or topophysical. The second part of the thesis was focused on polymorphism in organic materials and charge transfer crystals for organic electronics applications. The binary systems formed by stoichiometric combinations of the charge donating perylene (D) and the charge accepting tetracyano-quinodimethane (A), this latter also in its fluorinated derivatives, has been investigated. The work was focused on the growth of single crystals, some of which not yet reported in the literature, by PVT technique. Structural and spectroscopic characterizations have been performed, with the aim of determining the degree of charge transfer between donor and acceptor in the co-crystals.

▪ University of Bologna – Italy. Supervisor Prof. Aldo Brillante

From October 2009 to October
2011

Master degree in Industrial Chemistry

110/110

Title: *“Spectroscopic study of the crystal-to-crystal photochemical reaction of 9,10-dinitroanthracene to anthraquinone”*

The photochemical reaction of 9,10-dinitroanthracene (DNO₂A) to anthraquinone (AQ) has been studied by means of lattice phonon Raman spectroscopy in the spectral region 10–150 cm⁻¹. While analysis of the lattice modes allowed for the study of the physical changes, the chemical transformation was monitored by measuring the intramolecular Raman-active modes of both reactant and product. On the basis of the experimental data it has been possible, at a microscopic level, to infer information on the reaction mechanism by simultaneously detecting molecular (vibrational modes) and crystal structure (lattice phonons) modifications during the reaction. At a macroscopic level it has been detected a relationship between incident photons and mechanical strain. To clarify the mechanisms underlying the relationship between incoming light and molecular environment, the study was extended to high pressure up to 2 GPa by Diamond Anvil Cell (DAC).

▪ University of Bologna – Italy. Supervisor Prof. Aldo Brillante

From September 2005 to October
2009

Bachelor degree in Industrial Chemistry

108/110

Title: *“Vibrorotational analysis of the stretching vibration ν_1 of $H^{120}SnD_3$.”*

Stannane, SnH₄, has been studied both theoretically, using high-level *ab initio* methods, and experimentally, using high-resolution spectroscopy to analyze the Sn–H stretching fundamental band of the H¹²⁰SnD₃ isotopologue. H¹²⁰SnD₃, present as minor isotopologue in ¹²⁰SnD₄, has been studied by Fourier transform spectroscopy at an effective resolution of ca. 0.005 cm⁻¹ near 1900 cm⁻¹ and the ν_1 band was identified. About 360 ro–vibration transitions with J' up to 18 and K up to 10 have been assigned. Since the spectrum evidenced the existence of some perturbations, the transitions were analyzed either neglecting, or including in the model A₁/E Coriolis–type interactions with nearby dark states.

▪ University of Bologna – Italy. Supervisor Prof. Giandomenico Nivellini

From September 2001 to June
2005

High School Diploma

100/100

Technical Institute for Industrial Chemistry.

Cassino, Frosinone - Italy

PERSONAL SKILLS

Mother tongue(s) Italian

Other language(s)	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	C1	C2	C1	C1	C2
Spanish	B1	B1	B1	B1	B2

Levels: A1/A2: Basic user - B1/B2: Independent user - C1/C2 Proficient user
[Common European Framework of Reference for Languages](#)

Social skills and competences

Thesis co-tutorship

- I co-supervised the thesis of Sara Zaccheroni, bachelor student of the Industrial Chemistry Faculty at the University of Bologna. Thesis title: "Photodimerization reaction of 9-cyano anthracene in solid state" (2012).
- I co-supervised the thesis of Roberta D'Addario, bachelor student of the course Chemistry and technology for materials and the environment of the Industrial Chemistry Faculty at the University of Bologna. Thesis title: "Optimization of the toughness of ceramic materials based on zirconia (TZP) by means micro-Raman spectroscopy." (2012).
- I co-supervised the thesis of Joe Socci, master student of the Chemistry Faculty at the University of Cardiff (UK). Thesis title: "Polymorph identification of Rubrene by lattice phonon micro-Raman spectroscopy." (2015).
- I co-supervised the thesis of Andrea Giunchi, bachelor student of the Industrial Chemistry Faculty at the University of Bologna. Thesis title: "The organic semiconductor Perylene-Tetracyanoquinodimethane and its fluorinated derivatives: a theoretical study." (2015).
- I co-supervised the thesis of Christian Milano, bachelor student of Industrial Chemistry Faculty at the University of Bologna. Thesis title: "Acridine polymorphism: theoretical and experimental study." (2016).
- I co-supervised the thesis of Arianna Rivalta, master student of Industrial Chemistry Faculty at the University of Bologna. Thesis title: "Polymorphism in the active pharmaceutical ingredient paracetamol." (2016).
- I co-supervised the thesis of Alice Fiocco, bachelor student of Industrial Chemistry Faculty at the University of Bologna. Thesis title: "Polymorphism in natural-inspired semiconductors indigo and thioindigo." (2016).
- I co-supervised the thesis of Andrea Giunchi, master student of Industrial Chemistry Faculty at the University of Bologna. Thesis title: "Theoretical investigation on the molecular crystals of indigo and alkyl derivatives of 2,3-thieno(bis)imide" (2017).
- I co-supervised the thesis of Lorenzo Pandolfi, bachelor student of Industrial Chemistry Faculty at the University of Bologna. Thesis title: "Raman characterization of organic pigments: 6,6'-dibromoindigo and quinacridone" (2017).
- I co-supervised the thesis of Maria de la Nieves Montse, bachelor student of Chemistry and Physics Faculty at the University Autonomous of Barcelona. Thesis title: "Control of polymorphism of DiF-TEAS-ADT in OFET by polymer blend with bar assisted meniscus shearing technique." (2019).
- I co-supervised the thesis of Matteo Collina, master student of Industrial Chemistry Faculty at the University of Bologna. Thesis title: "Chemical functionalization and characterization of organic pigments for OFET applications." (2019).
- I co-supervised the thesis of Lorenzo Pandolfi, master student of Industrial Chemistry Faculty at the University of Bologna. Thesis title: "Photocycloaddition of solid solutions of cinnamic acid salts." (2019).
- I co-supervised the PhD thesis of Lorenzo Pandolfi, PhD student of Industrial Chemistry Department at the University of Bologna. Thesis title: "Spectroscopic investigation on photoreactivity, structure and polymorphism of organic molecular crystals" (2023)
- I supervised the thesis of Italo Rivero, bachelor student of Industrial Chemistry at the University of Bologna. Thesis title: "Terahertz IR per lo studio di cristalli molecolari organici – terahertz for the study of molecular organic crystals." (2023).
- I am co-supervising Alessandro Suprani Industrial Chemistry at the University of Bologna (2023/2024).
- I am the supervisor of Sara Pandolfi, PhD student at the University of Bologna (2023-2025).

Visiting student co-tutorship

- I co-supervised the visiting PhD Student Josè Luis Zafra Paredes during his third year (10/09/2013 – 10/12/2013). Project title: "Lattice phonon characterization of polymorphism in quinoidal thiophene dimers and TTF-TCNE systems." (2013).
- I co-supervised the visiting master Student Benedikt Schrode (Technical University of Graz) during his thesis work (24/11/2014 – 17/12/2014). Thesis title: "Crystal Structure Determination of O-BTBT films by Raman and Infrared Spectroscopy." (2014).
- I co-supervised the visiting PhD Student Javier Fernandez-Castanon during his first year (22/07/2015 – 01/07/2015). Project title: "Characterization of a new polymorph of coronene induced by magnetic field growth." (2013).
- I co-supervised the visiting master Student Fabian Muralter (Technical University of Graz) during his thesis work (13/06/2016 – 22/07/2016). Thesis title: "Fabrication and characterization of AlQ₃ thin films." (2016).

Organisational / managerial skills

- Responsible for the lab 3.32 of the NANOMOL group (ICMAB-CSIC)
- Responsible for the lab 073 and 074 of the Department of Industrial Chemistry (University of Bologna)
- Good attitude to organize activities in the research group.
- I was involved in the organization of Italian Meeting on Raman Spectroscopies and Non Linear Optical Effects (GISR2012), 06-08/06/2012, Bologna (Italy).
- Member of the Organizing committee of the ASC winter school 2023 “Spectroscopy at different length and time scales”, Chemistry Campus in Bologna, from the 13th to 17th of February 2023.
- Responsible WP5 for UNIBO partner of the PNRR iEntrance project, UNIBO coordinator Prof. Loris Giorgini (total budget: 75.2 MEuro, budget UNIBO: 3.95 MEuro)

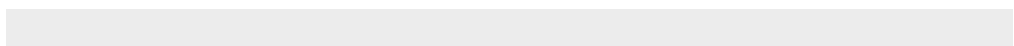
Technical skills and competences

- Raman and Infrared spectroscopy
- Crystal growth techniques
- THz-IR and resonance Raman by Synchrotron light
- Thin film fabrication by solution and evaporation methods
- UV-Vis-NIR spectroscopy characterization in solid state
- Steady state and time resolved photoluminescence.
- Optical microscopy
- Confocal laser scanning microscopy
- Scanning electron microscopy coupled with Raman spectroscopy.

Digital competence

SELF-ASSESSMENT				
Information processing	Communication	Content creation	Safety	Problem solving
Proficient user	Proficient user	Proficient user	Independent user	Proficient user

Levels: Basic user - Independent user - Proficient user
[Digital competences - Self-assessment grid](#)



- OS Microsoft Windows 95/98, XP, 7, 10.
- OS Linux (Mint, Ubuntu, Kubuntu, Debian)
- Microsoft Office, OpenOffice e LibreOffice.
- Browser internet Firefox, Chrome, Internet Explorer
- E-mail client Microsoft Outlook, Thunderbird, Eudora.
- Software for the elaboration of the experimental “Home-made” and commercial (OriginLab, Igor, MatLab, Datlab, Grace, Gwyddon)
- Software for Image manipulation (Adobe Photoshop, Gimp)
- Software vector graphics (Corel Draw, Inkscape)
- Software package ChemOffice.
- Good knowledge of the HTML and PHP languages

Other skills

- Tutor for Laurea Triennale in Industrial Chemistry, Faculty of Industrial Chemistry, University of Bologna, 150 hours. (Accademic year 2010/2011).
- Tutor for the laboratory of the course "Chimica fisica dei materiali e laboratorio di chimica fisica" - Bachelor degree in Laurea in Chimica e tecnologie per l'ambiente e per i materiali, Prof. Alberto Arcioni, 30 hours (Academic year 2016/2017).
- Laboratory teaching for the course "Physical chemistry of the solid state" - Master degree in Industrial Chemistry. Chair Prof. Aldo Brillante, 4 hours (Academic year 2012/2013).
- Laboratory teaching for the course "Physical chemistry LM" - Master degree in Industrial Chemistry. Chair Prof. Roberto Berardi, 20 hours (Academic year 2013/2014).
- Teaching for the course "Physical chemistry LM" - Master degree in Industrial Chemistry. Chair Prof. Elisabetta Venuti, 2 hours (Academic year 2014/2015).
- Teaching in charge of the course 67063 - Materials Chemistry and Physical Chemistry Laboratory (Module 2) Campus Ravenna – University of Bologna, 40 hours (A.A. 2022/2023).
- Teaching in charge of the course 67063 - Materials Chemistry and Physical Chemistry Laboratory (Module 2) Campus Ravenna – University of Bologna, 40 hours (A.A. 2023/2024).
- Teaching in charge of the course 66689 - Physical Chemistry II and Laboratory (Module 3) Campus Bologna – University of Bologna, 59 hours (A.A. 2023/2024).

Driving licence European Driving License Category A and B

 ADDITIONAL INFORMATION

Topical Advisory Panel Member for Crystals journal.
 Co-Editor Special Issue in Crystals: Raman Spectroscopy of the Organic Solid State
 Reviewer for MDPI, American Chemical Society and Royal Chemical Society.
 Coauthor of 65 publications on international journals, with 840 citations and h-index 18 on Google Scholar (February 11th 2024). Author ID on Scopus: 55427280700. Corresponding authorship (24).

Conferences

Conferences and topical meetings

1. **“FUTURMAT2”** 2nd International meeting on Organic Materials for a better future. September 16/20 2012, Riva Marina Resort, Brindisi (Italy).
2. **IVS (Israeli Vacuum Society) Student Conference 2021**, ONLINE via Zoom on July 15, 2021, Israel

Oral contributions

1. **“GISR 2012”** II National congress of Raman spectroscopy and non linear optical effects, CNR Bologna (Italy), 6-8 june 2012. Title: *“Raman study of the crystal to crystal photochemical reaction of 9,10 - dinitroanthracene to anthraquinone”*. Book of Abstract: pag TA-27
2. **“GISR 2014”** III National congress of Raman spectroscopy and non linear optical effects, Università degli Studi di Parma (Italy), 9-11 june 2014. Title: *“Micro Raman investigation of the photodimerization reaction of 9-cyanoanthracene in the solid state”*. Book of Abstract: pag OM-06
3. **“E-MRS 2015” Spring Meeting** –Symposia Q: Organic semiconducting single crystals: from fundamentals to advanced devices -, GrandPalais Lille (France), 11-15 May 2015. Title: *“Charge Transfer crystals of Perylene-F_xTCNQ”*. Book of Abstract: QQIII.5
4. **“Surface induced crystal structures”** 7th Workshop -, Université libre de Bruxelles, Brussels (Belgium), 28-29 May 2015. Title: *“Polymorphism and Phase Mixing in 9,10-diphenylanthracene crystal a Micro-Raman Study”*.
5. **“Substrate-Mediated Polymorphism in Organic Thin Films”** 8th Workshop -, Humboldt Universität zu Berlin - IRIS Adlershof, Berlin (Germany), 24-26 October 2016. Title: *“Polymorphism in Indigoids Revisited by Lattice Phonon Spectroscopy”*.
6. **“XLVI National meeting of the Physical Chemistry Division of the Italian Chemistry Society”**, University of Bologna, Bologna (Italy), 25-28 June 2018. Title: *“Solution-Processed DBTTF-TCNQ charge transfer complex for ambipolar OFETs”*. Book of Abstract: TH.02
7. **“MRS 2021” Spring Meeting** –Symposia EL01.11: Organic Ionic Conductors I -, Virtual meeting, 17-23 April 2021. Title: *“Enhancing Long-Term Device Stability Using Thin-Film Blends of Small Molecule Semiconductors and Insulating Polymers to Trap Surface-induced Polymorphs”*.
8. **“MRS 2022” Spring Meeting** –Symposia QT01: Applications and Characterization of Nonequilibrium Electron, Phonon and Polaron Dynamics, Virtual meeting, 23-25 May 2022. Title: *“Polarons in Highly-Polarizable, Chalcogenide Perovskites Semiconductors”*.
9. **“VISPEC 2023”** – Vibrational Spectroscopy Conference, held at the Sala dei Notari (Palazzo dei Priori) Perugia (Italy), 14-16 June 2023. Title: *“Mode softening driven bilayer to monolayer phase transition in Ph-BTBT-10 organic semiconductor”*.

Invited speaker

1. **“ICG 2017”** Italian Crystal Growth – materials and methods in crystal growth, University of Milano-Bicocca, Milan (Italy), 20-21 November 2017. Title: *“Bulk and thin film polymorphs in nature inspired semiconductors by Raman microscopy”*.
Book of Abstract: pag T3-2 (Invited Keynote)
2. **“NanoTR17”** - 17th International Nanoscience and Nanotechnology Conference, Izmir Institute of Technology (IZTECH), İzmir/Turkey, from 29th to 30th of August 2023. Title: *“Crystal dynamics probed by THz Raman spectroscopy”*.
Book of Abstract: pag 15, ID330 (Invited Speaker)

1. **“RamanFest Symposium”** Conference on advanced applied Raman Spectroscopy, Lille (France), 23/24 May 2013. Title: *“Polymorphism and phase recognition of molecular crystals probes by lattice phonons Raman microscopy”*. Book of Abstract: pag 49
2. **“PLC Workshop 2013 – 7th Ed. Crystal Forms @ Bologna”** Multiple crystal forms: sword of Damocles or opportunity for the pharma industry?, Bologna (Italy), 9-11 June 2013. Title: *“Lattice phonons and XRD: a synergy for structure identification. Application to 9-anthracene-carboxylic acid.”*.
3. **“GISR 2014”** III National congress of Raman spectroscopy and non linear optical effects, Università degli Studi di Parma (Italy), 9-11 June 2014. Title: *“A study of pseudo-polymorphism in 9-anthracene-carboxylic acid by lattice phonons Raman microscopy and XRD”*. Book of Abstract: pag P-22
4. **“ICOE 2014”** The 10th International Conference on Organic Electronics, University of Modena and Reggio Emilia UNIMORE (Italy), 11-13 June 2014. Title: *“Micro-Raman study of polymorphism and phase mixing in the semiconductor 9,10-diphenylanthracene crystals”*. Book of Abstract: pag 110
5. **“ICOE 2014”** The 10th International Conference on Organic Electronics, University of Modena and Reggio Emilia UNIMORE (Italy), 11-13 June 2014. Title: *“Molecular organization of π - π stacked PDI8-CN₂ ultra-thin films on a silica substrate”*. Book of Abstract: pag 112
6. **“PLC Workshop 2015 – The 8th Bologna Convention on crystal forms”** – Crystal in Food & Farma, Zanhotel Europa - Bologna (Italy), 14-16 June 2015. Title: *“Structure identification of Paracetamol by lattice phonon Raman microscopy”*.
7. **“E-MRS 2015” Spring Meeting** –Symposia Q: Organic semiconducting single crystals: from fundamentals to advanced devices -, GrandPalais Lille (France), 11-15 May 2015. Title: *“Polymorphism and phase mixing in 9,10-diphenylanthracene crystal”*. Book of Abstract: QQI.15
8. **“RamanFest Symposium”** Conference on advanced applied Raman Spectroscopy, Berlin-Adlershof - Science and Technology Park, Berlin (Germany), 19-20 May 2016. Title: *“The clever use of Raman spectroscopy to monitor molecular and crystal structure in organic solid state photoreactions”*. Book of Abstract: pag 100.
10. **“XLVI National meeting of the Physical Chemistry Division of the Italian Chemistry Society”**, University of Bologna, Bologna (Italy), 25-28 June 2018. Title: *“Temperature-induced phase transition of Coronene: a spectroscopic and theoretical recognition”*. Book of Abstract: P34
11. **“2nd International Conference on Interface Properties in Organic and Hybrid Electronics: Perspectives & Key Challenges”**, Cergy-Pontoise University, (France), July 8-11, 2019. Title: *“Controlling polymorphism in OTFT of BTBT derivative by bar assisted meniscus shearing solution blend”*. Book of Abstract: P52 (pag. 114)
12. **“9th Annual Conference of the Marie Curie Alumni Association (MCAA)”**, Lisbon, (Portugal), March 25-27, 2022. Title: *“Visualizing a SCSC photodimerization through its lattice phonons dynamics”*. Book of Abstract: pag. 22

Seminars

1. Institut de Science et d'Ingénierie Supramoléculaires (ISIS), University of Strasbourg, Strasbourg (France) Laboratoire de Chimie et des Biomatériaux Supramoléculaires, Prof. L. De Cola. *“PHOTOCHEMICAL REACTIONS IN ORGANIC SINGLE CRYSTALS”*.
2. Department of Physics, University of Bath, Bath (United Kingdom) Centre for Photonics and Photonic Materials, *“CRYSTAL TO CRYSTAL PHOTOCHEMICAL REACTIONS PROBED BY MICRO-RAMAN SPECTROSCOPY”*. 12/02/2014
3. Institut de Ciència de Materials de Barcelona - Consejo Superior de Investigaciones Científicas (ICMAB-CSIC), Nanomol Group Prof. J. Vaciána, *“MOLECULAR CRYSTALS AND LIGHT: CHEMICAL REACTIONS IN CAGE”*. 19/04/2016
4. Institut de Ciència de Materials de Barcelona - Consejo Superior de Investigaciones Científicas (ICMAB-CSIC), Nanomol Group Prof. J. Vaciána, *“SURFACE INDUCED POLYMORPHISM: SWORD OF DAMOCLES OR OPPORTUNITY FOR MATERIAL SCIENCE?”*. 23/04/2019
5. Institut de Ciència de Materials de Barcelona - Consejo Superior de Investigaciones Científicas (ICMAB-CSIC), Nanomol Group Prof. J. Vaciána, *“Polymorphism and morphology control in flexible organic electronic devices.”* 18/02/2020
6. Università degli Studi dell'Aquila – Dipartimento di chimica, TMS - Thursday Morning Science, *“Probing Crystal Dynamics by low-frequency Raman Spectroscopy.”* 25/03/2021
7. Ben-Gurion University of the Negev (Israel) *“Probing Crystal Dynamics by low-frequency Raman Spectroscopy.”* 01/09/2021
8. Institut de Ciència de Materials de Barcelona - Consejo Superior de Investigaciones Científicas (ICMAB-CSIC), e-MolMat Group Prof. M. Mas-torrent, *“Lattice dynamics in Chalcogenide Perovskites BaZrS₃.”* 03/05/2022

Publications

Full list of publications

1. Luciano Fusina, Gian Domenico Nivellini, **Tommaso Salzillo**, Manuele Lamarra, Riccardo Tarroni. *Ab initio quartic force field of stannane and rotational analysis of the ν_1 infrared band of $H^{120}SnD_3$* . *J. Chem. Phys.* 137, 204316 (2012); DOI: 10.1063/1.4767720
2. **Tommaso Salzillo**, Ivano Bilotti, Raffaele Guido Della Valle, Elisabetta Venuti, Aldo Brillante. *Crystal to crystal photoinduced reaction of dinitro-anthracene to anthraquinone*. *J. Am. Chem. Soc.*, 2012, 134 (42), pp 17671–17679; DOI: 10.1021/ja307088n
3. **Tommaso Salzillo**, Sara Zaccheroni, Raffaele Guido Della Valle, Elisabetta Venuti, Aldo Brillante. *Micro Raman investigation of the photodimerization reaction of 9-cyanoanthracene in the solid state*. *J. Phys. Chem. C* 118, 9628-9635 (2014); DOI: 10.1021/jp412484x
4. Francesca Di Maria, Eduardo Fabiano, Denis Gentili, Mariano Biasiucci, **Tommaso Salzillo**, Giacomo Bergamini, Massimo Gazzano, Alberto Zanelli, Aldo Brillante, Massimiliano Cavallini, Fabio Della Sala, Giuseppe Gigli and Giovanna Barbarella. *Polymorphism in Crystalline Microfibers of Achiral Octithiophene: The Effect on Charge Transport, Supramolecular Chirality and Optical Properties*. *Adv. Func. Mater.* 24, 31, pp. 4943–4951 (2014); DOI: 10.1002/adfm.201400534
5. Federica Burgio, Paride Fabbri, Giuseppe Magnani, Matteo Scafè, Luciano Piloni, Alida Brentari, Aldo Brillante, **Tommaso Salzillo**. *Cf/C composites: correlation between CVI process parameters and Pyrolytic Carbon microstructure*. *Frattura e integrità strutturale* 30, 68-74 (2014); DOI: 10.3221/IGF-ESIS.30.10
6. Francesca Mazzanti, Giuseppe Magnani, Selene Grilli, Aldo Brillante, **Tommaso Salzillo**, Alida Brentari, Emiliano Burresti, Claudio Mingazzini, Paride Fabbri. *Microstructural characterization of activated carbon obtained from waste tires*. *Advances in Science and Technology* 87, 79-84 (2014); DOI: 10.4028/www.scientific.net/AST.87.79
7. **Tommaso Salzillo**, Arianna Rivalta, Elisabetta Venuti, Giuseppe Magnani, Aldo Brillante. *Spettroscopia Raman e polimorfismo: il ruolo dei fononi*. *La Chimica e l'Industria* 5, 51-54 ISSN 0009-4315, (September/October 2015). DOI: <http://dx.medra.org/10.17374/CI.2015.97.5.51>
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61. Rufaro Kawondera, Marco Bonechi, Irene Maccioni, Walter Giurlani, **Tommaso Salzillo**, Elisabetta Venuti, Debabrata Mishra, Claudio Fontanesi, Massimo Innocenti, Gift Mehlana, Wilbert Mtangi. Chiral "doped" MOFs: an electrochemical and theoretical integrated study. *Frontiers in Chemistry* 11 (2023).
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62. Andrea Stefani, **Tommaso Salzillo**, Patrizia Romana Mussini, Tiziana Benincori, Massimo Innocenti, Luca Pasquali, Andrew C Jones, Suryakant Mishra, Claudio Fontanesi. Chiral Recognition: A Spin - Driven Process in Chiral Oligothiophene. A Chiral - Induced Spin Selectivity (CISS) Effect Manifestation. *Advanced Functional Materials*, 34, 2, 2308948 (2024).
DOI: 10.1002/adfm.202308948
63. **Tommaso Salzillo**, Jinghai Li, Raphael Pfattner, Elisabetta Venuti, Marta Mas-Torrent, Francesco D'Amico. Probing molecular arrangements of the organic semiconductor 2, 7-Dioctyl [1] benzothieno [3, 2-b][1] benzothiophene thin film at the interface by UV Resonant Raman scattering. *Surfaces and Interfaces*, 44, 103752 (2024). [Corresponding author]
DOI: 10.1016/j.surfin.2023.103752
64. Elena Ferrari, Matteo Masino, Lorenzo Pandolfi, Guillaume Schweicher, Yves Geerts, **Tommaso Salzillo**, Elisabetta Venuti. Structural Order and Thermal Behavior of Ph-BTBT-10 Monolayer Phases. *The Journal of Physical Chemistry*, *Just accepted* (2024).

Honours and awards

- ✓ "Toso Montanari" grant for Master Thesis abroad (2011) - University of Munich LMU, Germany
- ✓ "Marco Polo" Fellowship (2012) - Visiting period University of Strasbourg, France
- ✓ "Marco Polo" Fellowship (2014) - Visiting period University of Bath, UK
- ✓ "Marco Polo" Fellowship (2015) - Visiting period at Institut de Ciència de Materials de Barcelona, Consejo Superior de Investigaciones Científicas, Barcelona, Spain.
- ✓ Juan de la Cierva incorporación Fellowship (2019), Spain
- ✓ Koshland Fellowship (2020), Israel
- ✓ Rita Levi Montalcini 2020

Grants

- ✓ Alma Attrezzature 2023, PI (16.5 KEuro)
- ✓ PRIN PNRR 2022 (P20227P7WZ), Chiral Coordination Polymers for Energy Applications (CHICOPEA), RL (250 KEuro)
- ✓ Rita Levi Montalcini 2020 (PGR20QN52R), Influence of the electron-phonon coupling on spectral and charge transport properties in organic semiconductors (e-phonon). PI (300 KEuro)
- ✓ ALBA Proposal number 2021095275. Project developed at ALBA Synchrotron facilities (Barcelona – Spain), Beamline BL01-MIRAS. Title: "Substrate-Induced Polymorphism in Copper Based Metal-Organic Frameworks probed by THz IR spectroscopy". (2022)
- ✓ Ceric Proposal number 20217080 funded with travel support. Project developed at ELETTRA Synchrotron facilities (Trieste – Italy), Beamline IUVS. Title: "Understanding the iodine doping mechanism in organic field effect transistors". (2022)
- ✓ Elettra Proposal number 20215021 funded with travel support. Project developed at ELETTRA Synchrotron facilities (Trieste – Italy) SISSI-Mat Science. Title: "THz IR spectroscopy as a probe of Substrate-Induced structures in Copper Based Metal-Organic Frameworks". (2022)
- ✓ Elettra Proposal number 20215865. Project developed at ELETTRA Synchrotron facilities (Trieste – Italy) Beamlines XRD1. Title: "Crystal structure solution of C10-BTBT-Ph/F4TCNQ charge transfer complex". (2021)
- ✓ Combined Ceric Proposal number 20212063 funded with travel support. Project developed at ELETTRA Synchrotron facilities (Trieste – Italy) Beamlines IUVS and SISSI. Title: "Spectroscopic study of natural antioxidants embedded in liposomes as potential drug delivery systems: structure-interaction relation". (2021)
- ✓ Ceric Proposal number 20187028 funded with travel support. Project developed at ELETTRA Synchrotron facilities (Trieste – Italy), Beamline IUVS. Title: "Polymorph identification in Bar-assisted meniscus shearing thin film transistors". (2018)

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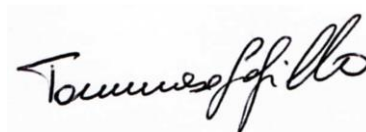
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School and Courses

- ✓ "Raman spectroscopy coupled with scanning electron microscopy" 19/10/2011 one-day seminar at University of Bologna by Renishaw S.p.A.
- ✓ "Smarter spectroscopy" june 2012, one-day seminar in Milan by Thermo Scientific.
- ✓ "CNIF2013 School of photochemistry" June 3rd-6th 2013, Department of chemistry G. Ciamician", Group of Photochemical Nanosciences Laboratories.
- ✓ "2-day hands-on Workshop on Infrared Microspectroscopy" 1st-2nd October 2018, infrared beamline MIRAS. ALBA Synchrotron, Maxwell Auditorium, Carrer de la Llum 2-26, 08290 Ceranyola del Vallès (Barcelona) Spain

Signature

Bologna - Italy, 12/01/2024



(Tommaso Salzillo)