

CURRICULUM VITAE

Assunta Marrocchi, PhD

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Education

1995-1998 - PhD in Chemical Sciences at the University of Perugia (Italy), working on a research project dealing with the design, synthesis, and characterization of helically-shaped polycyclic aromatics.

1993 - Degree in Chemistry at the University of Perugia, Italy, with a diploma work dealing with high-pressure organic synthesis.

Academic Appointments

2015-to date: Associate Professor at the Department of Chemistry, Biology and Biotechnology of the University of Perugia (Italy).

2002-2015: Assistant Professor at the Department of Chemistry, Biology and Biotechnology of the University of Perugia (Italy).

1998-2002: Research Fellow at the Department of Chemistry of University of Perugia (Italy) working mainly on the synthesis and characterization of (chiral) helically-shaped polycyclic aromatics.

1994-1995: Grant Holder at the Department of Chemistry of University of Perugia (Italy).

Main research interests

(1) Biomass sustainable conversion into high added value chemicals and materials (2) Design, sustainable synthesis, and characterization of advanced organic materials for electronics and photonics. (3) Design, synthesis, and characterization of heterogeneous catalysts. (4) Development of bio-based additives for the inhibition of salt crystal growth in porous media and their application in Built Heritage Conservation.

Major Visiting Appointments

2017: Visiting Lecturer at the University of Malta, Faculty for the Built Environment, Department of Built Heritage, within *Erasmus+ Program -Staff Mobility for Teaching Assignment*

2008: Visiting Scientist at Northwestern University (Department of Chemistry, the Materials Research Center, and the Argonne-Northwestern Solar Energy Center), Evanston, IL (USA), working with the research group of Prof. Tobin J. Marks and Prof. Antonio Facchetti. The joint research project focused on the design, synthesis, characterization of π -conjugated semiconducting materials, and their implementation in organic field-effect transistors and solar cells.

2001: Visiting Scientist at the Radboud Universiteit Nijmegen, The Netherlands (Prof. Dr. Hans W. Scheeren group). The research project focused on high-pressure Diels-Alder reaction for the synthesis of natural products.

1998: Visiting PhD student at Technische Universität Braunschweig, Germany, joining the research group of Prof. Dr. Henning Hopf. *Research project:* Development of new methods for the synthesis of helically shaped cyclophanes.

1994: Visiting Scholar at the Radboud Universiteit Nijmegen, The Netherlands (Prof. Dr. Hans W. Scheeren group). *Research project:* High-Pressure Diels-Alder reaction as a new method toward the synthesis of steroidal molecules

Main Collaborations

Prof. Choongik Kim, Sogang University (Seoul, Republic of Korea) (<https://sites.google.com/site/ckimlab/ww>); Prof. Antonio Facchetti, Northwestern University (IL) & Flexterra Inc. (IL), USA (<http://faculty.wcas.northwestern.edu/~afa912/>); Prof. Fabrizio Sarasini, University of Rome Sapienza (I) (<http://dicma.ing.uniroma1.it/node/6036>); Dr Maria Paola Bracciale, University of Rome Sapienza (I) (<https://orcid.org/0000-0002-3863-1188>); Prof. Maria Laura

Santarelli, University of Rome Sapienza (I) (<http://dicma.ing.uniroma1.it/en/node/5774>) Prof. JoAnn Cassar, University of Malta (Malta) (<https://www.um.edu.mt/profile/joanncassar>); Prof. Ombretta Marconi, University of Perugia (I) (https://scholar.google.com/citations?hl=it&user=vLY94hoAAAAJ&view_op=list_works&sortby=pubdate); Dr Michele Sisani (PROLABIN & TEFARM srl, <http://www.prolabintefarm.com/>)

Main Teaching Experiences

- A.Y. 2019/2020-present.** Lecturer of “Polymer Chemistry”, University of Perugia (Italy)
A.Y. 2017/2018-present. Lecturer of “REACH and CLP Regulations and Evaluation of Chemical Risk”, University of Perugia (Italy)
A.Y. 2016/2017-present. Lecturer of “Eco- Bio-compatible Synthetic Processes”, University of Perugia (Italy)
A.Y. 2016/2017-present. Lecturer of “Chemical Processes for Biomass Valorization”, University of Perugia (Italy)

Research supervision of Bachelor/Master students and PhD students in Chemistry, Chemical Sciences, Molecular and Industrial Biotechnology, Biotechnology, Science and Technology for the Conservation and the Restoration of Cultural Heritage, Civil Protection Activities.

- Invited lecturer at *International Nathiagali Summer College 2021* (Pakistan); <https://www.ncp.edu.pk/insc/> . (“Green solvent processable organic electronic devices”).
- Invited lecturer at “Winter School on Biotechnologies” 5th ed. -WSB2019 (“From bio-waste to wealth using green chemistry: engineering a more sustainable society”) and 2nd ed.-WSB2016 (“Developing a Green/ Sustainable Chemistry: definition of chemical processes to exploit biomasses”)
- Teaching Assignments in the frame of PhD accredited Schools (University of Perugia):
 - “Safety in the laboratory and biotechnologies”, PhD School in Biotechnology
 - “Chemical Risk” PhD School in Chemical and Pharmaceutical Sciences (2014) and in Chemical Sciences, **2016-2020**
 - **2015**: “Biocompatible Materials”, PhD School in Chemical Sciences
- PhD Dissertation Defense Committee Member for National/International PhD Schools
- Teaching assignment, Fondazione ITS Umbria - Innovazione Tecnologia e Sviluppo (<http://www.itsumbria.it/>). Unit: “Tecnologie di processo: miscelazione e separazioni chimiche e fisiche” (**2016**)
- Teachers training: The National Plan for Science degrees (PLS), **2021** (“Bioraffinerie e sviluppo sostenibile”)
- Orienteering for schools: #UniPgOrienta Express **2022** (“Plastiche e bioplastiche”)

Invited seminars

- **2016**: Open Lecture “Salt weathering of building stones: causes & remedies”, La Valletta, Malta (07-01-2016, Fortress Builder Museum)
- **2015**: Technische Universität Braunschweig (D), „Organic Materials’ Synthesis for Optoelectronic Device Fabrication and Testing“.
- **2015, 2016**: University of Rome Sapienza. Subject: Organic semiconductors in device applications.
- **2014**: University of Rome Tor Vergata (C.H.O.S.E.). Subject: Synthetic Strategies and Processing to new molecular semiconducting materials.

Awards/Services

- Expert Evaluator of *Research Project* proposal for the Italian MUR. ERC sectors: Organic chemistry (PE5_17), Polymer chemistry (PE5_15)
- Expert Evaluator of *Research Project* proposals for Latvian Science Council (<http://www.lzp.gov.lv/index.php?mylang=english>) and Polish National Science Center (<http://www.ncn.gov.pl>)
- External reviewer of PhD Thesis
- Member of the Committee of the Responsibles of the Departments for Sustainability
- Delegate of the Head of the Department of Chemistry Biology and Biotechnology (University of Perugia) for safety in the workplaces
- Member of the Parithetical Committee for Didactic Activities, DCBB (2020-)
- Academic Coordinator for extra-Erasmus Bilateral Agreements with the University of Malta
- Academic Coordinator for Erasmus+ Bilateral Agreements with the University of Malta (Prof. JoAnn Cassar, ISCED Code: 0531) and with the Sogang University Seoul, Republic of Korea (Prof. Choongik Kim, ISCED Code: 05)
- International Journals reviewed for American Chemical Society, Royal Society of Chemistry, MDPI Publisher, Elsevier, Wiley, Thieme
- Member of the Editorial Board of *Scientific Reports* (Nature Publishing) and *Molecules* (MDPI Publishing)
- Third Finalist at the contest Intellectual Property Award 2019 (PCT Int. Appl. (2017), WO 2017125388 A1 20170727), launched by the Italian Ministry of the Economic Development (MISE) and UIBM (<http://www.uibm.gov.it/index.php/inglese>)
- **2019-2021**: Member of the Directive Committee of the local section of the Italian Chemical Society

Conference Organization

- **2021**: Co-Organizer of the Workshop “Managing the paradigm shift to sustainable conservation. An integrated approach in Built Heritage research”, Malta, April 29-30
- **2018**: Co-Organizer of the 1st Summer School H-CCAT Project (H2020, <http://h-ccat.eu/>), Perugia (Italy); Project reference 720996
- **2009**: Co-organizer of the Conference “Tecnologia fotovoltaica Organica ed Ibrida: stato dell’arte e prospettive”, Perugia (Italy)
- Organizzazione di: XXVI Convegno Interregionale Tosco Umbro Marchigiano Abruzzese (TUMA 2007), Assisi (PG) 26-28 settembre 2007
- **1997**: Co-Organizer of the II National Conference “I Rifiuti in uno Sviluppo Sostenibile”, Perugia (Italy)

Selected Funded Projects (National/International)

- PRIN National Interest Research Program (MUR): A Flexible antibody-drug conjugate Approach for Innovative antiviral THERapy (FAITH) (**2020**; ongoing. Registry n. 20207CNBE4_002) (Participating Member)
- Financial resources assigned by ESF REACT-EU funds (PON "Ricerca e Innovazione" programme 2014-2021) made available with Ministerial Decree 10 August 2021, n. 1061 for a three-years PhD scholarship on green-related topics (“Biosolvents”).
- ITN-ETN STIBNITE, Tailored materials for Sustainable Technologies: programming functional molecular components through Boron-Nitrogen doping, **2020**-ongoing (Participating Member)
- Project Grant awarded by the Internationalisation Partnership & Awards Scheme Plus (IPAS+) 2019 through the Malta Council of Science and Technology (Co-applicant)
- Project grant awarded by University of Perugia, Fondo di Ateneo per la Ricerca di Base, 2019 (Principal Investigator)
- H-CCAT Solid Catalysts for activation of aromatic C-H bonds, Call: H2020-NMBP-**2016**-two-stage; project reference 720996 (Participating Member)

- Project grant awarded by University of Perugia, Fondo di Ateneo per la Ricerca di Base, 2015 (Principal Investigator)
- Fondazione Cassa di Risparmio di Perugia: “Manipolazione di biomassa lignocellulosica per la produzione di additive per biocarburanti” (**2016**, Participating Member) Codice Progetto: 2016.0060.021 RICERCA SCIENTIFICA E TECNOLOGICA.
- Israel-Italy Joint Innovation Program for Scientific & Technological Cooperation in R&D: “Employment of the automatic cyclic continuous-flow reactor technology for the clean large-scale fabrication of organic solar cells” (**2012**); (Participating Member)
- Fondazione Cassa di Risparmio di Perugia: “Sviluppo di nuovi materiali organici per applicazioni elettroniche e fotoniche” (**2009**, Project Code: 2009.010.0444); (Participating Member)
- PRIN National Interest Research Program (MIUR): Catalizzatori, metodologie e processi innovativi per il regio- e stereocontrollo delle sintesi organiche” (**2008**; Registry n. 2008KRBX3B_003); (Participating Member)
- Fondazione Cassa di Risparmio di Perugia: “Conservazione dei Beni Culturali lapidei mediante inibitori di cristallizzazione salina. Due casi-studio: l’Ipogeo dei Volumni ed il Mosaico di Orfeo” (**2006**); (Participating Member)
- PRIN National Interest Research Program (MIUR): “Cicloaddizioni con ridotto impatto ambientale per la sintesi di sostanze di interesse biologico” (**2005**; Registry n. 2005038048_004); (Participating Member)
- Project grant awarded by Fondazione Cassa di Risparmio di Perugia (Indagine sullo sviluppo di nuovi prodotti e sulle applicazioni nel campo della conservazione dei Beni Culturali, 2005; Principal Investigator)
- PRIN National Interest Research Program (MIUR): “Nuove Strategie per la Sintesi Regio-, Diastereo- ed Enantioselettiva di Composti Eterociclici non Aromatici” (**2004**; Registry n. 2004038153_003); (Participating Member)
- Fondazione Cassa di Risparmio di Perugia: “Sviluppo di metodologie innovative per la difesa di strutture in muratura dal degrado causato dalla risalita di umidità” (**2004**); (Participating Member)
- PRIN National Interest Research Program (MIUR): “Nuove Strategie per la Sintesi Regio-, Diastereo- ed Enantioselettiva di Composti Eterociclici non Aromatici” (**2002**; Registry n. 2002031748_004). (Participating Member)

Other Notes

- Lead-Author/Co-Author of over 110 JCR papers, including invited papers; 5 book chapters with ISBN and DOI, two issued patents and two filed patent applications.
- Lead-Author/Co-Author of over 110 presentations at National/International Conferences, including invited lectures.
- Member of the Italian Chemical Society
- Member of the American Chemical Society
- **2018**: National Habilitation as Full Professor in “Organic Chemistry” (SSD CHIM/06) and in “Chemical Foundations of Technologies” (SSD CHIM/07)
- **2017**: Grant awarded by MIUR in the frame of “Finanziamento Annuale Individuale delle Attività Base di Ricerca (FFABR 2017)”
- **2016-present**: Member of the Academic Board for Biotechnology PhD School
- Co-Scientific Responsible for the Interuniversity Cooperative Agreement between Università degli Studi di Perugia and The Hebrew University of Jerusalem dal 22-03-**2016-present**)
- **2013-present**: Scientific Responsible for Memorandum of Understanding for Collaboration on Education and Research with the Department of Chemical and Biomolecular Engineering, Sogang University (KR)
- Scientific responsible for: (1) Collaboration Agreement with University of Malta, University of Rome Sapienza, Studio Restauri Formica s.r.l. (<http://www.restauriformica.it/>); (2)

Research Contract with SIMEG s.r.l. (<http://www.simegmarmi.com/>), STEDIL s.r.l. (<http://www.stedilsrl.com/>), CBC Conservazione Beni Culturali.

Recent selected publications

1. Valentini, F.; Marrocchi, A.; Vaccaro, L. "Liquid Organic Hydrogen Carriers (LOHCs) as H-Source for Bio-Derived Fuels and Additives Production", *Adv Energy Mater*, **2022**, 12, 2103362; doi: 10.1002/aenm.202103362
2. Marrocchi, A. (Ed) "Sustainable strategies in organic electronics". *Woodhead Publishing Series in Electronic and Optical Materials. Elsevier*, **2022**, ISBN: 9780128231470 (paperback); doi:10.1016/C2019-0-05518-5
3. Lee, Y.; Ho, D.; Valentini, F.; Marrocchi, A.; Vaccaro, L.; Kim, C. "Improving Charge Transport Performance of Solution-Processed Organic Field-Effect Transistors Using Green Solvent Additives", *J Mater Chem C* **2021**, 9, 16506-16515; doi: /10.1039/D1TC03782J
4. Seri, M.; Marrocchi, A. "The carbon-carbon triple bond as a tool to design organic semiconductors for photovoltaic applications: an assessment of prospects and challenges." *J Mater Chem C, Theme Collection "Special issue in honour of Kees Hummelen and Theme collection "JMCC Hot Paper 2021"*, **2021**, 9, 16164-16186; doi: 10.1039/D1TC02958D
5. Valentini, F.; Ferlin, F.; Lilli, S.; Marrocchi, A.; Liu, P.; Gu, Y.; Vaccaro, L. "Valorisation of urban waste to access low-cost heterogeneous palladium catalyst for cross-coupling reactions in biomass-derived γ -valerolactone." *Green Chem.*, **2021**, 23, 5887-5895; doi: /10.1039/D1GC01707A
6. Ho, D.; Park, S.; Park, Y.; Cho, K.; Campana, F.; Lanari, D.; Facchetti, A.; Seo, S.Y.; Kim, C.; Marrocchi, A.; Vaccaro, L. "Green solvents for organic thin-film transistor processing" *J. Mater. Chem. C*, 2020, 8, 5786-5794; 10.1039/D0TC00512F
7. Valentini, F.; Mahmoudi, H.; Bivona, L.A.; Piermatti, O.; Bagherzadeh, M.; Aprile, C.; Marrocchi, A.; Vaccaro, L. "Polymer-supported bis-1,2,4-triazolium ionic tag framework for an efficient Pd(0) catalytic system in biomass-derived GVL", *ACS Sustainable Chem. Eng.* 2019, 7, 6939-6946; doi: 10.1021/acssuschemeng.8b06502
8. Marrocchi, A.; Trombettoni, V.; Sciosci, D.; Campana, F.; Vaccaro, L. "Key trends in sustainable approaches to the synthesis of semiconducting polymers" in: *Handbook of Organic Materials for Electronic and Photonic Devices*, Ostroverkhova, O. (Ed), 2nd Edition, Woodhead Publishing, 2019; ISBN: 9780081022849
9. Trombettoni, V., Sciosci, D.; Bracciale, M.P.; Campana, F.; Santarelli, M.L.; Marrocchi, A.; Vaccaro, L. "Boosting biomass valorisation. Synergistic design of continuous flow reactors and water-tolerant polystyrene acid catalysts for a non-stopping production of esters." *Green Chem.* 2018, 20, 3149-3396; doi: 10.1039/C8GC00824H
10. Santoro, S.; Ballerini, E.; Marrocchi, A.; Piermatti, O.; Vaccaro, L. "Green reaction media for cross-coupling reactions. A recent overview and possible directions". In: *Advanced Green Chem. 2018 World Scientific Publishing*, pp. 177-204; ISBN: 978-981-3228-10-8 (hardcover); ISBN: 978-981-3228-12-2 (ebook)
11. Marrocchi, A.; Facchetti, A.; Lanari, D.; Petrucci, C.; Vaccaro, L. "Current methodologies for a sustainable approach to pi-conjugated semiconductors" *Energy Environ. Sci.* 2016, 9, 763-786; doi: 10.1039/C5EE03727A
12. Marrocchi, A.; Adriaenssens, P.; Bartollini, E.; Barkakaty, B.; Carleer, R.; Chen, J.; Hensley, D.K.; Petrucci, C.; Tassi, M.; Vaccaro, L. "Novel cross-linked polystyrenes with large space network as tailor-made catalyst supports for sustainable media" *Eur. Pol. J.* 2015, 73, 391-401.
13. Strappaveccia, G.; Luciani, L.; Bartollini, E.; Marrocchi, A.; Pizzo, F.; Vaccaro, L. " γ -Valerolactone as an alternative biomass-derived medium for a greener Sonogashira Reaction" *Green Chem.* 2015, 17, 1071-1076
14. Strappaveccia, G.; Petrucci, C.; Lanari, D.; Ismalaj, E.; Marrocchi, A.; Drees, M.; Facchetti, A.; Vaccaro, L. "Biomass-derived safer medium to replace toxic dipolar solvents and access cleaner Heck coupling" *Green Chem.* 2015, 17, 365-372
15. Presciutti, A.; Asdrubali, F.; Marrocchi, A.; Broggi, A.; Pizzoli, G.; Damiani, A. "Sun simulators: development of an innovative low-cost film-filter" *Sustainability* 2014, 6, 6830-6846