

Giampaolo Lacarbonara

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Date and place of birth 30/12/1994, Noci (Ba), Italy

Sex Male

Nationality Italian

Address Via P. Biancofiore 1/8, 74015, Martina Franca (TA), Italy

Current position, education and professional experience

09-14/11/2020 “Aldo Armigliati” SEM School 2020

01/11/2019- to date **PhD in Nanoscience for Medicine and Environment**

Department of Chemistry “Giacomo Ciamician” – LEME “Laboratory of Electrochemistry of Materials for Energetics”

University of Bologna

Supervisor: Prof. Catia Arbizzani

Research activity: Study of materials and interphases for electrochemical storage of energy from renewable sources.

05/10/2017-18/10/2019 **MSc in Photochemistry and molecular materials**

Department of Chemistry “Giacomo Ciamician” – CLAN “Center for Light Activated Nanostructures” CNR ISOF Bologna

University of Bologna

Topic: “Photoactive rotaxane as on/off switching of mechanical planar chirality”

Supervisor: Prof. A. Credi, Dr M. Baroncini

Expected final mark: 110/110 cum laude

Research activity: Synthesis and characterization of a [2] rotaxane, based on crown ether-ammonium recognition, that comprises a C_s -symmetric macrocycle and azobenzene units. Such a system exhibits a photoactivated mechanical planar chirality with the possibility to control the ratio between the enantiomeric species generated upon photoirradiation with polarized light.

21/09/2013-09/03/2017 **BSc in Chemistry and material chemistry**

Department of Chemistry “Giacomo Ciamician”

University of Bologna

Topic: “Synthesis and characterization of fluorophores-radicals system in nanostructured host”

Supervisors: Prof.ssa N. Zaccheroni, Dr D. Genovese

Final mark: 107/110

Research activity: Design, synthesis, and characterization of organized nanostructured systems in which energy transfer between radicals and organic fluorescent molecules quench the luminescence.

Presentation at conferences

31/08-04/09/2020 **Poster presentation in 71st International Society of Electrochemistry annual meeting**

“Belgrade Online” G. Lacarbonara, M. Rahmanipour, J. Belcari, L. Lodi, A. Zucchelli, C. Arbizzani, “Investigation of structural changes in different metal ion battery electrodes by in-situ dilatometry”. M. Rahmanipour, G. Lacarbonara, C. Arbizzani, “Lithium Interphase Enhancement for Lithium-Sulphur Batteries”

24-26/02/2021 **Oral presentation in 1st IWES 2021 workshop**, G. Lacarbonara, J. Belcari, L. Lodi, C.

Arbizzani, “Gas Evolution in Li-ion batteries revealed by Electrochemical In-Situ Dilatometry”.

- 9/03/2021** **Invited speaker at Marposs S.p.a., G. Lacarbonara**, Experimental validation of the In-situ Electrochemical Dilatometer performed in the Laboratory of Electrochemistry of Materials for Energetics
- 11/03/2021** **Oral presentation in Flow Camp Next Generation Flow Battery conference and networking event, G. Lacarbonara**, L. Faggiano, S. Rapino, C. Arbizzani, L. Sanz, C. Ricci, L. Murtomäki, W. Badenhurst, J. Rohan, M. Boaventura, J. Cruz, T. Müller, T. Gerber, R. La Gioia, I. Guedea, A. Alvarez, C. Barbu, “Aqueous copper-based flow batteries for renewables integration and sustainable energy storage”
- 14-23/09/21** **Oral presentation in SCI2021, G. Lacarbonara**, N. Albanelli, L. Faggiano, C. Arbizzani A spectroelectrochemical study of copper chloro-complexes for high performance copper redox flow batteries
- 31/08-04/09/2021** **Poster presentation in 72nd International Society of Electrochemistry annual meeting, G. Lacarbonara**, L. Faggiano, C. Arbizzani, Copper Chloro-Complexes Stability and Dynamics for High Performance Aqueous Redox Flow Batteries.

Teaching activity

Co-supervisor of BSc students in Chemistry and Biochemistry Engineering:

- 07/2020** *Alessia Franceschini* “Carbonaceous materials from bio-waste as anodic material in Na-ion batteries”.
- 12/2021** *Sebastiano Chini* “Graphitic carbon from CO₂ for sustainable Li ion battery anodes”
- 03/2022** *Giulia Nicoletti* “New separators for advanced Lithium-based batteries”

Co-supervisor of MSc student in Chemistry:

- 10/2021** *Nicolò Albanelli* “Spectroelectrochemical characterization of copper chloride complexes formed in electrolytical solutions used in redox flow batteries”

Outreach activity

- 21-22/11/2018** **Molecular machines days - “From laboratory curiosities to the Nobel Prize. The journey of nanomachines”**

During this outreach event carried out at the department of chemistry “Giacomo Ciamician” (Bologna, IT), I participated and contributed to the organization of the overall event, took care of filming, security, promotion of the event and presentation of the three 2016 Nobel laureate Prof. Sir Fraser Stoddart, Prof. Ben Feringa and Prof. Jean Pierre Sauvage.

Publications

G. Lacarbonara, M. Rahmanipour, J. Belcari, L. Lodi, A. Zucchelli, C. Arbizzani, “Dilatometric analysis: a powerful tool for testing and improving cell performance”, *Electrochemical Acta* 375 (2021) 137938. <https://doi.org/10.1016/j.electacta.2021.137938>

G. Lacarbonara, L. Faggiano, S. Porcu, P. C. Ricci, S. Rapino, D. P. Casey, J. F. Rohan, C. Arbizzani, Copper chloro-complexes concentrated solutions: an electrochemical study, *Batteries*, 7 (2021) 83. <https://doi.org/10.3390/batteries7040083>

L. Faggiano, G. Lacarbonara, W. D. Badenhurst, L. Murtomäki, L. Sanz, C. Arbizzani, Short thermal treatments of carbon felts for copper-based redox flow batteries, *Journal of Power Sources*, 520 (2022) 230846. <https://doi.org/10.1016/j.jpowsour.2021.230846>

Chapter 5. Other important inorganic chemistries In *Redox Flow Batteries*, Roth, Noack, Skyllas-Kazacos (Eds.), Wiley-VCH GmbH in press

C. Arbizzani, G. Lacarbonara, S. Chini, S. Ratso, I. Kruusenberg, Graphitic carbon from CO₂ for sustainable Li ion battery anodes, Manuscript to be submitted to *Carbon*

G. Lacarbonara, N. Albanelli, L. Faggiano, C. Arbizzani, A spectroelectrochemical study of copper chloro-complexes for high performance copper redox flow batteries, Manuscript in preparation.

Personal skills

Job-related skills

Electrochemistry (voltametric techniques, impedance spectroscopy, galvanostatic techniques, spectroelectrochemistry, rotating disk electrode);

NMR spectroscopy (^1H , ^{13}C , ^{19}F , COSY, HSQC, HMBC, NOESY);

Photophysics (UV-vis spectroscopy, Time Correlated Single Photon Counting (TCSPC), fluorescence anisotropy, circular dichroism spectroscopy);

Porosimetry and Calorimetry (DSC, TGA).

Electron Microscopy (FIB, SEM, TEM, in-situ TEM)

Software skills

Microsoft Office tools, Linux (basic); ChemBioDraw; Origin and SigmaPlot; MestReNova (NMR data processing and analysis); EClab (electrochemistry); basic knowledge of programming languages (C, C++, php), basic knowledge of HTML markup language and database (MySQL).