

# CURRICULUM VITAE OF GABRIEL NEGRÃO MELONI

## EDUCATION

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**2012- Nov. 2017:** PhD, Chemistry, University of São Paulo

**2007-2012:** BSc, Chemistry, University of São Paulo

## APOINTMENTS

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**Aug. 2023** – Assistant Professor in the Chemistry Department at University of São Paulo

**Dec. 2021-** Honorary Research Fellow in the Warwick Electrochemistry and Interfaces Group (Department of Chemistry)

**May 2022 – July 2023:** Research Fellow in the Department of Chemistry at University of São Paulo under a FAPESP fellowship.

**June. 2021- Nov. 2021** - Research Fellow in the Warwick Electrochemistry and Interfaces Group (Department of Chemistry). *Supervisor: Patrick Unwin*

**2020 – May. 2021:** Research Fellow in the Warwick Electrochemistry and Interfaces Group (Department of Chemistry) and Soyer Research Group (School of life Sciences)– *Supervisor: Patrick Unwin and Orkun Soyer*

**2018 – May 2021:** Member of the Bio Electrical Engineering Innovation Hub (BeeHub) at the University of Warwick.

**2018-2020:** Research Fellow in the Warwick Electrochemistry and Interfaces Group (Department of Chemistry) at the University of Warwick under a Marie Skłodowska-Curie Fellowship (Europe Union) – *Supervisor: Patrick Unwin*

**2015-2016:** *Visiting PhD student, University of Warwick under a Science without borders fellowship - Supervisor: Patrick Unwin*

## RESEARCH INTEREST

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Development and application of new electrochemical techniques and electrodes for investigating chemical processes in living systems at the nanoscale level. Development of new tools for investigating biochemical phenomena and abiotic systems. Investigate the electrical interface between living systems (cells). Development and fabrication of low cost and accessible electrochemical instrumentation for teaching, research and democratization of science. Has more than 40 publications (1300 citations), including 2 single author papers, and an h-index of 18

## SELECTED PUBLICATIONS

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- The Current Shortcomings and Future Possibilities of 3D Printed Electrodes. *Analytical Chemistry*. **2024**, 96 (36), 14315-14319

- Elucidation of alkaline electrolyte-surface interaction in SECCM using a pH-independent redox probe, *Electrochimica Acta*. **2023**, 460

- 3D printed electrodes design and voltammetric response. *Electrochimica Acta*. **2023**, 449

- Optical Super-Localisation of Single Nanoparticle Nucleation and Growth in Nanodroplets. *ChemElectroChem*. **2023**, 10, e202201162

-Nanoscale Visualization of Electrochemical Activity at Indium Tin Oxide Electrodes. *Analytical Chemistry*. **2022**, 94 (11), 4729-4736

-Probing and Visualizing Interfacial Charge at Surfaces in Aqueous Solution. *Annual Review of Analytical Chemistry*. **2022**, 15:1

- Adiabatic versus Non-Adiabatic Electron Transfer at 2D Electrode Materials. *Nat. Commun*. **2021**, 12 (1), 7110.

- Hybrid Scanning Electrochemical Cell Microscopy-Interference Reflection Microscopy (SECCM-IRM): Tracking Phase Formation on Surfaces in Small Volumes. *Faraday Discuss*. **2021**, 34 (4), 240–241.

- Unveiling the Contribution of the Reproductive System of Individual *Caenorhabditis Elegans* on Oxygen Consumption by Single-Point Scanning Electrochemical Microscopy Measurements. *Anal. Chim. Acta* **2021**, 1146, 88–97.

- A Scientist ' s Guide to Buying a 3D Printer: How to Choose the Right Printer for Your Laboratory. *Anal. Chem*. **2020**. 92 (22), 14853–14860.

- Bioelectrical understanding and engineering of cell biology. *J. R. Soc. Interface* **2020**, 17 (166), 202000132.

- Nanoscale Electrochemical Mapping, *Anal. Chem*. **2018**, 91 (1), 84-108.

- 3D printed and Microcontrolled: The one hundred dollars Scanning Electrochemical Microscope, *Anal. Chem*. **2017**, 89 (17), 8643-8649.

- Building a Microcontroller Based Potentiostat: A Inexpensive and Versatile Platform for Teaching Electrochemistry and Instrumentation, *J. Chem. Educ*. **2016**, 93 (7), 1320–1322.

## INVITED TALKS

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- **Oct. 2020** – **University of Arkansas** – Chemistry department analytical chemistry seminars
- **Nov. 2019** – **University of Cincinnati** – Chemistry department, Departmental seminars

29 September 2024

### Motivation statement – Chair of ISE Division 1

It would be my honour to serve to the analytical electrochemistry community as the chair of the ISE Division 1. I have been working with analytical electrochemistry since my first undergraduate research project in Brazil and have been passionate about the subject ever since. Analytical electrochemistry is a fascinating subject that bridges the fundamental understandings of physical chemistry to the “real world” applications of analytical chemistry. It has fascinated humanity much before Michael Faraday’s and Humphry Davi’s work and keeps on doing so today. From applications that directly improve human life, to the research on new energy storage and conversion materials that will help the fight on climate change, analytical electrochemistry techniques and fundamentals are present, shaping cutting-edge research in many fields. The importance of the field is reflected on the size of our Division at ISE, and on the interdisciplinary aspect of the research presented in the many symposia we sponsor and organise through the years. This multidisciplinary aspect permeates my own research, influenced by my own participations on ISE meetings, particularly the 2017 in Providence, when Prof. Lane Baker kindly suggested I submitted a presentation for the symposia he was organising.

During my career I have had the opportunity to be supervised by great mentors which are reference in their own field within analytical electrochemistry. From my PhD supervisor in Brazil, Prof. Mauro Bertotti, to Prof. Salvatore Daniele, with whom I took a secondment during my undergrad learning SECM and to my former Postdoc advisor, Prof. Patrick Unwin. From their collective expertise I learned to appreciate the applications of analytical electrochemistry, but more importantly, I gained a deep regard to understanding the physical chemical fundamentals behind our research. A view that I share with the many likeminded researchers I have been fortunately to link with through my former supervisors and in special from ISE meetings and sponsored events. This regard for the fundamentals is something I fear that has been forgotten or overseen, as the ever-increasing publications of “electrochemical sensors” fall short on the rigor we expect from such a fundamental research field.

I believe that ISE Division 1 is a venue for teaching and broadcasting the importance of the fundamental knowledge which should be in used in tandem with application. Division 1 is also a stage, where young researchers should be put in the limelight, and giving the opportunity to showcase their work. ISE has giving me this opportunity in the past and it was career changing. Division 1 can also help to promote more representativity, namely, for developing country researchers. Division 1 is a clear choice for me. My work spans from electrochemical instrumentation to theoretical electrochemistry and analytical applications. I am recklessly curious about electrochemistry, that is what drives my research and why Division 1 is compelling to me. Having had the opportunity and privilege to network and collaborate with many researchers from all over the globe, having studied with so many researchers that are now new faculty members, and being a Latin American researcher, I think I am in a good position, and it is time to take a more leading role within the Society. If elected I will propose the Division should organise a symposium on “Electroanalyses: applied fundamentals” and one on “The future of electroanalytical chemistry: student meeting”, like the successful experience SEAC has had in the US, where students and young researchers present data in a format that is very conducive to an open discussion. These could be an annual Division 1 symposium or a sponsored symposium.

I look forward to continuing contributing to the analytical electrochemistry community and would be honoured to serve the community as the chair.

Kind regards,

Gabriel Meloni