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# G. M. Segovia

## Chemistry Degree

CONICET fellow

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### Personal Details

Names Gustavo Manuel  
Last Name Segovia  
Date of Birth March 17, 1993  
Place of Birth Buenos Aires  
Nationality Argentine

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### Current Position

PhD in Chemistry Fellowship **National Scientific and Technical Research Council (CONICET, in Spanish)**, Institute of theoretical and applied Physicochemical research (INIFTA, in Spanish). National University of La Plata (UNLP, in Spanish), Faculty of Exact Sciences, La Plata, Buenos Aires, Argentina.

### PhD Current Work

Title **“Synthesis and Characterization of Nanoparticles formed by Microporous Coordination Polymers for the self-assembly of Electroactive Films with Controlled Micro and Mesoporosity”**  
Advisors Dr. Matias Rafti and Dr. Omar Azzaroni  
Place of Work Soft Matter Laboratory, INIFTA, Diag. 113 and Street 64, (1900) La Plata, Buenos Aires, Argentina.

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### Education

2011–2016 **Chemistry Degree**, National University of La Plata (UNLP), Faculty of Exact Sciences (FCE), La Plata, Buenos Aires, Argentina.

### Degree Thesis

Title **“Synthesis and Characterization of Nanoparticles Functionalized MOFs for self-assembly Films with Controlled Micro and Mesoporosity”**

Advisor: Dr. Matias Rafti, Dr. Omar Azzaroni and Agustín S. Picco

Place of Work: Soft Matter Laboratory, INIFTA, Diag. 113 and Street 64, (1900) La Plata, Buenos Aires, Argentina.

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## Languages

Spanish **Native**

English **Very good**

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## Teaching and Pedagogical Experiences

2015-2018 **University assistant** in the chairs of “Introduction to Chemistry” and “General Chemistry” of the faculty of exact sciences of the National University of La Plata.

The position involves the assistance to university students to solve theoretical and practical problems. In the latter, laboratory experiences related to the subject of the chair are prepared and carried out in order to strengthen the knowledge acquired.

2016- At present **University assistant** in the extension project “The faculty goes to school” of the faculty of exact sciences of the National University of La Plata.

The general objective is to contribute to improve the teaching of Exact and Natural Sciences in primary schools, encouraging experimentation as a way of approaching knowledge. A fundamental aspect of this project is that it works with teachers and not with students, in order to generate a dynamic and horizontal bond between peers with different training. To achieve the objective, different activities are carried out, such as: coordination with the inspectors and managers, joint planning of the topics to be addressed and workshops related to the school curriculum focused on the use of laboratory material.

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## Scientific Background

### Articles

2017 **Metal-organic frameworks meet polymer brushes: enhanced crystalline film growth induced by macromolecular primers.** *Materials Chemistry Frontiers*, 2017, vol. 1, no 11, p. 2256-2260. Rafti, M., Allegretto, J. A., Segovia, G. M., Tuninetti, J. S., Giussi, J. M., Bindini, E., and Azzaroni, O.

2018 **Cysteamine-modified ZIF-8 colloidal building blocks: Direct assembly of nanoparticulate MOF films on gold surfaces via thiol chemistry.** *Materials Today Chemistry*, 2018, vol. 8, p. 29-35. Segovia, G. M., Tuninetti, J. S., Moya, S., Picco, A. S., Ceolín, M. R., Azzaroni, O., and Rafti, M.

2019 **Layer-by-layer integration of conducting polymers and metal organic frameworks onto electrode surfaces: enhancement of the oxygen reduction reaction through electrocatalytic nanoarchitectonics.** *Molecular Systems Design & Engineering*, 2019, vol. 4, p. 893-900. Ana Paula Mártire, Gustavo M. Segovia, Omar Azzaroni, Matías Rafti, and Waldemar Marmisollé.

2020 **Self-assembly of ZIF-8 MOF thin films with hierarchical porosity: a top-down approach from colloidal units.** Gustavo M. Segovia, Jimena S. Tuninetti, Omar Azzaroni, and Matías Rafti. (In submission process)

2020 **Competitive modulation of ligands exposing thiol moieties on formation and growth of ZIF-8: design of building blocks to assembly films.** Gustavo M. Segovia, Juan A. Allegretto, Jimena S. Tuninetti, Agustín S. Picco, Marcelo R. Ceolín, Elisa Bindini, Matías Rafti, Omar Azzaroni. (In writing process)

### National and International Conferences

- 2016 **26<sup>a</sup> Edición de la Reunión Anual de Usuarios del Laboratorio Nacional de Luz Síncrotron (LNLS) (RAU, in Spanish)**, LNLS, CNPEM, Campinas, Sao Paulo, Brasil. From August 24<sup>th</sup> to August 25<sup>th</sup>, 2016, Poster: “SAXS/WAXS Study of the Kinetics of Formation of Metal-Organic Frameworks” Segovia G. M.<sup>1</sup>, Picco A.<sup>2</sup>, Tuninetti J. S.<sup>1</sup>, Ceolín M.<sup>1</sup>, Azzaroni O.<sup>1</sup>, Rafti M.<sup>1</sup> 1 INIFTA, CONICET-UNLP, Argentina; 2 LNLS, CNPEM, Campinas, Brazil.
- 2016 **XXXI Congreso Argentino de Química (AQA, in Spanish)**, Capital Federal, Buenos Aires, Argentina. From October 25<sup>th</sup> to October 28<sup>th</sup>, 2016, Poster: “Synthesis and Characterization of Functionalized MOFs Nanoparticles” Segovia G. M.<sup>1</sup>, Picco A.<sup>2</sup>, Azzaroni O.<sup>1</sup>, Rafti M.<sup>1</sup> 1 INIFTA, CONICET-UNLP, Argentina; 2 LNLS, CNPEM, Campinas, Brazil.
- 2016 **5<sup>o</sup> Meeting Self-Assembly Structures in Solutions and at Interfaces (AUTOORG 2016)**, Florianópolis, Santa Catarina, Brazil. From November 2<sup>nd</sup> to November 4<sup>th</sup>, 2016, Poster: “Formation Kinetics of Bimetallic Metal Organic Frameworks and its Potential Applications as Surface Modifying Agents For Synthesis of Electroactive Films” Segovia G. M.<sup>1</sup>, Picco A.<sup>2</sup>, Tuninetti J. S.<sup>1</sup>, Ceolín M.<sup>1</sup>, Azzaroni O.<sup>1</sup>, Rafti M.<sup>1</sup> 1 INIFTA, CONICET-UNLP, Argentina; 2 LNLS, CNPEM, Campinas, Brazil.
- 2018 **1<sup>o</sup> TYAN International Thematic Workshop “Fundamentals of Photoelectrochemistry: From Materials Science to Energy Conversion”**, INTECH, Chascomús, Buenos Aires, Argentina. From 23 to 27 of April, 2018.
- 2018 **São Paulo School of Advanced Science on Colloids**, Campinas, São Paulo, Brazil. From October 28<sup>th</sup> to November 7<sup>th</sup>, 2018, Poster: “Synthesis and characterization of functionalized MOFs nanoparticles. Self-assembly of films on electroactive substrate” Gustavo M. Segovia<sup>1</sup>, Agustín S. Picco<sup>1</sup>, Jimena S. Tuninetti<sup>1</sup>, Omar Azzaroni<sup>1</sup>, Matías Rafti<sup>1</sup> 1 INIFTA, CONICET-UNLP, Argentina.
- 2018 **6<sup>o</sup> Meeting Self-Assembly Structures in Solutions and at Interfaces (AUTOORG 2018)**, São Pedro, São Paulo, Brazil. From November 7<sup>th</sup> to November 10<sup>th</sup>, 2018, Poster: “Self-assembly of films on electroactive substrate with controlled micro and mesoporosity” Gustavo M. Segovia<sup>1</sup>, Jimena S. Tuninetti<sup>1</sup>, Omar Azzaroni<sup>1</sup>, Matías Rafti<sup>1</sup> 1 INIFTA, CONICET-UNLP, Argentina.
- 2020 **9<sup>o</sup> Virtual Nanotechnology Poster Conference (NANOPOSTER 2020)**, International NanoScience Community. From April 20<sup>th</sup> to April 26<sup>th</sup>, 2020, Poster: “Self-assembly of films Nanoparticulated MOFs on Gold Surfaces via

Thiol Chemistry: Cysteamine coated ZIF-8 Colloidal Building Blocks” Gustavo M. Segovia<sup>1</sup>, Jimena S. Tuninetti<sup>1</sup>, S. E. Moya<sup>1</sup>, Agustín S. Picco<sup>1</sup>, Marcelo Ceolín<sup>1</sup>, Omar Azzaroni<sup>1</sup>, and Matías Rafti<sup>1</sup> 1 INIFTA, CONICET-UNLP, Argentina.

## Scientific Visits

- November/  
December 2016      **Mateus Cardoso Research Group**, CNPEM, Campinas, Sao Paulo, Brazil.  
Advisor: Agustín S. Picco  
Topic: Synthesis and Characterization of Core@Shell ZIF-8@SiO<sub>2</sub> and SiO<sub>2</sub>@ZIF-8 nanoparticles.
- April/  
September 2017      **Soft Matter Nanotechnology Research Group**, CIC biomaGUNE, San Sebastian, País Vasco, España. Advisor: Sergio E. Moya.  
Topic: Synthesis and Characterization of systems composed of Metal-Organic Frameworks.
- April/July 2018      **Soft Matter Nanotechnology Research Group**, CIC biomaGUNE, San Sebastian, País Vasco, España. Advisor: Sergio E. Moya.  
Topic: Self Assembly of Microporous Coordination Polymers Films with Controlled Mesoporosity.

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## Fellowships

- April 2016 – At Present      CONICET – PhD fellow
- September 2015 – March 2016      National Inter-University Council (CIN, in Spanish) – Stimulus Fellowship to scientific vocations 2015 (EVC 2015, in Spanish)  
Theme Title: “Macromolecular Design of Functional Surfaces Using Polymeric Monolayers”.  
Advisors: Dr. Omar Azzaroni and Jimena S. Tuninetti  
Place of Work: Soft Matter Laboratory, INIFTA, Diag. 113 and Street 64, (1900) La Plata, Buenos Aires, Argentina.

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## Professional Experience

### Abstract:

Dynamic light scattering (DLS): Used in the characterization of size, polydispersity, and interactions between colloidal particles.

Fourier transform infrared spectroscopy - Mode Attenuated Total Reflectance (ATR-FTIR): Used in the characterization of chemical functional groups present on the surface of nanoparticles.

UV-visible Spectroscopy: Used in the study of ligand exchange in metal-organic frameworks.

Cyclic Voltammetry: Used in the evaluation of functional properties of microporous films.

Spectroscopy Ellipsometry: Used in the characterization of microporous films thickness.

X rays Photoelectron Spectroscopy: Used in the elemental analysis of metal-organic frameworks nanoparticles surface.

Scanning Electron Microscopy: Used in the study of the size and morphology of metal-organic frameworks nanoparticles.

Atomic Force Microscopy: Used in the characterization of metal-organic frameworks films.

In the course of my professional training in the academic-scientific field, I have developed skills such as theoretical training in the field of my specialty, acquisition of skills to conduct research, development of experimental skills, access to specialized sources of information and border literature.

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## Awards and distinctions

"Egresado Distinguido 2016" award. Distinction granted by the National University of La Plata to the graduate with the best average of each university career.

"Joaquín V. González 2016" award. Distinction granted by the Municipality of La Plata to the 10 graduates with the best averages of each faculty of the National University of La Plata.