107 Scottsville Rd.
Rochester, 14611
(+1) 585 789 9519
smontill@ur.rochester.edu
Google Scholar

Sebastián Montillo Vega

Education

2022–Pres. **PhD. in Chemistry**,
University of Rochester, Rochester, NY,
Advisor: Prof. Pengfei (Frank) Huo,
Research Focus: Vibrational Strong Coupling, Polaritonic chemistry.

2022–2023 **MSc. in Chemistry**,
University of Rochester, Rochester, NY,
Advisor: Prof. Pengfei (Frank) Huo.

2014–2021 **BSc. in Chemistry**,
University of Antioquia, Medellín, Colombia,
Advisor: Albeiro Restrepo.

Research Experience

2022–Pres. **Graduate Research**, University of Rochester,
Quantum dynamics and Polaritonic chemistry.

- Development of rate theories and exact quantum mechanical simulations to understand how photons can modify chemical reactivity.
- Development of new theoretical frameworks to understand light - matter coupling in optical cavities.

Technical Skills: C++ programming, Blender, Quantum Expresso, Machine Learning.

2018–2021 **Undergraduate Research**, University of Antioquia.

- Molecular interactions and insertion of ibuprofen in a lipid bilayer in aqueous environment.

Computational Chemsitry: Molecular dynamics - Advisor: Albeiro Restrepo.

- Characterization of gold - copper surfaces for hydrogen production catalysis.

Computational Chemsitry: Electronic structure - Advisor: Carlos Cárdenas.

- Glycerol valorization towards the production of lactic acid using nanostructured catalysts.

Computational Chemsitry: Electronic structure - Advisor: Dianan lópez.

Technical Skills: Python programming, LaTeX, Gaussian and VASP simulations, linux.

Publications

Theoretical insights into the Resonant Suppression Effect in Vibrational Polariton Chemistry,
S. Montillo, *W. Ying and P. Huo*,
Submitted to *Nature Communications*,
University of Rochester.

Polarized Fock States and the Dynamical Casimir Effect in Molecular Cavity Quantum Electrodynamics,
A. Mandal, ***S. Montillo*** *and P. Huo*,
J. Phys. Chem. Lett. 11, 9215 (2020),
University of Rochester.

Evolution of Bonding during the Insertion of Anionic Ibuprofen into Model Cell Membranes,
N. Rojas-Valencia, S. Gómez, ***S. Montillo****, M. Manrique-Moreno, C. Cappelli, C. Hadad, and A. Restrepo*,
J. Phys. Chem. B 2020, 124, 1, 79–90,
University of Antioquia.

Fellowships and awards

2024 **Esther M. Conwell Fellowship**, *University of Rochester*.

2021 **Highest GPA**, *University of Antioquia*.

2018 - 2020 **Young Researcher Award**, *University of Antioquia*.

2019 **i-Scholar summer research program**, *University of Rochester*.

2019 **VII Summer School**, *University of Chile*.

Posters And Oral Presentations

Jun. 2024 **American Conference on Theoretical Chemistry (ACTC) 2024**, *University of North Carolina*, *"Theory of Resonant Suppression in Vibrational Polariton Chemistry"*.

Aug. 2019 **Computer simulations of biological membranes conference**, *Los Andes University*, *"Insertion of Ibuprofen into lipid bilayers"*.

Oct. 2019 **National Meeting of Theoretical and Computational Chemist**, *La Costa University*, *"Glycerol valorization towards the production of lactic acid using nanostructured catalysts"*.

Outreach and Leadership

2025–Pres. **Diversity Equity and Inclusion Committee**, *University of Rochester*,
Leader of the Transitioning Rochester Advisory Committee (TRAC), dedicated to supporting incoming students, with a particular focus on assisting international students.

2023–2024. **Diversity Equity and Inclusion Committee**, *University of Rochester*,
Member of the Transitioning Rochester Advisory Committee (TRAC), dedicated to supporting incoming students, with a particular focus on assisting international students.

2022–2024. **Association of Latin American students (ALAS)**, *University of Rochester*,
Vice President. Managed the association's budget and served as its representative in the graduate student association. Oversaw recruitment efforts and worked to increase the association's visibility across the University.

2023–Pres. **Student Mentoring**, *University of Rochester*,
- Mentored the first year graduate students *Parker Sornberger* and *Alejandro Mantilla* by providing guidance of course selection, research lab and literature sources,
- Mentored the first year graduate student *Jonathan Soderquist* in a research project by providing explanations on key concepts of polariton chemistry, quantum dynamics and open quantum systems as well as guidance on simulation code.

2023–2024. **National Chemistry Week , School #8** , *University of Rochester*,
Performed hands-on experiments to bring science to kids.

2022–2024 **Upperbound science outreach**, *University of Rochester*,
Science talks and hands-on simulations with high school students.

Teaching Experience

Spring 2025. **Computational Chemistry (CHEM 468)**, *University of Rochester*,
Teaching Assistant,
Responsible for office hours, computational workshops and grading of homework assignments.

Fall 2023. **Physical Chemistry I (CHEM 251)**, *University of Rochester*,
Teaching Assistant,
Responsible for office hours and grading of homework assignments and exams .

Spring 2023. **Chemical Concepts, Systems, and Practices II (CHEM 132)**, *University of Rochester*,
Teaching Assistant,
In charge of coordinating the different teaching assistants for the grading of homework assignments.

Fall 2022. **Physical Chemistry I (CHEM 251)**, *University of Rochester*,
Teaching Assistant,
Responsible for office hours and grading of homework assignments and exams.