

# ACHYUT RANJAN GOGOI

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PhD Candidate in Chemistry (Computational Organic & Iron Catalysis)

Texas A&M University | Anticipated Graduation: May 2026

Email: [achyutrgogoi@tamu.edu](mailto:achyutrgogoi@tamu.edu) | [achyutrgogoi@ucla.edu](mailto:achyutrgogoi@ucla.edu) | Phone: +1 979-402-9543

Website: <https://achyutrgogoi.github.io> | [LinkedIn](#) | [Google Scholar](#)

## SUMMARY

Ph.D. candidate in Chemistry with **4+** of experience teaching and mentoring students in general, organic, and computational chemistry. Strong ability to explain complex topics, such as computational chemistry, organic synthesis, spectroscopy, and reaction mechanisms, in clear and accessible ways that support student learning. Research focuses on developing sustainable iron-catalyzed transformations and elucidating reaction mechanisms through computational and experimental approaches. Authored **18** peer-reviewed publications and collaborated with research groups across **10+** universities. Demonstrated commitment to student success through mentoring undergraduate and community-college researchers and leading multi-campus outreach programs that broaden access for underrepresented community college students to scientific training and STEM research opportunities.

## TEACHING AND MENTORING EXPERIENCE

### ❖ Coordinator – Computational Chemistry Outreach Program (2022-Present)

- ✓ Co-led *iCarbon* initiative, delivering weekly computational chemistry classes that increased equity in STEM by expanding research opportunities for underrepresented community college students.
- ✓ Designed and taught weekly virtual courses on DFT & molecular modeling while leading a team of 6 graduate mentors, delivering high-impact computational training to **15** undergraduates at Sacramento City College & Long Beach City College, strengthening their pathway into STEM research.

### ❖ Graduate Mentor (2022-Present)

- ✓ Supervised and mentored **6 trainees** (undergraduate & graduate) in independent computational and experimental research projects, encompassing organic synthesis, computational chemistry (DFT/MD), mechanistic analysis, and spectroscopy.

### ❖ Graduate Teaching Assistant (2021-2023)

- ✓ Delivered instruction & hands-on supervision in OChem labs, guiding students through synthesis, purification & spectroscopic techniques while reinforcing best practices in laboratory safety.

## RESEARCH EXPERIENCE

### ❖ Visiting Graduate Researcher (June'2025- Present)

Project Title: **Development of Iron Catalyzed Asymmetric Reductive Cross Electrophile Coupling using High Throughput Experimentation (HTE) and DFT**

Supervisor: Prof. Osvaldo Gutierrez, University of California, Los Angeles

- ✓ Leading the development of iron-catalyzed asymmetric reductive cross-electrophile coupling reactions through high-throughput experimentation and data-driven reaction design.

### ❖ PhD Research (August'2021-Present)

Project 1 Title: **Mechanistic Insight Guided Rational Design of Iron-Catalyzed Asymmetric Multicomponent Cross-Coupling Strategies**

Supervisor: Prof. Osvaldo Gutierrez, Texas A&M University

- ✓ Developed **asymmetric** multicomponent iron-catalyzed cross-coupling strategies for the **enantioselective synthesis** of chiral boronic esters (**>98% e.e.**); elucidated detailed mechanistic pathways through integrated **DFT** modeling and **Mössbauer spectroscopic** analysis.

## Project 2 Title: **Harnessing the Symbiotic Potential of Computation & Experiment in Elucidation of Reaction Mechanisms**

Supervisor: Prof. Osvaldo Gutierrez, Texas A&M University

- ✓ Collaborated with groups across the globe, including the [Martin group](#) (ICIQ), [Fleming group](#) (Drexel), [Scheidt group](#) (Northwestern), [Thomas](#) and [Powers](#) groups (Texas A&M), [Levin group](#) (Chicago), and [Wickens group](#) (Wisconsin-Madison) etc. utilizing advanced tools (**DFT & Molecular Dynamics**) to investigate mechanisms across iron, nickel, and rhodium and metal-free catalytic transformations leading to **18+** high impact publications & more under review.

### ❖ **Visiting Researcher (September'2023- November'2023)**

Project Title: **"Mössbauer Study on Iron-Catalyzed Asymmetric Multicomponent Cross-Coupling Strategies"**

Supervisor: Prof. Michael Neidig, University of Oxford, United Kingdom

- ✓ Conducted in-depth **Mössbauer spectroscopy** experiments to identify & characterize the active stereodetermining iron species, contributing to a deeper understanding of reaction mechanisms for the development of more effective iron based catalytic strategies.

## **LEADERSHIP & SERVICE**

- Recipient of the **Sharon Dabney Memorial Scholarship** for excellence in research and departmental leadership at Texas A&M University.
- **Secretary** at Phi Lambda Upsilon: The Honorary Chemical Society of Texas A&M University, 2024.
- Physical Chemistry Division Representative at Chemistry Student Safety Committee (CSSC) Board 2024.
- Graduate Student Member: American Chemical Society, 2024.

## **PROFESSIONAL MEMBERSHIP**

ACS Member | CIC (Catalysis Innovation Consortium) Student Ambassador | Recruitment & Open House Team Member in Texas A&M University Chemistry Department.

## **CORE SKILLS**

Curriculum Design | Creating problem sets & rubrics | Student mentoring & evaluation

★★★★★  
5.0

Computational Chemistry (DFT & MD) | Cross-functional Collaboration

★★★★★  
5.0

Organic Synthesis: Asymmetric Catalysis | Mössbauer Spectroscopy | HTE | Coding (C++, Python)

★★★★★  
4.5

## **TECHNICAL SKILLS**

Instruments: Mössbauer Spectrometer, NMR, RI-NMR, FT-IR, UV-Vis, Spectrofluorometer, Polarimeter

Software: Gaussian, ORCA, GAMESS, Avogadro, AutoCAD, PyMol

Programming: Python, C++, Arduino, FORTRAN, MySQL

## **EDUCATION**

PhD Chemistry, Texas A&M University (2021–Present) – GPA: 3.75

M.Sc. Chemistry, IIT Bombay (2021) – CPI: 9.69 | B.Sc. Chemistry, University of Delhi (2019) – CPI: 9.59

## **SELECTED TALKS & PRESENTATIONS**

Delivered more than 10 scientific talks aimed at diverse audiences, translating complex mechanisms and computational models into accessible visuals for students and faculty.

- SACNAS Diversity in Science Symposium 2023 – Poster Award (**3rd Place**)
- ACS-Division of Organic Chemistry Graduate Research Symposium 2025, San Diego – Oral Presentation titled *"Synergizing Computation and Experiments for Sustainable Reaction Design"*.

- ACS Fall 2024, Denver – Oral Presentation titled “*Mechanistic Insight Guided Rational Design of Iron-Catalyzed Asymmetric Multicomponent Cross-Coupling Strategies*”.
- Gordon Research Conference (Physical Organic Chemistry) 2023 – Poster Presentation titled “*Fe-Catalyzed Asymmetric Multicomponent Cross-Coupling Reactions: Scope and Mechanistic Insights*”.
- Catalysis Innovation Consortium (CIC) System Wide Meeting 2025, Emory University - Virtual oral talk titled “*Synergizing Computation and Experiments for Sustainable Reaction Design*”.
- Theoretical and Physical Organic Chemistry (TPOC) Monthly Meeting 2023, University of Houston and UC Davis - Virtual oral talk titled “*Harnessing the symbiotic potential of computation and experiment for sustainable iron catalysis*”.
- Catalysis Innovation Consortium (CIC) Annual Meeting 2024, Emory University - Poster titled “*Mechanistic Insight Guided Rational Design of Iron-Catalyzed Asymmetric Multicomponent Cross-Coupling Strategies*”.
- Welch Conference 2024, Houston - Poster titled “*Mechanistic Insight Guided Rational Design of Iron-Catalyzed Asymmetric Multicomponent Cross-Coupling Strategies*”.
- Cotton Medal Conference 2023 and 2024, Texas A&M University - Poster titled “*Mechanistic Insight Guided Rational Design of Iron-Catalyzed Asymmetric Multicomponent Cross-Coupling Strategies*”.
- Houk Research Conference 2022, UCLA - Poster titled “*Computational Investigation into Electron Transfer Events in Polypyridine Ligated Nickel Complexes*”.

## PUBLICATIONS

Co-author of **18** peer-reviewed articles (**2 First author, 8 second author**), including in Nature Catalysis, Nature Communications, JACS, ACS Catalysis, Chem, Angew. Chem., etc. ; 2 more first author manuscripts under preparation.

1. [Gogoi, A. R.](#); Rentería-Gómez, A.; Tan, T.D.; Ng, J. W.; Koh, M. J.; Gutierrez, O. Iron-catalyzed radical difunctionalization of alkenes. *Nat. Synth.* **2025**, *4*, 1036–1055.
2. [Gogoi, A. R.](#); Usman, F. O.; Mixdorf, J. C.; Gutierrez, O.; Nguyen, H. M. Rhodium-catalyzed Asymmetric Synthesis of 1,2-disubstituted Allylic Fluorides. *Angew. Chem. Int. Ed Engl.* **2023**, *62*.
3. Targos, K.; [Gogoi, A. R.](#); Rentería-Gómez, Á.; Kim, M. J.; Gutierrez, O.; Wickens, Z. K. Mechanism of Z-Selective Allylic Functionalization via Thianthrenium Salts. *J. Am. Chem. Soc.* **2024**, *146*, 13689–13696.
4. Elgindy, C.; [Gogoi, A. R.](#); Rentería-Gómez, Á.; Park, B.; Das, D.; Obertone, C. E.; Dherange, B. D.; Gutierrez, O.; Levin, M. D. Mechanisms and Synthetic Applications of Cyclic, Nonstabilized Isodiazenes: Nitrogen-Atom Insertion into Pyrrolidines and Related Rearrangements. *J. Am. Chem. Soc.* **2025**, *147*, 28179–28188.
5. Peng, Q.; [Gogoi, A. R.](#); Renteria-Gomez, A.; Gutierrez, O.; Scheidt, K. A., Visible Light-Induced Coupling of Carboxylic Acids with Alcohols and Amines, *Chem* **2023**.
6. Aguilera, M. C.; [Gogoi, A. R.](#); Lee, W.; Liu, L.; Brennessel, W. W.; Gutierrez, O.; Neidig, M. L. Insight into Radical Initiation, Solvent Effects, and Biphenyl Production in Iron-Bisphosphine Cross-Couplings. *ACS Catal.* **2023**, *13*, 8987–8996.
7. Leong, D. W.; [Gogoi, A. R.](#); Maity, T.; Lee, C.-I.; Bhuvanesh, N.; Gutierrez, O.; Ozerov, O. V. Abstraction of Hydride from Alkanes and Dihydrogen by the Perfluorotriptyl Cation. *Angew. Chem. Int. Ed Engl.* **2025**, *64*, e202422190.
8. Das, M.; [Gogoi, A. R.](#); Sunoj, R. B. Molecular Insights on Solvent Effects in Organic Reactions as Obtained through Computational Chemistry Tools. *J. Org. Chem.* **2022**, *87*, 1630–1640.
9. Youshaw, C. R.; Yang, M.-H.; [Gogoi, A. R.](#); Rentería-Gómez, A.; Liu, L.; Morehead, L. M.; Gutierrez, O. Iron-Catalyzed Enantioselective Multicomponent Cross-Couplings of  $\alpha$ -Boryl Radicals. *Org. Lett.* **2023**, *25*, 8320–8325.
10. Day, C. S.; Renteria-Gomez, A.; Ton, S. J.; [Gogoi, A. R.](#); Gutierrez, O.; Martin, R., Elucidating Electron-Transfer Events in Polypyridine Nickel Complexes for Reductive Coupling Reactions. *Nat. Catal.* **2023**, *6*, 244–253.
11. Kang, S.; Cen, W.; [Gogoi, A. R.](#); Piña, J.; Suresh, A.; Ramirez, F.; Gutierrez, O.; Thomas, A. A. Mechanistically Driven Development of Kumada Catalyst-Transfer Polymerizations: A Rapid Injection NMR Study. *ACS Catal.* **2025**, 20773–20785.
12. Crockett, M.P.; Pina, J.; [Gogoi, A. R.](#); Lalisce, R. F.; Nguyen, A.V.; Gutierrez, O.; Thomas, A. A. Breaking the tert-Butyllithium Contact Ion Pair: A Gateway to Alternate Selectivity in Lithiation Reactions, *J. Am. Chem. Soc.* **2023**, *145*, 10743–10755.

13. Wu, F.-P.; Lenz, M.; Suresh, A.; [Gogoi, A. R.](#); Tyler, J. L.; Daniliuc, C. G.; Gutierrez, O.; Glorius, F. Nitrogen-to-Functionalized Carbon Atom Transmutation of Pyridine. *Chem. Sci.* **2024**, *15*, 15205–15211.
14. Zhu, J. L.; Schull, C. R.; Tam, A. T.; Rentería-Gómez, Á.; [Gogoi, A. R.](#); Gutierrez, O.; Scheidt, K. A. Photoinduced Acylations via Azolium-Promoted Intermolecular Hydrogen Atom Transfer. *J. Am. Chem. Soc.* **2023**, *145*, 1535–1541.
15. Altundas, B.; Alwedi, E.; Song, Z.; [Gogoi, A. R.](#); Dykstra, R.; Gutierrez, O.; Fleming, F. F. Dearomatization of Aromatic Asmic Isocyanides to Complex Cyclohexadienes. *Nat. Commun.* **2022**, *13*, 6444.
16. Thompson, R. R.; Figgins, M. T.; Wannipurage, D. C.; Renteria-Gomez, A.; [Gogoi, A. R.](#); Telser, J.; Tierney, D. L.; Neben, M. C.; Demeshko, S.; Gutierrez, O.; Powers, D. C. P-P Coupling with and without Terminal Metal-Phosphorus Intermediates. *J. Am. Chem. Soc.* **2025**, *147*, 5350–5359.
17. Rentería-Gómez, A.; Lee, W.; Yin, S.; Davis, M.; [Gogoi, A. R.](#); Gutierrez, O. General and Practical Route to Diverse 1-(Difluoro)Alkyl-3-Aryl Bicyclo[1.1.1]Pentanes Enabled by an Fe-Catalyzed Multicomponent Radical Cross-Coupling Reaction. *ACS Catal.* **2022**, *12*, 11547–11556.
18. Mandal, H.; Ogunyemi, O. J.; Nicholson, J. L.; Orr, M. E.; Lalis, R. F.; Rentería-Gómez, Á.; [Gogoi, A. R.](#); Gutierrez, O.; Michaudel, Q.; Goodson, T., 3rd. Linear and Nonlinear Optical Properties of All-Cis and All-Trans Poly(p-Phenylenevinylene). *J. Phys. Chem. C Nanomater. Interfaces* **2024**, *128*, 2518–2528.

manuscripts under review or preparation are available at: <https://achyutrgogoi.github.io>