

Alexander M. Chang

Email: achang67@stanford.edu
Department of Chemistry | Stanford University

EDUCATION

- 2019 – Present **Stanford University** | Stanford, CA
Ph.D. | Chemistry
Research Advisor: Prof. Todd J. Martínez
- 2015 – 2019 **Yale University** | New Haven, CT
B.S. | Chemistry, Applied Mathematics (Distinction in both Majors)
Research Advisor: Prof. Victor S. Batista
Cumulative GPA: 3.80/4.00

AWARDS & HONORS

- 2019 – 2022 Stanford Graduate Fellowship in Science and Engineering
Stanford University – Department of Chemistry
- 2019 Arthur Fleischer Award (for Outstanding Performance in Chemistry)
Yale University – Department of Chemistry
- 2016 Yale College Freshman Summer Research Fellowship
Yale University

ORAL PRESENTATIONS

- 2018 Berkeley Commonplace Society Senior Mellon Forum | New Haven, CT
- 2018 Solar Meeting at Yale University | New Haven, CT

POSTER PRESENTATIONS

- 2019 257th ACS National Meeting | Orlando, FL
- 2018 Boston University Cokerfest Symposium | Boston, MA

PUBLICATIONS

02. Hammett Neural Networks: Prediction of Frontier Orbital Energies of Tungsten-Benzylidyne Photoredox Complexes
Chang, A. M.; Freeze, J. G.; Batista, V. S., Hammett Neural Networks: Prediction of Frontier Orbital Energies of Tungsten-Benzylidyne Photoredox Complexes. *Chem. Sci.*, **2019**, *10*, 6844-6854.
01. Inverse Design of a Catalyst for Aqueous CO/CO₂ Conversion Informed by the Ni^{III}-iminothiolate Complex
Chang, A. M.; Rudshiteyn, B.; Batista, V. S., Inverse Design of a Catalyst for Aqueous CO/CO₂ Conversion Informed by the Ni(II)-iminothiolate Complex. *Inorg. Chem.* **2018**, *57* (24), 15474-15480.

SKILLS

Language/Script: Python, R, Bash, LaTeX
Programs: Gaussian, Avogadro, Keras/TensorFlow, ChemDraw, Excel, Prism

RESEARCH EXPERIENCES

2019 – Present Graduate Student, Stanford University | Advisor: Prof. Todd J. Martínez
• Developing and applying *ab initio* nanoreactor for automated reaction discovery

2017 – 2019 Undergraduate Researcher, Yale University | Advisor: Prof. Victor S. Batista
• Used a tight-binding linear combination of atomic potentials (TB-LCAP) inverse design to discover optimal nickel catalysts for CO oxidation; ran density functional theory (DFT) calculations on catalytic cycle, including relaxed scans and transition state calculations.
• Developed novel neural network methodology using Hammett parameters to describe ligands of tungsten catalyst for molecular design; employed machine learning techniques to examine data and hypothesize chemical theory behind mathematical trends.
• Created inverse design gradient descent algorithm using neural network scoring function to optimize catalyst ligands for reductive power

Summer 2016 Undergraduate Researcher, Yale University | Advisor: Prof. Seth Herzon
• Aided in synthesis of precolibactins

Summer 2014 Summer Science Program at New Mexico Tech | Socorro, NM

TEACHING EXPERIENCES

2019 Yale Young Global Scholars Instructor | Yale University
• Guided high schoolers on their own machine learning research projects
• Created/gave seminars on probability, machine learning, research ethics, and geophysics
• Led discussion sections on lectures by Yale faculty

2018 Center for Teaching and Learning Science & QR Tutor | Yale University
• Tutored freshmen each for 1 hr/week in organic chemistry

2015 – 2016 MathCounts Outreach Instructor | Nathan Hale School, New Haven CT
• Created lecture plans and led group sessions for MathCounts

LEADERSHIP & VOLUNTEER EXPERIENCES

2020 – Present Student Affairs Committee for Chemistry Department | Stanford University

2016 – 2018 Volunteers Around the World Yale Chapter | Peru; Dominican Republic
2017 – 2018 Team Co-Leader and Head of Finances

2015 – 2019 Davenport Pops Orchestra | Yale University
2017 – 2018 Director of Development | 2016 – 2017 Treasurer