

Jade I. Fostvedt, Ph.D.
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Education and Professional Experience

Teaching Assistant Professor of Chemistry <i>Focus:</i> general and inorganic chemistry	University of North Carolina at Chapel Hill 2022-present
Ph.D. in Synthetic Inorganic Chemistry <i>Advisor:</i> Prof. John Arnold <i>Thesis Title:</i> Design of Niobium and Tantalum Systems for Small Molecule Activation	University of California, Berkeley 2017-2022
B.S. in Chemistry, <i>summa cum laude</i> <i>Advisor:</i> Dr. James D. Hoefelmeyer <i>Thesis Title:</i> Dehydrodechlorination of methylene chloride, chloroform, and chlorodiphenylmethane in the presence of Ga/N frustrated Lewis pairs Awarded "Thesis with Distinction" by the University Honors Committee	University of South Dakota 2013-2017

Teaching Experience

Instructor (Fall 2022) *CHEM 101: General Descriptive Chemistry*, lecture, UNC-CH
Instructor (Fall 2022) *CHEM 251: Introduction to Inorganic Chemistry*, lecture, UNC-CH
Course Designer (Spring 2022) *Foundations of Discovery Learning for College of Chemistry Transfer Students*, Berkeley; course to be offered in Fall 2022
Instructor and Course Designer (Summer 2021) *Preparation for General Chemistry for College of Chemistry Majors*, lecture and lab, Berkeley Summer Bridge program
Graduate Student Instructor (Fall 2019) *Introduction to Bonding Theory* (grad level), Berkeley
Graduate Student Instructor (Fall 2019) *Fundamentals of Inorganic Chemistry* (grad level), Berkeley
Graduate Student Instructor (Spring 2019) *Advanced Inorganic Chemistry II*, Berkeley
Graduate Student Instructor (Fall 2017) *Organic Chemistry Laboratory II*, Berkeley
Undergraduate Laboratory Teaching Assistant (Spring 2017) *Chemistry for Educators*, USD
Undergraduate Laboratory Teaching Assistant (Fall 2016) *Honors General Chemistry*, USD
Chemistry Tutor (Fall 2015) General and organic chemistry tutor, University of Montana

Pedagogical Training

Chemical Education Weekly Seminar (Fall 2020-Spring 2022) Attend and present at weekly seminar series for chemical education enthusiasts.

- Attendees include research faculty, lecturers, graduate and undergraduate students from chemistry, physics, and learning sciences departments at Berkeley.
- Presentations: Feedback on Course Design: Foundations of Discovery Learning for College of Chemistry Transfer Students (April 2022); Promoting Persistence in STEM: Assessment of Summer Bridge Chemistry Program (Sept. 2021); Feedback on Course Design: Preparation for General Chemistry for College of Chemistry Majors (April 2021); Empowering Scientists & Engineers to Engage in Virtual K-12 Outreach (Nov. 2020).

Certificate in Teaching and Learning in Higher Education (Spring 2022) *Berkeley Graduate Division*.

- Completed a series of workshops on teaching and learning, attended pedagogy and ethics trainings, conducted teaching observation and consultation with faculty mentor, designed a mock course, created a teaching portfolio.

Practicum in Science & Math Education Research & Development (Fall 2020) Graduate-level course in the learning sciences department, Berkeley.

Teaching and Learning in Higher Education (Spring 2020) Graduate-level pedagogy course, Berkeley.

Professional Preparation: Supervised Teaching of Chemistry (Fall 2017) Graduate-level chemistry pedagogy course, Berkeley.

Awards and Fellowships

NSF Graduate Research Fellowship (Berkeley)	2018-2022
Chancellor's Fellowship for Graduate Study (Berkeley)	2017-2022
Outstanding Graduate Student Instructor Award (Berkeley)	2020
Teaching Effectiveness Award (Berkeley)	2020
Chemistry Instructional Achievement Award (Berkeley)	2020
Goldwater Scholarship (USD)	2016-2017
Pardee Senior Prize in Chemistry (USD)	2016
Undergraduate Research Excellence Award (USD)	2016
Freshman Chemistry Student of the Year (USD)	2014
Presidential Alumni Scholarship (USD)	2013-2017

Mentorship and Service

Undergraduate Mentees at Berkeley

- Anukta Jain (January 2019-May 2022). Project: synthetic and computational studies of Nb and Re complexes.
- Ryan Roo (August 2021-May 2022). Project: design and evaluation of programs to increase retention and success of underrepresented students within the Berkeley College of Chemistry.
- Diego Alcantar, Sacy Lopez-Flores, and Jocelyne Mendoza Perez (September 2021-May 2022). Summer Bridge 2021 alumni. Project: literature review of group 5 pi-loaded imido complexes.

High School Mentee at USD

- Connor Richards (Summer 2016). Research Apprenticeship Program collaboration between USD and Red Cloud Indian School. Project: synthesis of Ga/N frustrated Lewis pairs.

Service Activities

- **Outreach Volunteer Team Leader, Content Developer, Steering Committee, and Campus Coordinator for Bay Area Scientists in Schools outreach program** (Spring 2018-present). Community Resources for Science, SF Bay Area, CA.
- **Science Lesson Contributor** (March-April 2020). Science at Home Initiative, Community Resources for Science, SF Bay Area, CA.
- **Scientist Volunteer** (May-December 2019). Keeping Students Engaged in Science Collaboration, Oakland Unified School District, Oakland, CA.
- **President** (2013-2017). USD Chemistry Club, Vermillion, SD.
- **Founder and Co-President** (2016-2017). USD Women in STEM Club, Vermillion, SD.

Research Experience

Chemical Education Researcher (May 2021-May 2022) Collaborate with Prof. Anne Baranger, Associate Dean of Diversity, Equity, and Inclusion in the College of Chemistry (CoC), Berkeley.

- Design programming targeted at junior transfer students and incoming freshman that aims to increase retention of underrepresented students in the CoC.
- Develop and employ survey instruments and interview protocols to assess student sense of belonging within the CoC and STEM fields in general, science identity, and self-assessed confidence in chemistry learning ability.

Graduate Researcher (August 2017-May 2022) Inorganic chemist with Prof. John Arnold at Berkeley.

- Synthesize early transition metal complexes and study reactivity toward small inert gas molecules.
- Collect and solve single crystal X-ray diffraction data at the Advanced Light Source, Lawrence Berkeley National Lab.
- Laboratory safety coordinator, 2018-present; UC Berkeley Excellence in Lab Safety Award, 2019.

Undergraduate Research Assistant (August 2014-May 2015; June 2016-May 2017) Inorganic chemist with Dr. James Hoefelmeyer at USD.

- Synthesized the frustrated Lewis pair dichloro(quinolin-8-yl)-gallium(III) and discovered its ability to activate C-Cl bonds.

Undergraduate Research Assistant (January-May 2016) Bioinorganic chemist with Dr. Dong Wang at the University of Montana.

- Explored C-H bond activation with dinuclear iron catalyst modeled after methane monooxygenase.

National Nanotechnology Infrastructure Network Research Experience for Undergraduates at Stanford University (June-August 2015) Full-time research assistant with Prof. Reinhold Dauskardt, Materials Science & Engineering Department.

- Optimized synthesis of novel hybrid nanocomposite material for use in high-performance aerospace applications and explored imidization and cross-linking reactions of polyimides in molecular-scale confinement.

Research Experience for Undergraduates at USD (May-August 2014) Full-time research assistant with Dr. James Hoefelmeyer.

- Synthesized titanium dioxide nanorods and phase-transferred nanorods from organic to aqueous medium via interdigitation with an amphiphilic polymer.

Peer-Reviewed Publications

1. **Fostvedt, J. I.**; Mendoza, J.; Lopez-Flores, S.; Alcantar, D.; Bergman, R. G.; Arnold, J. Engendering reactivity at group 5–heteroatom multiple bonds via π -loading. *Chem. Sci.* **2022**, *13*, 8224-8242.
2. Jain, A.*; **Fostvedt, J. I.***; Kriegel, B. M.; Small, D. W.; Grant, L. N.; Bergman, R. G.; Arnold, J. [3+2] Cycloadditions and retro-cycloadditions of niobium imido complexes: an experimental and computational mechanistic study. *Inorg. Chem.* **2022**, *61*, 6574-6583. *Contributed equally
3. **Fostvedt, J. I.**; Boreen, M. A.; Bergman, R. G.; Arnold, J. A diverse array of C–C bonds formed at a tantalum metal center. *Inorg. Chem.* **2021**, *60*, 9912-9931.
4. **Fostvedt, J. I.***; Kriegel, B. M.*; Grant, L. N.*; Obenhuber, A. H.; Lohrey, T. D.; Bergman, R. G.; Arnold, J. 1,2-Addition and cycloaddition reactions of niobium bis(imido) and oxo-imido complexes. *Chem. Sci.* **2020**, *11*, 11613-11632. *Contributed equally

- Lohrey, T. D.; Cortes, E. A.; **Fostvedt, J. I.**; Oanta, A. K.; Jain, A.; Bergman, R. G.; Arnold, J. Diverse reactivity of a rhenium(V) oxo imido complex: [2+2] cycloadditions, chalcogen metathesis, oxygen atom transfer, and protic and hydridic 1,2-additions. *Inorg. Chem.* **2020**, *59*, 11096-11107.
- Lohrey, T. D.; **Fostvedt, J. I.**; Bergman, R. G.; Arnold, J. Electron acceptors promote proton-hydride tautomerism in low valent rhenium β -diketimines. *Chem. Commun.* **2020**, *56*, 3761-3764.
- Fostvedt, J. I.**; Lohrey, T. D.; Bergman, R. G.; Arnold, J. Structural diversity in multinuclear tantalum polyhydrides formed *via* reductive hydrogenolysis of metal-carbon bonds. *Chem. Commun.* **2019**, *55*, 13263-13266.
- Isaacson, S. G.; **Fostvedt, J. I.**; Koerner, H.; Baur, J. W.; Lionti, K.; Volksen, W.; Dubois, G.; Dauskardt, R. H. Low density hybrid nanocomposites with polyimides in molecular scale confinement. *Nano Lett.* **2017**, *17*, 7040-7044.
- Son, J. H.; Tamang, S. R.; **Fostvedt, J. I.**; Hoefelmeyer, J. D. Dehydrodechlorination of methylene chloride, chloroform, and chlorodiphenylmethane in the presence of Ga/N Lewis pairs. *Organometallics* **2017**, *36*, 474-479.
- Wilkerson, R. J.; Elder, T.; Sowinski, O.; **Fostvedt, J. I.**; Hoefelmeyer, J. D. Phase transfer of oleic acid stabilized rod-shaped anatase TiO₂ nanocrystals. *Surf. Sci.* **2016**, *648*, 333-338.

Selected Presentations and Workshops

- Fostvedt, J. I.; Fornaciari, J. C. Bay Area Scientists Inspiring Students, Virtually! Science Talk Virtual Conference, March 2021 (poster).
- Fostvedt, Jade. "Phenomena in Science Learning." Middle School Science Teacher Professional Development Session, Oakland Unified School District, October 2020.
- Fostvedt, Jade. "Teaching Conference for First-Time Graduate Student Instructors - Chemistry Discipline Cluster Workshop." Graduate Student Instructor Teaching & Resource Center, UC Berkeley, August 2020.
- Fostvedt, Jade. "Fourth of July Family Science: How Fireworks Work." Social Finance, Inc. Webinar, July 2020. Partially available to view at <https://www.pbn2au.com/lab-videos-1>.
- Fostvedt, Jade. "Science at Home: Kitchen Chromatography." *YouTube*, April 2020. <https://www.youtube.com/watch?v=7IqjZdYF3hM&t=1s>.
- Fostvedt, Jade. "Science at Home: Kitchen Chemistry." *YouTube*, March 2020. <https://www.youtube.com/watch?v=PZj0HKzDYSk&t=1s>.
- Fostvedt, J. I.; Arnold, J. Towards Low Valent Early Metal Systems: Small Molecule Reactivity of Tantalum *N*-Heterocyclic Carbene Complexes. UC Chemical Symposium, Lake Arrowhead, CA, March 2019 (presentation).
 - Awarded first place lightning talk.
- Fostvedt, J. I.; Tamang, S. R.; Son, J. H.; Hoefelmeyer, J. D. Synthesis of the frustrated Lewis pair dichloro(quinolin-8-yl)gallium(III) and its reaction with chloroform. 251st ACS National Meeting & Exposition, San Diego, CA, March 2016 (poster).
- Fostvedt, J. I.; Isaacson, S. G.; Dauskardt, R. H. Infiltration, imidization, and cross-linking of polyimides in molecular-scale confinement. 251st ACS National Meeting & Exposition, San Diego, CA, March 2016 (presentation).