Chance Lander

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Education

2021 – 2026 **Ph.D., Physical Chemistry**, University of Oklahoma, Norman, OK.
2016 – 2020 **B.S., Biochemistry**, University of Texas at Dallas, Richardson, TX.

Academic Appointment

Summer 2023 **Graduate Student Internship**, LANL, Los Alamos, New Mexico.
Advisor: Dr. Yu Zhang
Fall 2021 – Present **Graduate Research Assistant**, University of Oklahoma, Norman, OK.
Advisor: Dr. Yihan Shao

Fellowships & Awards

Spring 2025	**Excellence in Graduate Research Award**	University of Oklahoma
Spring 2023	**Roger E. Frech Scholarship**	University of Oklahoma
Spring 2023	**Harwell Endowed Scholarship**	University of Oklahoma
Summer 2021	**Kenneth M. Nicholas Graduate Fellowship**	University of Oklahoma
Fall 2016 – 2020	**Academic Excellence Scholarship with Distinction**	University of Texas at Dallas

Research Experience (with Various Collaborators)

2024 – Present **Descriptors for Chemical Reactivity in Surfaces and Metal Organic Frameworks**
Collaborators: Drs. Hyunho Noh (OU), Bin Wang (Tufts), Kasun Gunasooriya (OU), Yuezhi Mao (SDSU)
- Investigated scaling relations of adsorbates on metal surfaces using energy decomposition analysis, supporting older models with newer analysis techniques.
- Computationally supported hydrogen atom reactivity studies in Ce and Ti MOFs, relevant as catalytic descriptors and important for photoredox chemistry.
- Aided in the exploration of missing linker defects in Ti MOFs.

EDA | Scaling Relations | MOF | PCET

2023 - 2025 **Investigation of Stereo Selectivity in Metal Catalyzed Furanosylation Reactions**
Collaborators: Drs. Indrajeet Sharma and Kenneth Nicholas (OU)
- Explored potential reaction mechanisms for metal catalyzed furanosylation reactions, which are important for synthesis of medicinal compounds.
- Rationalized the *cis*-selectivity in furanosylation product formation based on kinetic and thermodynamic relations.

Organometallic | Catalysis

2024 – 2025 **Increased Photostability of Quantum Dots through Ligand Stabilization**
Collaborators: Dr. Yitong Dong (OU)
- Provided computational justification for the increased stabilization of perovskite quantum dots with small aromatic vs. larger aliphatic ligands.

Quantum Dots | Adsorption | PWDFT | GPW

2023 – Present **Excitonic Properties in Molecular Thin Films**
Collaborators: Drs. Madalina Furis (OU), Lloyd Bumm (OU), Sergei Tretiak and Yu Zhang (LANL)
- Investigated the excitonic coupling between dimers in organic semiconductor thin-films for photovoltaic materials.
- Proposed a rationale for exciton coupling strengths in different molecular crystal materials.

Excitons | Molecular Crystals

2021 – Present **Organometallic Catalysts Design and Mechanistic Insight**
Collaborators: Dr. Kenneth Nicholas (OU)
- Proposed potential catalysts and reaction mechanisms for the decomposition of the greenhouse gas nitrous oxide.
- Provided mechanistic insight into the diperoxo to monodioxo conversion in molybdenum porphyrin species, relevant to O_2 sequestration and oxygen atom transfer (OAT) reactions.

Catalysis | GHG | OAT

† Indicates equal contribution.

Pre-Prints or Under Review

(16) Sengupta, S.; Pei, Z.; **Lander, C.**; Wickizer, C.; Homma, Y.; Afashari, H.; Huo, P.; Zhang, Y.; Tretiak, S.; Bumm, L.; Furis, M.; Shao, Y. Towards a Theoretical Understanding of Excitonic Properties of Pthalocyanine Thin Films. I. Low-Temperature Exciton Absorption Spectra. *ChemRxiv* **2025**.

(15) Rong, J.; Chen, Z.; Wickizer, C.; Zhao, C.; **Lander, C.**; Zhou, X.; Haider, A.; Shao, Y.; Li, Z. A Metal-Free Universal Approach for Aromatic Radiofluorination via Arylbenziodoxolones. *manuscript under review* **2025**.

Publications

(14) Londoño-Salazar, J.; Ye, G.; **Lander, C. W.**; Kapfunde, T. A.; Yamamoto, N.; Akhmedov, N. G.; Zhang, Y.; Shao, Y.; Richter-Addo, G. B. Nitric Oxide Insertion into a Metalloporphyrin–Carbon Bond. *JACS Au* **2026**, jacsau.5c01770.

(13) Altınçekiç, N. G.; **Lander, C. W.**; Yu, J.; Roslend, A.; Shao, Y.; Noh, H. Proton, Electron, and Hydrogen-Atom Transfer Thermodynamics of the Metal–Organic Framework, Ti-MIL-125, Are Intrinsically Correlated to the Structural Disorder. *J. Am. Chem. Soc.* **2025**, jacs.5c10498.

(12) DiCenso, Jesse[†]; **Lander, C.**[†]; Pei, Z.; Sengupta, S.; Le, T.; Zhang, Y.; Gunasooriya, G. T. K. K.; Wang, B.; Mao, Y.; Shao, Y. Toward an Understanding of Linear Scaling Relations through Energy Decomposition Analysis. *JACS Au* **2025**, *5*, 3092–3103.

(11) Mi, C.; Gee, G. C.; **Lander, C. W.**; Shin, D.; Atteberry, M. L.; Akhmedov, N. G.; Hidayatova, L.; DiCenso, J. D.; Yip, W. T.; Chen, B.; Shao, Y.; Dong, Y. Towards non-blinking and photostable perovskite quantum dots. *Nat Commun* **2025**, *16*, 204.

(10) Singh, S. P.; Chaudhary, U.; **Lander, C. W.**; Daroczi, A.; Shao, Y.; Sharma, I. Iron-Carbene-Mediated Catalytic Activation of Conventional Thioglycosides for Stereoselective 1,2- *cis* -Furanosylations. *ACS Catal.* **2025**, *15*, 9886–9896.

(9) Altınçekiç, N. G.; **Lander, C. W.**; Roslend, A.; Yu, J.; Shao, Y.; Noh, H. Electrochemically Determined and Structurally Justified Thermochemistry of H atom Transfer on Ti-Oxo Nodes of the Colloidal Metal–Organic Framework Ti-MIL-125. *J. Am. Chem. Soc.* **2024**, *146*, 33485–33498.

(8) Pan, X.[†]; Snyder, R.[†]; Wang, J.N.[†]; **Lander, C.**[†]; Wickizer, C.[†]; Van, R.; Chesney, A.; Xue, Y.; Mao, Y.; Mei, Y.; Pu, J.; Shao, Y. Training machine learning potentials for reactive systems: A Colab tutorial on basic models. *J Comput Chem* **2024**, *45*, 638–647.

(7) Ghosh, B.; Alber, A.; **Lander, C. W.**; Shao, Y.; Nicholas, K. M.; Sharma, I. Catalytic Stereoselective 1,2- *cis* -Furanosylations Enabled by Enynal-Derived Copper Carbenes. *ACS Catal.* **2024**, *14*, 1037–1049.

(6) Ghosh, B.; Alber, A.; **Lander, C. W.**; Shao, Y.; Nicholas, K. M.; Sharma, I. Catalytic Activation of Thioglycosides with Copper-Carbenes for Stereoselective 1,2- *Cis* -Furanosylations. *Org. Lett.* **2024**, *26*, 9436–9441.

(5) Ingram, Z. J.; **Lander, C. W.**; Oliver, M. C.; Altınçekiç, N. G.; Huang, L.; Shao, Y.; Noh, H. Hydrogen Atom Binding Energy of Structurally Well-Defined Cerium Oxide Nodes at the Metal–Organic Framework–Liquid Interfaces. *J. Phys. Chem. C* **2024**, *128*, 9556–9565.

(4) Rusmore, T. A.; **Lander, C.**; Nicholas, K. M. Reaction Pathway for the Aerobic Oxidation of Phosphines Catalyzed by Oxomolybdenum Salen Complexes. *Eur J Inorg Chem* **2024**, *27*, e202300506.

(3) **Lander, C.**[†]; Satalkar, V.[†]; Yang, J.[†]; Pan, X.; Pei, Z.; Chatterji, A.; Liu, C.; Nicholas, K. M.; Cichewicz, R. H.; Yang, Z.; Shao, Y. Visualization of electron density changes along chemical reaction pathways. *Molecular Physics* **2023**, *121*, e2113566.

(2) Jana, A. K.; **Lander, C. W.**; Chesney, A. D.; Hansmann, U. H. E. Effect of an Amyloidogenic SARS-COV-2 Protein Fragment on α-Synuclein Monomers and Fibrils. *J. Phys. Chem. B* **2022**, *126*, 3648–3658.

(1) Nicholas, K. M.; **Lander, C.**; Shao, Y. Computational Evaluation of Potential Molecular Catalysts for Nitrous Oxide Decomposition. *Inorg. Chem.* **2022**, *61*, 14591–14605.

Presentations

Oral	*ACS Southwest Regional Meeting* (2023),	*ACS San Diego* (2025)
Poster	*ACS Southwest Regional Meeting* (2024),	*ACS New Orleans* (2024)

Technical Skills

Software	Q-Chem, Gaussian, CP2K, VASP, PySCF, LAMMPS, ASE
Languages	Python, C/C++, FORTRAN

Teaching

2025	Physical Chemistry I Lecture
2025	Physical Chemistry I Lab Teaching Assistant
2021 – 2022	General Chemistry II Lab and Recitation Teaching Assistant

Membership and Outreach

2022 – 2024	*Graduate Student Senate*, University of Oklahoma
2022 – 2024	*Chemistry and Biochemistry Researchers*, University of Oklahoma Secretary (2022-2023) and Undergraduate Involvement Committee Chair (2023-2024)
2022 – 2024	*Graduate Student Recruitment Committee*, University of Oklahoma