Seth Martin

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Education

Ph.D. Chemistry — *Univ. of Kansas*
Thesis: Structure and thermodynamics of solid/fluid interfaces: simulation and theory — June 2021
Advisor: Brian Laird — with Honors

B.S. Chemistry — *Univ. of Kansas*
May 2010

Research Experience

Graduate Research Assistant — *Univ. of Kansas*
Advisor: Brian Laird — Spring 2017 - Spring 2021
Use simulation and theory to probe the structure and thermodynamics of interface systems. Outputs include:

- Sole development of a hard disk Monte Carlo simulation code
- Code contributions to two open source simulation software suites
- Development of a Genetic Algorithm software for optimization of ReaxFF force field parameters
- Development of many data analysis and visualization Python notebooks used for published research

Graduate Research Assistant — *Univ of Kansas*
Advisor: Marco Caricato — Fall 2016

- Use Gaussian software to find ground states of model electron transfer systems and apply a diabatization scheme to find couplings between diabatic states.

Professional Experience

Assistant Professor — *Univ. of Saint Mary*
Department of Chemistry
August 2021 - present

Teach a range of chemistry and physics classes, advise students, mentor research projects, develop instructional materials, and serve on University and division committees

Hazardous Materials Technician — *Univ. of Kansas*

Dept. of Environment, Health & Safety
Sep 2011 - Aug 2016

Collect, classify, and prepare hazardous waste for disposal:

- Safely collect all hazardous waste (laboratory, facilities/maintenance, etc) on campus and transport to central storage facility
- Be familiar with all applicable state and federal regulations for transport, storage, and safe handling of hazardous substances
- Coordinate with laboratory personnel regularly to ensure proper disposal of laboratory generated waste, including developing waste disposal plans for new waste streams
- Take part in chemical spill response
- Develop SOP's for waste handling and spill response activities

QC extraction chemist

Clinical Reference Laboratories
Lenexa, KS
Jun 2010 - Sep 2011

Prepare samples for chromatographic analysis:

- Perform SPE and liquid-phase extractions and derivatizations of human samples for drug testing (including GCMS, LCMS, ICP-MS, Head space GCMS)
- Preparation and analysis of immunoassay samples
- Prepare stock solutions for use in extractions

Teaching Experience

Assistant Professor — *Univ. of Saint Mary*

Physics II w/ Lab	Spring 2022
Engineering Physics I w/ Lab	Spring 2022
Inorganic Chemistry	Spring 2022
General Chemistry I w/ Lab	Fall 2021
Physics I w/ Lab	Fall 2021
Science of Cooking w/ Lab	Fall 2021

Research Mentoring

- Gabrielle Moore: Determination of Copper in Water Using PEI and UV-Vis Spectroscopy — Spring 2022
- Rebecca Porter: Weather Patterns Surrounding Wind Chill Extremes in Georgia — Spring 2022

Graduate Teaching Assistant

Univ. of Kansas
Dept. of Chemistry
Fall 2020

Physical chemistry for engineers lecture TA:

- Lead weekly virtual discussion sessions to practice problem solving and review concepts. Zoom breakout sessions allowed for smaller groups which I could check in with separately.
- Hold regular office hours. Help students learn general problem solving approaches and discuss concepts.

- Write detailed solutions and grade weekly problem sets and computational exercises.
- Grade exams.

Physical chemistry laboratory instruction including: Spring 2020
- Shift lab sessions to online format during campus shutdown due to COVID-19
- Lead pre-lab discussions focused on connecting the procedure to the underlying concepts.
- Oversee lab procedures and troubleshoot wet lab and computational exercises.
- Hold office hours. Provide guidance and lead students towards solving problems independently.
- Grade informal and formal lab reports, including design of my own rubric

Organic chemistry laboratory instruction including: Fall 2016
- Lead pre-lab discussions
- Provide safety lessons and ensure compliance with safety procedures
- Grade lab reports and tests
- Hold office hours to facilitate student problem solving and writing

Undergraduate research mentor *Univ. of Kansas*
Fall 2019 - Spring 2021

- Provide context and guidance for approaching computational research.
- Introduce programming skills necessary for computational research.
- Assess understanding of the research question, and problem solve alongside the student to improve weak spots.

Service

Saint Mary Undergraduate Research Forum Committee *Univ. of St. Mary*
Assisted in development of the undergraduate research forum and moderating two panel discussions. 2022

Secretary, Chemistry Graduate Student Organization *Univ. of Kansas*
Served as Secretary of the inaugural administration of the Chemistry GSO. 2017-2018

- Serve as a founding member of ChemGSO, including registering ChemGSO as an official student organization.
- Help plan meetings with the whole Chemistry graduate student body.
- Take and organize minutes of meetings.
- Volunteer in ChemGSO organized events.
- Manage ChemGSO files.

Facilitator, Jayhawks Give a Flock *Univ. of Kansas*
Served as a volunteer for University mandatory sexual assault prevention training. Sept. 2019

- Co-lead discussion with around 20 undergraduate students focused on identifying sexual assault and ways to actively prevent it.
- Review information provided by the KU Sexual Assault Prevention and Education Center to become familiar with active bystander sexual assault prevention.
- Attend training sessions for volunteers to prepare for leading discussions.

Scholarships & Awards

Paul and Helen Gilles Award 2021

Kristina May Paquette Scholarship 2020

Takeru Aya Higuchi Graduate Scholarship in Physical Chemistry 2019

Cornelius McCollum Research Scholarship 2018

Undergraduate Scholarship 2005-2006

Conferences & Presentations

American Physical Society March Meeting *Virtual Meeting*
Talk – Hard disks in confinement: March 2021
the thermodynamic effects of container shape

Virtual Conference on Theoretical Chemistry *Virtual Meeting*
Lightning talk & Poster – Interfacial free energy July 2020
of curved surfaces in two dimensions

American Physical Society March Meeting *Virtual Meeting*
Virtual Presentation – Up against a wall: March 2020
interfacial free energies at curved surfaces

Gordon Research Conference: Chemistry and Physics of Liquids *Holderness, NH*
Poster – Morphometric Thermodynamics: August 2019
Testing Theory with Simulation

DFT Spring School *Albert Ludwigs Universität*
Short Talk & Poster – Surface free energies in two dimensions: *Freiburg im Breisgau, Germany*
Comparing theory to simulation March 2019

Kansas Physical Chemistry Symposium *Kansas State University*
Talk – Surface Free Energy in Two Dimensions September 2018

ACS Midwest Regional Meeting *University of Kansas*
Talk – Surface Free Energy in 2D: Comparing Theory to Simulation October 2017

Kansas Physical Chemistry Symposium *Wichita State University*
Poster – Probing electron transfer between covalently bonded February 2017

donor-acceptor fragments

Professional Memberships

American Physical Society - Member *2020 - present*

American Association of Physics Teachers - Member *2022 - present*

Specialized Training

DFT Spring School *Albert Ludwigs Universität*
Spring school focused on classical density functional theory. *Freiburg im Breisgau, Germany*
March 2019

CCP5 Summer School *Lancaster University, UK*
Summer school focused on molecular simulation techniques and theory. July 2017

Publications

[1] Seth C. Martin, Hendrik Hansen-Goos, Roland Roth, and Brian B. Laird. Inside and out: Surface thermodynamics from positive to negative curvature. *The Journal of Chemical Physics*, 157(5):054702, aug 2022.

[2] Seth C. Martin, Hendrik Hansen-Goos, and Brian B. Laird. Surface Free Energy of a Hard-Disk Fluid at Curved Hard Walls: Theory and Simulation. *The Journal of Physical Chemistry B*, 124(36):7938–7947, September 2020. Cover Article.

[3] Seth C. Martin, Brian B. Laird, Roland Roth, and Hendrik Hansen-Goos. Thermodynamics of the hard-disk fluid at a planar hard wall: Generalized scaled-particle theory and Monte Carlo simulation. *The Journal of Chemical Physics*, 149(8):084701, August 2018. Featured Article; Chose for Scilight.

[4] Alessandro Biancardi, Seth C. Martin, Cameron Liss, and Marco Caricato. Electronic Coupling for Donor-Bridge-Acceptor Systems with a Bridge-Overlap Approach. *Journal of Chemical Theory and Computation*, 13(9):4154–4161, September 2017.