Seth Martin

598 E. 12th St
Tonganoxie, KS 66086
(620)423-1834

sethcmart@gmail.com
github.com/scmartin
linkedin.com/in/sethcmartin

Education

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

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

Research Experience

Assistant Professor — *Univ. of Saint Mary*, August 2021 – present

Mentor semester-long undergraduate research projects

- Grace Miller: Effecs of Water Conditions on UV Blocking Capability of Sunscreens
- Russell Rhoads: Number-density Dipoles for Surface Analysis in Simulations
- Grace Sanford and Makenzy Curtis: GC Analysis of Gaillardia pulchella Seed Extract
- Gabrielle Moore: Determination of Copper in Water Using PEI and UV-Vis Spectroscopy

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
- Analysis of reactive force-fields for studying metal / metal oxide interfaces
- Analyze the interface geometry dependence of the interfacial free energy of the hard-disk fluid at hard walls for a variety of wall geometries
- Sole development of a genetic algorithm software for optimization of ReaxFF force-field parameters and application to metal-doped amorphous silica catalysis
- Code contributions to two open-source simulation softwares (HOOMD-blue and DynamoMD) to allow for new types of simulations and data analysis
- Development of a variety of data analysis and visualization Python scripts used in research listed above

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.

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.

Conferences & Presentations

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

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

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

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

DFT Spring School — *Albert Ludwigs Universität Freiburg im Breisgau, Germany*
Short Talk & Poster — Surface free energies in two dimensions: 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 donor-acceptor fragments — February 2017

Professional Experience

Assistant Professor

Univ. of Saint Mary
Department of Chemistry
August 2021 – present

Teach a range of physics, chemistry, and engineering classes; advise students; mentor research projects; develop instructional materials (including lectures, demonstrations, active-learning activities, laboratories, etc.); 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

Specialized Training

DFT Spring School

Albert Ludwigs Universität
Freiburg im Breisgau, Germany
March 2019

Spring school focused on classical density functional theory.

CCP5 Summer School

Lancaster University, UK
July 2017

Summer school focused on molecular simulation techniques and theory.

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

Professional Memberships

American Physical Society - Member	*2020 - present*
American Association of Physics Teachers - Member	*2022 - present*

Teaching Experience

Assistant Professor — *Univ. of Saint Mary, Depts. of Chemistry and Math*

Physics II w/ Lab	Spring 2023
Engineering Strength of Materials	Spring 2023
Science of Cooking w/ Lab	Spring 2023
Physics I w/ Lab	Fall 2022
Engineering Physics II w/ Lab	Fall 2022
Physical Chemistry I w/ Lab	Fall 2022
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

Graduate Teaching Assistant — *Univ. of Kansas, Dept. of Chemistry*

Physical chemistry for engineers lecture TA: Fall 2020

- 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

Graduate research mentor *Univ. of Kansas*
Laird group, Dept. of Chemistry
Provide context and guidance for approaching computational research for undergraduate student, including instruction in python programming and use of LAMMPS simulation software. Fall 2019 – Spring 2021

Service

Science and Mathematics Undergraduate Research Forum Committee *Univ. of St. Mary*
Vice Chair 2023

Science and Mathematics Undergraduate Research Forum Committee *Univ. of St. Mary*
2022

University committee assignments *Univ. of St. Mary*
Academic Affairs 2022 – 2024
Educational Technology 2022 – 2024

Jayhawks Give a Flock *Univ. of Kansas*
Facilitator September 2019

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