Kristine Q. Loh

Pronouns: she/her/hers | loh00014@umn.edu | (786) 797-9792 | kristine-loh.github.io

EDUCATION

University of Minnesota – Twin Cities (UMN) Minneapolis, MN
Doctor of Philosophy, Chemical Engineering Anticipated Graduation: May 2025
National Science Foundation Graduate Research Fellow Cumulative GPA: 3.68
College of Science and Engineering Fellow
Tentative Dissertation Title: Nontoxic Nanomaterials for Photovoltaics in the Built Environment

Drexel University, Pennoni Honors Program, Summa Cum Laude Philadelphia, PA
Accelerated Master of Science in Materials Science and Engineering June 2020
Thesis Title: Optimization of Photodetection Analysis of MXene Thin Films Cumulative GPA: 3.96
Bachelor of Science in Chemical Engineering
Certificate in Technical Communication and Publishing

Ruhr-Universität Bochum Bochum, Germany
Exchange Undergraduate Student in Mechanical Engineering April to June 2018

TEACHING EXPERIENCE

University-Level

Augsburg University SCI 123: The Science of Food and Cooking September 2024 to Present
Minneapolis, MN
Adjunct Faculty Instructor in Physics
- Served as Instructor of Record for an interdisciplinary, joint lecture/lab class of 26 non-STEM majors
- Created new laboratory on foam structure in vegan meringues
- Updated course management software and laboratory activities for the second iteration of the night class

UMN MATS 4400: Senior Design Project January 2024 to May 2024
Minneapolis, MN
Teaching Assistant for Lead Instructor Prof. Vivian Ferry
- Mentored 4 materials science senior design teams through the engineering design process, including engineering and financial calculations as well as technical communication
- Provided detailed feedback for 4 major reports and presentations, as well as 3 homework assignments

Augsburg University / UMN Preparing Future Faculty Program September 2022 to May 2023
Minneapolis, MN
Co-Instructor for Lead Instructor Prof. Moumita Dasgupta
- Co-taught Physics for Fine Arts undergraduate class (designed and presented three lecture/lab activities and assisted with weekly labs) at Augsburg University (a Primarily Undergraduate Institution)
- Adapted first guest lecture and lab to online setting within two days (campus closure)
- Prepared syllabus, teaching philosophy, and diversity statement documents while learning about inclusive pedagogy, universal course design, and classroom assessment techniques

UMN CHEN 3401W: Junior Chemical Engineering Lab January 2023 to May 2023
Minneapolis, MN
Teaching Assistant for Lead Instructor Prof. Aditya Bhan
- Assisted 3 teams of 3 students in running weekly pilot plant experiments for 2 class sections
- Utilized Socratic method of asking and answering questions to guide student troubleshooting
- Received Council of Graduate Students (COGS) Outstanding Teaching Assistant Award (student-nominated) and departmental Outstanding Teaching Assistant Award (faculty-nominated)

UMN GCC 3011: Pathways to Renewable Energy January 2023
Minneapolis, MN
Guest Speaker/Technology Expert for Lead Instructor Prof. Uwe Kortshagen
- Presented my research on solar greenhouses and served as a technology expert for a team developing a business plan and pitch presentation around solar greenhouses

UMN CHEN 3102: Reaction Kinetics January 2021 to May 2021
Online (Minneapolis, MN)
Teaching Assistant for Lead Instructor Prof. Matthew Neurock
- Proctored exams for students with accommodations from the Disability Resource Center (DRC)
- Graded weekly homework assignments for 99 undergraduate students
- Received departmental Outstanding Teaching Assistant Award (faculty-nominated)

K-12

Columbia University Introduction to Engineering July 2024
Online (New York City, NY)
Guest Speaker for Lead Instructor Rebecca Nolan
- Discussed chemical engineering careers with high-performing high school students

UMN ASM Camp July 2024
Minneapolis, MN
Co-Instructor for Lead Instructor Prof. Vivian Ferry
- Developed and co-led photoresistor activity for 30 high school juniors

UMN Eureka! Camp July 2023, 2024
Minneapolis, MN
Co-Instructor for Lead Instructor Prof. Vivian Ferry
- Developed and co-led polarized light art activity for 30 middle school students

UMN SciPride July 2023, 2024
St. Paul, MN
Solar Cell Activity Co-Lead
- Developed and co-led polarized solar cell physics activity for over 400 community members

UMN Science for All May 2023, 2024
Minneapolis, MN
Field Trip Liquid Nitrogen Activity Lead
- Developed and led liquid nitrogen ice cream activity for 30 – 50 middle school students

Murry Middle School Team Volunteer
- Developed and led one activity per year while volunteering to support monthly demonstrations for around 35 middle school students

MENTORSHIP EXPERIENCE

Research Mentorship

- Karin Anderson, *Undergraduate Research Opportunities Program Scholar* January 2025 to Present
  Project: Effect of Evapotranspiration on Solar Panel Cooling for Agrivoltaic Corn Fields in Minnesota
  Current Position: Undergraduate student in Mathematics and Computer Science at UMN
- Masoumeh Amirifard, *Mechanical Engineering PhD Student Trainee* August 2023 to Present
  Project: Quantum Dots for Agricultural Applications
  Current Position: PhD student in Mechanical Engineering at UMN
- Aquarina Hoanca, *Undergraduate Research Opportunities Program Scholar* August 2023 to Present
  Project: Effects of LSC Greenhouse Glazing Materials on Heating and Cooling Demands
  Current Position: Undergraduate student in Chemical Engineering at UMN

- Andy Chung, *Mech. Eng. in Energy and the Environment* (*ME³) REU Student* June 2023 to August 2023
  Project: From Compost to Carbon Dots: Plasma Synthesis of Carbon Nanodots from Biomass Waste
  Current Position: Master's student in Energy Systems Engineering at Lehigh University
- Adriana Chapez, *MRSEC REU Student* June 2022 to August 2022
  Project: Improving the Dispersion of Si/SiO_2 Quantum Dots
  Current Position: Undergraduate student in Mechanical Engineering at the University of Texas Rio Grande Valley
- Noura Rayes, *ME³ REU Student* June 2021 to August 2021
  Project: Increasing the Quantum Yield of Si Quantum Dots for Luminescent Solar Concentrators (LSCs)
  Current Position: PhD student in Materials Science and Engineering at the Penn State University

Current Professional Mentorship Program Participation

Formal mentees in SWE Mentor Network, UMN Women in Science and Engineering Initiative Undergrad-Grad Mentorship, UMN CEMS Graduate Student Mentorship Program, UMN Friend in STEM Research Mentorship, virtual Professional Advancement through Career Education (PACE), and GradSWE Mentorship Programs

RESEARCH EXPERIENCE

Ferry and Kortshagen Groups Minneapolis, MN
Graduate Research Fellow *January 2021 to Present*
Advisors: Profs. Vivian Ferry and Uwe Kortshagen
- Built techno-economic model in MATLAB to determine suitability of solar concentrator greenhouses as agrivoltaic systems in different locations by simulating solar energy generation and lettuce growth
- Developed tunable processing technique for passivating silicon nanocrystals (Si NCs) with high photoluminescence (PL) quantum yields for solar concentrator applications
- Characterized Si NCs using steady-state and time-resolved PL spectroscopy, as well as other surface characterization techniques, including x-ray diffraction spectroscopy (XRD), Fourier transform infrared spectroscopy (FTIR), and electron paramagnetic resonance spectroscopy (EPR)
- Assisted in the peer review process for a journal article about horticulture solar concentrators
- Supported fellow graduate students in reviewing written preliminary exams and doctoral theses

Nanomaterials for Energy Applications and Technology (NEAT) Lab Philadelphia, PA
Undergraduate Research Assistant *April 2017 to June 2020*
Students Tackling Advanced Research (STAR) Scholar *June to August 2016*
Advisor: Dr. Jason B. Baxter
- Investigated mechanisms of $Ti_3C_2T_x$ and $Mo_2TiC_2T_x$ film optoelectronic behavior in response to various stimuli through photoconductivity measurements
- Led research efforts on using Ti-doped hematite thin films synthesized using Successive Ionic Layer Adsorption and Reaction (SILAR) as an enhanced photoelectrochemical water splitter
- Analyzed SbSI microrods as novel pathways for electron transport using UV-Vis spectroscopy, scanning electron microscopy, and XRD
- Synthesized $CuSbS_2$ thin films using chemical bath deposition

Emmy Noether Research Group Bochum, Germany
Independent Research Project *April 2018 to June 2018*
Advisor: Dr.-Ing. Markus Richter
- Collaborated in two-member team to study ability of potassium phosphate to absorb carbon dioxide gas and hydrogen gas under various temperatures and pressures
- Used two-sinker magnetic suspension densimeter to collect experimental data and MATLAB to compile results

Johnson & Johnson Consumer, Inc. Fort Washington, PA
R&D Analytical Chemistry Co-op *September 2017 to March 2018*
Advisor: Dr. Michael Breslav
- Developed and executed active pharmaceutical ingredient (API) extraction tests for HPLC analysis
- Designed and conducted heat and humidity stress experiment to determine long-term stress effects on API degradation products
- Supported 5 analytical scientists through diluent, mobile phase, and sample preparation

MANUFACTURING EXPERIENCE

Crazy Aaron's Enterprises Norristown, PA
Materials & Process Engineer Co-op *April 2019 to September 2019*
- Tripled production of new product line and served as subject matter expert on business merger
- Authored company-wide lean documentation to reduce defects and to highlight safety precautions
- Trained and supervised 6 operators on new techniques, products, and process improvements

Noramco, Inc. Wilmington, DE
Process Engineering Co-op *September 2016 to August 2017*
- Created 5 startup procedures to improve process efficiency and prevent salt formation
- Contributed to 2 new products by interfacing with operators and developing technical documentation
- Updated and refined batch records for process improvement savings of up to $200,000 per campaign

PEER-REVIEWED JOURNAL PUBLICATIONS

1. **K.Q. Loh**, C. Nieters, N.J. Eylands, V.E. Ferry, U.R. Kortshagen, "Quantum Dot Films for Lettuce Growth Enhancement: A Computational Study," (In Preparation).
2. T. J. Cameron, B. Klause, **K.Q. Loh**, U.R. Kortshagen, "Aluminum-Silica Core-Shell Nanoparticles *via* Nonthermal Plasma Synthesis," (Submitted).
3. **K. Q. Loh**, B. L. Stottrup, "Ten Years of the Science of Food and Cooking Course at Augsburg University," (Submitted).
4. **K.Q. Loh,** K. Harbick, N.J. Eylands, U.R. Kortshagen, V.E. Ferry, "Design Guidelines for Luminescent Solar Concentrator Greenhouses in the United States." *Advanced Sustainable Systems*, 2400749 (2024). DOI: 10.1002/adsu.202400749
5. **K.Q. Loh,** H. P. Andaraarachchi, V.E. Ferry, U.R. Kortshagen, "Photoluminescent Si/SiO_2 Core/shell Quantum Dots Prepared via High-Pressure Water Vapor Annealing for Solar Concentrators, Luminescent Devices, and Bioimaging." *ACS Applied Nano Materials*, 6(7) 6444-6453 (2023). DOI: 10.1021/acsanm.3c01130

PEER-REVIEWED CONFERENCE PROCEEDINGS

1. **K.Q. Loh,** K. Harbick, N.J. Eylands, U.R. Kortshagen, V.E. Ferry, "Luminescent Solar Concentrator Greenhouses for Concurrent Energy Generation and Lettuce Production in the U.S.," *AgriVoltaics World Conference 2024*, Denver, CO, 2024. (Submitted)
2. **K.Q. Loh,** M. Dasgupta, "The Forces of Stage Design: An Interdisciplinary Approach to Teaching Normal Force, Frictional Force, and Design Ethics for non-STEM Majors" *Proceedings of the ASEE Midwest Section Conference*, Lincoln, NE, 2023. DOI: 10.18260/1-2-660.1137-46369

CONFERENCE AND SYMPOSIUM PRESENTATIONS

**Indicates undergraduate research mentee*

1. A. Hoanca*, **K. Q. Loh**, U.R. Kortshagen, V.E. Ferry, (March 2025). *Effects of Greenhouse Building Materials on the Energy Consumption of Cold Climate Solar Greenhouses*. Accepted Poster and Oral Presentations. 2025 SWE Local Conference. Milwaukee, WI.
2. A. Hoanca*, **K.Q. Loh**, U.R. Kortshagen, V.E. Ferry, (December 2024). *Effects of Greenhouse Building Materials on the Energy Consumption of Cold Climate Solar Greenhouses*. Virtual Oral Presentation. Fall 2024 Undergraduate Research Symposium. Minneapolis, MN.
3. **K.Q. Loh,** K. Harbick, N.J. Eylands, U.R. Kortshagen, V.E. Ferry, (June 2024). *Luminescent Solar Concentrator Greenhouses for Concurrent Energy Generation and Lettuce Production in The United States*. Oral Presentation. 2024 AgriVoltaics World Conference. Denver, CO.
4. **K.Q. Loh,** N.J. Eylands, U.R. Kortshagen, V.E. Ferry, (May 2024). *Luminescent Solar Concentrators for Agrivoltaic Greenhouses in the United States.* Oral and Poster Presentations. Industrial Partnership for Research in Interfacial & Materials Engineering. Minneapolis, MN.
5. **K.Q. Loh,** H. P. Andaraarachchi, V.E. Ferry, U.R. Kortshagen, (May 2024). *Photoluminescent Si/SiO_2 Core/shell Quantum Dots Prepared via Plasma Synthesis and High-Pressure Water Vapor Annealing for Solar Concentrators, Luminescent Devices, and Bioimaging*. Poster Presentation. 2024 Dusty Plasma Workshop. Minneapolis, MN.
6. **K.Q. Loh,** K. Harbick, N.J. Eylands, U.R. Kortshagen, V.E. Ferry, (April 2024). *Luminescent Solar Concentrator Greenhouses for Concurrent Energy Generation and Lettuce Production in The United States*. Oral Presentation. 2024 Materials Research Society Spring Meeting & Exhibit. Seattle, WA.
7. **K.Q. Loh,** K. Harbick, N.J. Eylands, U.R. Kortshagen, V.E. Ferry, (April 2024). *Solar-Powered Greenhouses for the Production of Lettuce and Clean Energy in the United States*. Lightning Talk. 2024 UMN Sustainability Symposium. St. Paul, MN. **Received Graduate Student Lightning Talk Award**.
8. **K.Q. Loh,** H.P. Andaraarachchi, U.R. Kortshagen, V.E. Ferry, (September 2023). *Photoluminescent Si/SiO_2 Core/shell Quantum Dots Prepared via High-Pressure Water Vapor Annealing for Solar Concentrators, Luminescent Devices, and Bioimaging*. Student Capsule Presentation. American Vacuum Society (AVS) Minnesota Chapter Symposium, Minneapolis, MN.
9. **K. Q. Loh,** U.R. Kortshagen, V.E. Ferry, (May 2023). *Luminescent Solar Concentration (LSC) Greenhouses: Optimization for Net Zero Energy and Improved Crop Growth*. Poster Presentation. Industrial Partnership for Research in Interfacial & Materials Engineering, Minneapolis, MN.
10. A. Chapa*, **K. Q. Loh,** U.R. Kortshagen, V.E. Ferry, (April 2023). *Improving the dispersion of silicon/silicon dioxide quantum dots.* Poster Presentation. 2023 Materials Research Society Spring Meeting & Exhibit. San Francisco, CA.
11. **K. Q. Loh,** V.E. Ferry, U.R. Kortshagen, (April 2023). *Tunable, high intensity photoluminescence from Si/SiO_2 core/shell quantum dots* via *high-pressure water vapor annealing.* Oral Presentation. 2023 Materials Research Society Spring Meeting & Exhibit. San Francisco, CA.
12. **K. Q. Loh,** U.R. Kortshagen, V.E. Ferry, (June 2022). *Tunable, high intensity photoluminescence from Si/SiO_2 core/shell nanocrystals for LSCs*. Poster Presentation. Industrial Partnership for Research in Interfacial & Materials Engineering, Minneapolis, MN.
13. **K.Q. Loh,** K. Hantanasirisakul, K. Maleski, Y. Gogotsi, J.B. Baxter, (October 2019). *Understanding Time-Dependent Light-Matter Interactions of Mo_2TiC_2 MXene Films.* Poster Presentation. Future Leaders in Chemical Engineering Award Symposium, North Carolina State University, Raleigh, NC. (September 2019). Distinguished Undergraduate Research Workshop, Wayne State University, Detroit, MI.
14. **K.Q. Loh,** M.E. Edley, J.B. Baxter, (February 2018). *SbSI Microrods as a Ferroelectric Solar Cell Absorber Material.* Poster Presentation. SASE Northeast Regional Conference, Stevens Institute of Technology, Jersey City, NJ. **Received 1st Place Prize in Life Sciences Category.** (May 2017). Week of Undergraduate Excellence, Drexel University, Philadelphia, PA. (April 2017) Stanford Research Conference, Stanford University, Stanford, CA. (February 2017). SWE Region E Conference, Syracuse University, Syracuse, NY. **Received 4th Place Prize Overall.** (August 2016). STAR Scholars Summer Showcase, Drexel University, Philadelphia, PA.

HONORS AND AWARDS

University of Minnesota

Graduate Student Lightning Talk Award	April 2024
President's Student Leadership and Service Award	March 2024
Community of Scholars Program (COSP) Travel Grant ($1000)	August 2023
Letters to a Pre-Scientist (LPS) Certificate of Appreciation for Excellent Explanations	July 2023
Chemical Engineering and Materials Science (CEMS) Outstanding Teaching Assistant (TA) Award	May 2023
Council of Graduate Students (COGS) Outstanding TA Award	April 2023
COGS Conference Travel Grant ($650)	April 2023
CEMS Women+ Group Travel Grant ($750)	April 2023
CEMS Outstanding TA Award	October 2021
Society of Women Engineers Outstanding Collegiate Member	September 2021
National Science Foundation Graduate Research Fellowship (3 years, $138,000 total)	March 2021
College of Science and Engineering Fellowship (2 years, $50,000 total)	February 2020

Drexel University

Drexel University College of Engineering (CoE) Undergraduate Commencement Speaker	June 2020
Dean's List (All Terms), Drexel University	September 2015 to June 2020
Drexel University CoE Outstanding Undergraduate Student Award	January 2020
Tau Beta Pi, Engineering Honor Society, Drexel University	December 2019
Chemical and Biological Engineering (CBE) Undergraduate Student Achievement Award	November 2019
CBE Undergraduate Student Service Award	November 2019
Society of Women Engineers Guiding Star Award (1 of 7 nationally)	February 2019
Supernova Undergraduate Research Fellow, Drexel University	September 2017
Society of Women Engineers Future Leader (SWEFL) (1 of 31 internationally)	June 2017
Kappa Theta Epsilon, Co-op Honor Society, Drexel University	June 2017
Frances Velay Fellow (1 of 8 students), Drexel University ($3,500)	June 2016
National Achievement Full Tuition Scholarship (all years)	September 2015

SELECTED VOLUNTEER SERVICE, LEADERSHIP POSITIONS, AND PANEL ENGAGEMENTS

UMN Graduate Student Committee (GSC) – Departmental Advocacy and Resource-Sharing Group
- FY-2020 Cohort Representative — September 2022 to Present

UMN CEMS Women+ Group
- Undergraduate Coordinator (organize one UG/G social event per semester) — July 2022 to August 2024
- General Coordinator (organize one event per semester) — September 2020 to June 2021

UMN Science for All
- Webmaster (sfa.cems.umn.edu) — July 2022 to August 2024
- General Volunteer (volunteer monthly at local middle schools) — July 2021 to Present

UMN Council of Graduate Students (COGS)
- Grant Reviewer (various Fall, Spring, and Summer Cycles) — September 2020 to Present

Letters to a Pre-Scientist
- STEM Pen Pal — July 2022 to Present

UMN President's Emerging Scholars Program Graduate Student Panel
- Panelist — July 2024
- Volunteer — August 2023

Drexel University Velay Fellows Mentorship Series
- Graduate Student Mentor and Panelist — July/August 2021, 2022, 2023, 2024

UMN CEMS Graduate Student Recruitment Weekends
Graduate Life Panel Moderator and Organizer, Airport Travel Coordinator 2021, 2022, 2023, and 2024

CEMS Department Head Search – Graduate Students and Postdoctoral Scholars
Committee Lead November 2023

UMN CEMS Advisor Selection Panel
Moderator September 2021, 2023

UMN CEMS Students Organizing Against Racism (SOAR)
Outreach Team Volunteer and Video Script Writer (Videos 1, 2, and 3) February 2022 to July 2023

UMN CEMS Graduate Fellowship Panel
Panelist representing NSF GRFP September 2021, 2022

Pink Space Theory
STEM Panel Organizer and Fundraiser, Webinar Moderator, and Grant Writer June 2020 to July 2022

ACM-W Women in Tech Symposium
Graduate Student Panelist April 2022

SWE Virtual Congressional Outreach Day
Minnesota Participant and Advocate for STEM Outreach March 2022

CovEducation
AP Calculus, AP English, and Middle School Reading Tutor March 2020 to June 2022

SWE Early Career Professionals Affinity Group "It's OK to Fail" Workshop
Panelist January 2022

UMN Confronting Anti-Asian Racism in CEMS Panel
Graduate Student Panelist April 2021

UMN HeForSWE Webinar
Graduate Student Panelist March 2021

Drexel Introduce a Girl to Engineering Day (~200 community members)
Co-organizer February 2020

Drexel University College of Engineering
Chair of Joint One-Time Undergraduate Faculty Evaluation Committee September 2019 to January 2020
Recruitment and Outreach Assistant June 2018 to June 2020

PROFESSIONAL AFFILIATIONS AND LEADERSHIP POSITIONS

American Institute of Chemical Engineers
Education Division Communications Committee Member and Twitter/X Lead December 2022 to Present
Minority Affairs Committee Communications Team Member and Newsletter Lead April 2020 to July 2021

Materials Research Society (MRS)
Member April 2023 to Present
Symposium Assistant April 2024

Society of Women Engineers (SWE)
Societal
Awards Committee Rising Collegiate Star Award Coordinator August 2023 to Present
Awards Judge (various award cycles) March 2021 to Present
Culture & Heritage Lead for Asian Connections Affinity Group July 2022 to July 2023
Community Lead for Asian Connections Affinity Group February 2020 to July 2022
SWENext High School "Day in the Life" Reporter February 2020 to July 2022

UMN

GradSWE Committee Chair	March 2021 to July 2022

Drexel University

Membership Director	January 2019 to December 2019
President	January 2018 to December 2018
Outreach Director	December 2015 to December 2017

Society of Asian Scientists and Engineers (SASE)

Drexel Chapter Events Coordinator	June 2018 to June 2019
PR Committee Researcher	July 2016 to June 2018

PROFESSIONAL DEVELOPMENT AND CERTIFICATE PROGRAMS

GradSWE Mentorship Program Mentee	October 2020 to Present
Teaching in Globally Diverse Classes Certificate	January 2025
Northeastern Future Faculty Workshop	July 2024
UMN Teaching Faculty Job Preparation Program	July 2024
SWE Neuroinclusion Training Program	June 2024
UMN Teaching for Student Well-being Program	May 2024
UMN Equity and Diversity Certificate	June 2023
UMN Preparing Future Faculty Program	May 2023
The Inclusive STEM Teaching Project	November 2022
UMN Teaching Assistant Professional Development (TAPD) Program	August 2022
Institute on Teaching and Mentoring Participant	April 2021

REFERENCES

Vivian E. Ferry
Associate Professor
George T. Piercy Professor
Department of Chemical Engineering and Materials Science
612/625-7522
veferry@umn.edu
University of Minnesota
Amundson Hall Room 431
421 Washington Avenue SE
Minneapolis, MN 55455

Uwe R. Kortshagen
Ronald L. and Janet A. Christenson Chair of Renewable Energy
Distinguished McKnight University Professor
Professor of Mechanical Engineering
Department of Mechanical Engineering
612/625-4028
korts001@umn.edu
University of Minnesota
Mechanical Engineering Room 2101F
111 Church Street SE
Minneapolis, MN 55455

Moumita Dasgupta
Assistant Professor
Department of Physics
612/330-1109
dasgupta@augsburg.edu
Augsburg University
Hagfors Center Room 133
2211 Riverside Ave.
Minneapolis, MN 55454