

Kristine Q. Loh

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EDUCATION

University of Minnesota – Twin Cities (UMN)

Doctor of Philosophy, Chemical Engineering

National Science Foundation Graduate Research Fellow

College of Science and Engineering Fellow

Tentative Dissertation Title: Nontoxic Nanomaterials for Photovoltaics in the Built Environment

Minneapolis, MN

Anticipated Graduation: June 2025

Cumulative GPA: 3.68

Drexel University, Pennoni Honors Program, Summa Cum Laude

Accelerated Master of Science in Materials Science and Engineering

Thesis Title: Optimization of Photodetection Analysis of MXene Thin Films

Bachelor of Science in Chemical Engineering

Certificate in Technical Communication and Publishing

Philadelphia, PA

June 2020

Cumulative GPA: 3.96

Ruhr-Universität Bochum

Exchange Undergraduate Student in Mechanical Engineering

Bochum, Germany

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
- 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

- 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 the University of Minnesota
- 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 the University of Minnesota

- Andy Chung, *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/SiO₂ 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 Ti₃C₂T_x and Mo₂TiC₂T_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 CuSbS₂ 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.

R&D Analytical Chemistry Co-op

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

Fort Washington, PA

September 2017 to March 2018

MANUFACTURING EXPERIENCE

Crazy Aaron's Enterprises

Materials & Process Engineer Co-op

Norristown, PA

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.

Process Engineering Co-op

Wilmington, DE

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**, K. Harbick, N.J. Eylands, U.R. Kortshagen, V.E. Ferry "Design Guidelines for Luminescent Solar Concentrator Greenhouses in the United States," (Submitted).
2. **K.Q. Loh**, H. P. Andaraarachchi, V.E. Ferry, U.R. Kortshagen, "Photoluminescent Si/SiO₂ 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](https://doi.org/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](https://doi.org/10.18260/1-2-660.1137-46369)

CONFERENCE AND SYMPOSIUM PRESENTATIONS

**Indicates undergraduate research mentee*

1. **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.

2. **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.
3. **K.Q. Loh**, H. P. Andaraarachchi, V.E. Ferry, U.R. Kortshagen, (May 2024). *Photoluminescent Si/SiO₂ 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.
4. **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.
5. **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.**
6. **K.Q. Loh**, H.P. Andaraarachchi, U.R. Kortshagen, V.E. Ferry, (September 2023). *Photoluminescent Si/SiO₂ 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.
7. **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.
8. 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.
9. **K. Q. Loh**, V.E. Ferry, U.R. Kortshagen, (April 2023). *Tunable, high intensity photoluminescence from Si/SiO₂ core/shell quantum dots via high-pressure water vapor annealing*. Oral Presentation. 2023 Materials Research Society Spring Meeting & Exhibit. San Francisco, CA.
10. **K. Q. Loh**, U.R. Kortshagen, V.E. Ferry, (June 2022). *Tunable, high intensity photoluminescence from Si/SiO₂ core/shell nanocrystals for LSCs*. Poster Presentation. Industrial Partnership for Research in Interfacial & Materials Engineering, Minneapolis, MN.
11. **K.Q. Loh**, K. Hantanasirisakul, K. Maleski, Y. Gogotsi, J.B. Baxter, (October 2019). *Understanding Time-Dependent Light-Matter Interactions of Mo₂TiC₂ 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.
12. **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 ATP-BIO High School Summer Program Plasma Lab Tour Guide	June 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
Coalition of Asian American Leaders (CAAL) Asian Minnesotans at the Capitol Day Participant and Advocate for Ethnic Studies in Minnesota Schools	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 Recruitment and Outreach Assistant	September 2019 to January 2020 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
PR Committee Researcher

June 2018 to June 2019
July 2016 to June 2018

PROFESSIONAL DEVELOPMENT AND CERTIFICATE PROGRAMS

GradSWE Mentorship Program Mentee	October 2020 to Present
Northeastern Future Faculty Workshop	July 2024
Teaching Faculty Job Preparation Program	July 2024
Teaching in Globally Diverse Classes Certificate	In Progress (50%)
SWE Neuroinclusion Training Program	June 2024
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
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