Sukanya Dutta

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Summary

- Physical chemistry Ph.D. student specializing in plasmonic photoelectrochemistry, and nanofabrication.
- Strong experimental background in optics, electrochemistry, and lithography.
- Extensive leadership experience in the planning of new chemistry lab spaces and enforcement of safety protocols.

Education

Ph.D. Physical Chemistry *Exp. May 2026*
University of Illinois Urbana-Champaign, IL, USA GPA 4.00 / 4.00

M.A. Chemistry *Jul 2023*
Rice University, TX, USA GPA 3.94 / 4.00
D.J. Evans Atwell–Welch Graduate Fellowship

M.S. Chemistry *Jul 2021*
IISER Mohali, India GPA 9.64 / 10.00
Award of Academic Excellence

B.Sc. (Hons) Chemistry *Jun 2017*
St Xavier's College, Kolkata India 79.4 %
Qualified INSPIRE Fellowship (top 1 %)

Experience

Research Assistant *Jan 2022 – Present*
Link Lab, Rice University & University of Illinois Urbana-Champaign

- **Plasmon damping in bimetallic nanoparticles (2025 - Present):**
  - Fabricate and characterize bimetallic nanoparticles using polymer pen lithography (TERA-print) to study plasmon damping.
- **Plasmon Generated Solvated Electrons (2022 - Present):**
  - Investigate the role of coupled gold plasmon modes with high electric fields for solvated electron generation in organic solvents.
  - Establish the mechanism of plasmon generated solvated electron mediated degradation of waste water contaminants under electrochemical bias.

Mentorship *2022 – 2026*
Rice University & University of Illinois Urbana-Champaign

- Mentored undergraduate student on the plasmon-enhanced solvated electron generation research project in Prof. Stephan Link's lab, University of Illinois Urbana-Champaign.
- Volunteered in the undergraduate mentoring program offered by the Chemistry department at Rice to help struggling students improve their academic success.

Teaching Assistant *Aug 2021 – Dec 2022*
Department of Chemistry, Rice University

- Facilitated and graded experiments for undergraduate general chemistry laboratory courses.

MS Researcher *May 2019 – Jul 2021*
Pal Lab, IISER Mohali

- Studied self-assembly of non-ionic surfactants at liquid crystal–water interfaces for drug delivery applications using polarized optical microscopy.

Teaching Assistant *Aug 2020 – Apr 2021*
Department of Chemistry, IISER Mohali

- Supervised undergraduate chemistry laboratory sessions.

Publications

- **Dutta, S.**; Kim, JM.; Landes, C. F.; Link, S. Plasmon Damping Pathways in Bimetallic Nanoparticles Synthesized using Scanning Probe Block Copolymer Lithography., in preparation.
- Adhikari, S.; **Dutta, S.**; Gomez, E.; Yuan, T.; Link, S. Understanding the Interband vs Intraband Photoluminescence Mechanism of Metal Nanoparticles using Time-resolved Upconversion Microscopy., in preparation.
- Zhou, S.; Hazin, G.; **Dutta, S.**; Link, S.; Rodríguez-López, J.; Murphy, C. Role of plasmon enhnacement in alloy nanoparticle mediated electrochemical CO_2 reduction reaction., in preparation.
- **Dutta, S.**; Hu, K.; Kim, JM.; Kim, JH.; Landes, C. F.; Link, S. Photoemission Mediated Waste Water Contaminant Degradation Using Visible Light., in preparation.
- **Dutta, S.**; Adhikari, S.; Yoo, J.; Kim, JH.; Al-Zubeidi, A.; Landes, C. F.; Link, S. Solvated Electron Generation from Coupled Plasmon Modes of Gold using Visible Light. *Nano Lett.*, submitted.
- Al-Zubeidi, A.; Ostovar, B.; Carlin, C. C.; Li, B. C.; Lee, S. A.; Chiang, W.-Y.; Gross, N.; **Dutta, S.**; Misiura, A.; Searles, E. K.; Chakraborty, A.; Roberts, S. T.; Dionne, J. A.; Rossky, P. J.; Landes, C. F.; Link, S. Mechanism for Plasmon-Generated Solvated Electrons. *Proc. Natl. Acad. Sci. U.S.A.* **2023**, *120* (3).
- Pani, I.; Nailwal, Y.; **Dutta, S.**; Pal, S. K. Tailoring Liquid Crystals as Vehicles for Encapsulation and Enzyme-Triggered Release. *J. Mater. Chem. B* **2022**, *10* (16), 3032–3038.

Skills

Languages
MATLAB, Python, FORTRAN 77, LaTeX

Software
Blender, Lumerical FDTD, Gnuplot, ChemDraw, Origin, ImageJ, Gaussian 09

Instrumentation

- **Optical tools:** Hyperspectral dark-field microscope; ultraviolet–visible (UV-Vis) absorption spectrometer (solution and solid samples); spectrofluorometer; circular dichroism (CD) spectrophotometer; polarized optical microscope (POM); attenuated total reflection fourier transform infrared spectrometer (ATR-FTIR).
- **Electrochemical tools:** Bulk and single-particle electrochemical cells; electrochemical techniques – voltammetry (CV, LSV), chronoamperometry, electrochemical impedance spectroscopy (EIS).
- **Fabrication tools:** Polymer pen lithography (TERA-print); thin film deposition tools - electron-beam evaporator, sputter coater, and atomic layer deposition (ALD); Langmuir–Blodgett trough.
- **Characterization tools:** Electron microscopy – scanning (SEM), transmission (TEM), elemental mapping (EDS); atomic force microscopy (AFM); dynamic light scattering (DLS); nuclear magnetic resonance spectrometer (NMR); liquid chromatography mass spectrometry (LC-MS); high performance liquid chromatography (HPLC).

Leadership and Organizational Experience

Lab Safety Officer (LSO) *2024 – Present*
Link Lab, University of Illinois Urbana-Champaign

- Serve as the liaison between faculty advisor, group members, and campus safety offices.
- Received **ACS Recognition of Excellence, Fall 2024** for leadership in promoting Research Safety.

Women Chemists Committee (WCC) Board Member *2024 – 2026*
ACS East Central Illinois Local Section, University of Illinois Urbana-Champaign

- **Vice Chair (2025 – 2026):** Supported organizational leadership, professional development programs, and serve as liaison to the ACS local chapter.
- **Invited Speaker Co-Chair (2024 – 2025):** Coordinated invited speaker seminar series, alumni outreach, and cross-organization events, including logistics and speaker engagement.
- WCC received **2025 ChemLuminary Award for Most Outstanding Local Section Women Chemists Committee** during the term I served as active board member.

Professional Leadership Coaching *2022 – 2023*
Doerr Institute for New Leaders, Rice University

- Served as the **Graduate Student Ambassador** at Doerr Institute for the Fall 2023 term.

- Worked one-on-one with International Coaching Federation (ICF) certified coaches to identify and develop leadership skills, including personal growth and conflict resolution.
- Participated in intensive leadership development programs involving working one-on-one with ICF certified coaches, attending workshops (decision-making, conflict management, and delivering constructive feedback), and team leadership training.

Treasurer & STRIVE Liaison *2021 – 2023*
Graduate STRIVE: Students Transforming Rice Into a Violence-Free Environment,
Rice University

- Hosted prevention activities and supported graduate students by providing information about resources available on and off campus.

Member *2024 - Present*
Iota Sigma Pi, Chicago Chapter

Member *2021 - Present*
American Chemical Society

Achievements and Awards

Travel Award *Jun 2025*
Women Chemists Committee (WCC), University of Illinois Urbana-Champaign
GRC Plasmonically Powered Processes 2025, Ventura, CA

Recognition of Excellence for Leadership in Promoting Research Safety *Aug 2024*
American Chemical Society
ACS Fall 2024, Denver, CO

Travel Award *Aug 2023*
Department of Chemistry, Rice University
ACS Fall 2023, San Francisco, CA

D. J. Evans Atwell-Welch Graduate Fellowship *Aug 2021*
Rice University

Award of Academic Excellence *Apr 2020*
IISER Mohali

DESY Ultrafast X-Ray Summer-School Travel Grant *Jun 2019*
DESY, Hamburg

Institute Fellowship (Integrated Ph.D.) *2017–2020*
IISER Mohali

Qualified INSPIRE Fellowship (top 1 %) *Aug 2015*
Department of Science & Technology (DST), India

16th State Rank (WBCHSE Higher Secondary) *2015*
District topper among girls

Workshops and Conferences Attended

Gordon Research Conferences (GRC): Plasmonically Powered Processes *2025*
Ventura, CA

- Oral and poster presentation: **lvated Electron Generation from Coupled Plasmon Modes of Gold using Visible Light.**

Changwoo Park - Walter Klemperer Inorganic and Materials Chemistry Allerton Conference (PK-IMAC) *2024*
University of Illinois Urbana-Champaign

- Oral presentation: **Mechanism for plasmon-generated solvated electrons.**

77th International Symposium on Molecular Spectroscopy (ISMS) *2024*
University of Illinois Urbana-Champaign

- Oral presentation: **Effect of plasmon excitation on surface versus bulk emission of solvated electrons into water.**

10th International Conference on Surface Plasmon Photonics (SPP10) *2023*
Rice University

- Poster presentation: **Effect of plasmon excitation on surface versus bulk emission of solvated electrons into water.**

ACS Fall 2023: Harnessing the Power of Data *2023*
San Francisco, CA

- Poster presentation: **Effect of plasmon excitation on surface versus bulk emission of solvated electrons into water.**

ComSciCon Houston *2023*
Rice University

Welch Conference on Chemical Research *2022*
The Welch Foundation

ComSciCon Houston *2022*
Rice University

- Delivered an elevator pitch on current research and participated in a write-a-thon peer review session.

CRIKC Chemistry Symposium *2019*
IISER Mohali

26^{th} **National Conference on Liquid Crystals (NCLC)** *2019*
Chitkara University, Punjab

Ultrafast X-Ray Summer School (UXSS) *2019*
DESY, Hamburg

- Poster presentation: **Probing ultrafast photodynamics involving H-transfer using hard X-ray elastic and inelastic scattering.**

Augmenting Writing Skills for Articulating Research (AWSAR) *2018*
IISER Mohali

International Seminar on Chemistry and Its Relevance to Environmental Biology (CREB) *2018*
St Xavier's College, Kolkata (Autonomous)

National Symposium on Facets of Chemistry in Materials & Biology (FOCMB) *2018*
St Xavier's College, Kolkata (Autonomous)

- Awarded 3^{rd} position for a poster presentation on **Adaptive Random Mutation Hill Climbing.**

Asian Meeting on Metal Oxide Assemblies (AMMOA) - GIAN 2017 *2017*
IISER Kolkata

International Symposium on Facets of Chemistry in Biology (FOCB) *2017*
St Xavier's College, Kolkata (Autonomous)

National Symposium on Facets of Chemistry in Biology (FOCB) *2016*
St Xavier's College, Kolkata (Autonomous)