

KARAN KOTAK

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EDUCATION

Georgia Institute of Technology, Atlanta GA

January 2021 – December 2023

BS in Chemical & Biomolecular Engineering | GPA: 3.91/4.00 | Faculty Honors x4, Dean's List x2

WORK EXPERIENCE

Georgia Institute of Technology, Atlanta GA

June 2023 – December 2023

Course Design Assistant

- Designed the Numerical Methods section of the Thermodynamics Course (ChBE 2140) using MATLAB, Aspen Plus & MS Excel to help students excel in the course.
- Coordinated with professors to discuss the logistics and the relevance of Numerical Methods in the course.

Georgia Institute of Technology, Atlanta GA

August 2022 – December 2023

Undergraduate Research Assistant

- Developed hollow CMS Membranes from Matrimid precursor and Vinyltrimethoxysilane (VTMS) through pyrolysis to enhance permeance and selectivity of the membranes for efficient gas separations.
- Performed pure gas permeation testing of Matrimid CMS membranes using CO₂ and CH₄ gas at set temperatures and high pressures to analyze its productivity.
- Conducted safety disposal of chemicals and polymer solutions in accordance with EHS guidelines to prevent safety hazards.

Indian Institute of Technology Bombay, Mumbai, India

May 2022 – July 2022

Research Intern

- Investigated the acidic strength of the solid acid catalysts, Amberlyst and Nafion using quantum chemical modeling to explain the disparity observed in their catalytic activities during strength-sensitive reactions.
- Combined NMR/DFT hybrid approach of the absorbed probe molecule TMPO to determine the 31P chemical shift for liquid inorganic acids and solid acid catalysts.

Georgia Institute of Technology, Atlanta GA

August 2021 – December 2023

Undergraduate Teaching Assistant

- Assisted transfer students to get accustomed to the college environment and introductory chemical engineering courses through recitation sessions.
- Evaluated HW's and helped students with concepts related to Material & Energy Balances (ChBE 2801) and Transport Phenomena (ChBE 3210) resulted in improved learning outcomes.

Himadri Specialty Chemicals Ltd., India

June 2021 – July 2021

Student Trainee

- Analyzed the unit operations in the manufacturing of High & Low-Grade Carbon Black by performing material and energy balances.
- Applied industrial quality control methods like the Pellet Size Distribution Test and Iodine Surface Area Adsorption to analyze surface chemistry and morphology of the carbon black aggregates.

PROJECTS/AWARDS/CERTIFICATIONS

- *Recipient of the Thomas Gossage International Student Enrichment Scholarship* August 2023
- *Won the 2nd Prize for the ChBE Capstone Design Project by ChBE at Georgia Tech & Shell Corporation* July 2023
- *Exploring H₂ as an alternative fuel source using LOHCs, ChBE Capstone Design* May 2023 – July 2023
- *Outstanding Undergraduate Teaching Assistant (ChBE) by Center for Teaching & Learning (CTL)* April 2023
- *Production of Cyclohexane, Senior Design I* January 2023 – April 2023
- *AIChE Safety & Chemical Engineering Certification: Process Safety & Hazard Analysis* June 2021

CONFERENCES

Outreach Symposium on Molecular Simulations: Advances & Applications, IIT Bombay

June 2023

Goutam Narayan Tumulu, **Karan Kotak**, et al. 31P NMR Chemical Shift of Phosphine Oxide as an Acid Strength Descriptor for Liquid Inorganic Acids.

EXTRA-CURRICULARS/LEADERSHIP

Peer-Mentor ChBE, Atlanta, GA, USA (Aug 2023-Dec 2023)

- Mentoring freshman ChBE students regarding courses, registration, getting involved, leadership opportunities, preparedness, etc.

Diversity, Equity & Inclusion (DEI) Committee, Atlanta, GA, USA (Oct 2022-May 2023)

- Promoted DEI in the school of Chemical Engineering through events such as Diversity Round Table Talks.

Peer-Led Help Desk (PLHD), Atlanta, GA, USA (Aug 2022-Dec 2023)

- Guiding ChBE students regarding courses, registration, getting involved, leadership opportunities, preparedness, etc.

AIChE at Georgia Tech, Catering Committee, Atlanta, GA, USA (Aug 2022-May 2023)

- Assisted the treasurer with catering during career fairs, Lunch & Learns and other AIChE Chapter Events.

FASET Transfer Student Panel, Atlanta, GA, USA (Jul 2021, Jan 2022)

- Guided new transfer students regarding courses, registration, getting involved, preparedness, etc. through personal experience.

SKILLS

MATLAB, Aspen Plus, SolidWorks, LabView, Gaussian 16, GaussView 6, High Performance Computing (HPC), Applied Spectroscopy, Organic Synthesis, Gas Chromatography, Statistical Analysis, Engineering Drawings, MS Office