

BENIAM KUMELA

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EDUCATION

The University of Texas at Austin Bachelor of Science, Chemical Engineering (Honors) May 2025
Certificate: Computational Science and Engineering
Overall GPA: 3.95

Relevant Coursework: Quantum Chemistry and Spectroscopy, Transport Phenomena, Thermodynamics, Transport Processes, Chemical Engineering Materials, Computational Chemistry, Numerical Methods, Optimization: Theory and Practice.

EXPERIENCE

Wang Materials Group | University of Texas at Austin – *Undergraduate Researcher*; Austin, TX Spring 2024

- Studied point defects in 2D materials using Density Functional Theory (DFT) for next generation memory technology. Presented findings at undergraduate research poster competition.
- Currently studying heterostructures for photocatalytic water splitting using DFT.

Motiva Enterprises LLC – *Process Engineering Intern*; Houston, TX Summer 2023
Summer 2023 – Houston, TX

- Developed process simulation for refinery's amine system with a real-time data tool for unit monitoring and troubleshooting.
- Identified potential multi-million-dollar annual savings through energy optimization scenarios.
- Developed an automated Fluid Catalytic Cracking Unit (FCCU) profit tracker for performance monitoring and market-informed decision making.
- Converged process simulations for sour water stripper project.

Halas Labs | Rice University – *Undergraduate Researcher*; Houston, TX Summer 2021, 2022
Summer 2022

- Assembled samples for surface-enhanced Raman spectroscopy (SERS) through production and structural analysis of nanoparticle and nano shell substrate.
- Collected 200+ SERS to train ML model to detect polycyclic aromatic hydrocarbons (PAHs).
- Designed poster which got earned best design in competition. Featured on publication of this project.

Summer 2021

- Calibrated peristaltic pumps using Excel by graphing corresponding volumetric flow rates.
- Constructed solar desalination system using a carbon black nanoparticle surface for increased thermal conductivity.
- Ran trials for caliche rock remineralization as a possible supplement to water filtration above.
- Performed chemical analysis and designed poster with team which won first place in design.

PAPERS

“Surface-Enhanced Raman Spectroscopy: from the Few-Analyte Limit to Hot-Spot Saturation”, *Journal of Physical Chemistry C* (2024).

SKILLS

- Python, MATLAB, Mathematica, Quantum Espresso, VASP, Bash, C++

ACTIVITIES

- Mechanical Design Team Lead for AIChE Chem-E Car, work as fuel grain engineer for LRA (Longhorn Rocketry Association), OXE member (Chemical Engineering Honor Society).