Younos Hashem

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EDUCATION

Georgia Institute of Technology Atlanta, GA
B.S. in Physics May 2026 (expected)
GPA: 4.0 (in progress)

RESEARCH EXPERIENCE

Georgia Institute of Technology Atlanta, GA
Undergraduate Research Assistant September 2024 – Present
Advisor: Dr. Jesse McDaniel

- Developed a Python package to perform QM/MM calculations on covalently bonded systems with 1000s of atoms.
- Investigated behavior of silica–water interfaces using quantum mechanical and molecular dynamics computational methods in a high-performance computing environment.
- Analyzed data to turn simulation results into knowledge of surface chemistry.
- Performed extensive literature searches to understand and model the complex electrostatics of periodic systems.

Georgia Institute of Technology, Quantum Computing Association Atlanta, GA
Project Developer September 2025 – Present

- Implemented decomposition of multi–logical qubit states based on fast Walsh–Hadamard transform.
- Studied representations of logical quantum states with error correction.

Kennesaw State University Kennesaw, GA
Undergraduate Research Assistant May – August 2023
Advisor: Dr. Martina Kaledin

- Co-authored a paper on potential energy surface fitting. Paper was published in the *Journal of Chemical Theory and Computation*.
- Took lead of a group of three students on a project involving the theoretical study of peptide isomers.
- Characterized by computational methods the potential energy surface of formamide and its isomers.

Kennesaw State University Kennesaw, GA
Research Assistant, First-Year Scholars Program October 2022 – April 2023
Advisor: Dr. Jeremy Gulley

- Ran numerical simulations for a work on laser-induced damage to nanoscale semiconductors.
- Developed simplified numerical models as proof-of-concept.

TEACHING EXPERIENCE

Georgia Institute of Technology Atlanta, GA
Teaching Assistant: Principles of Physics II, Optics, Linear Algebra Spring 2025
Led student problem-solving sessions, delivered lectures, and worked with students one-on-one

PUBLICATIONS

"Fitting Potential Energy Surfaces by Learning the Charge Density Matrix with Permutationally Invariant Polynomials". Y. Hashem, K. Foust, M. Kaledin, A. Kaledin, *J. Chem. Theory Comput.* 2023, 19, 17, 5690–5700.

PAPERS UNDER REVIEW

"LogicalQ: A toolkit for quantum circuit development with generalized quantum error mitigation, detection, and correction". R. Devkota, B. Hagan, N. Heffner, Y. Hashem, N. Song, A. Deshpande, F. Makinde, R. Yu, A. Petrusinskaia, Z. Song, D. Lloyd George, L. Lampert, *JOSS* (under review).

AWARDS AND GRANTS

President's Undergraduate Research Award Summer 2025, Spring 2026
Research grant ($3,500)

RESEARCH PRESENTATIONS

"Damage to Nanoscale Semiconductor Wires from Ultrashort Laser Pulses" April 2023
KSU Undergraduate Research Symposium
Advisor: Dr. Jeremy Gulley

SKILLS

Programming	Python (advanced), Java (intermediate), FORTRAN (novice)
Simulation codes	Psi4, VASP, OpenMM
Computational tools	Git, Slurm, Bash

LEADERSHIP EXPERIENCE

Society of Physics Students, Georgia Tech Chapter Atlanta, GA
Treasurer May 2025 – Present

Managed budget and billing process worth $1000s of dollars per semester for an organization with dozens of members. Planned events with 100+ attendees to raise hundreds of dollars.