Emory Hill

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Education

Georgia Institute of Technology — Atlanta, GA

B.S. Aerospace Engineering — BS/MS Honors Program (GPA: 3.85/4.00) — *Dec. 2027*

- Accelerated Master's Track in Aerospace Engineering
- Relevant Coursework: Aerodynamics, Jet & Rocket Propulsion, Compressible Flow, Thermodynamics & Fluid Fundamentals, System Dynamics, Differential Equations

Experience

Ben T. Zinn Combustion Lab — Atlanta, GA

Undergraduate Researcher — *Aug. 2026 – Present*

- Modifying a high-pressure combustion vessel to integrate **PIV diagnostics** for capturing combustion acoustics in an **RQL-style combustor** with real front-end engine hardware.
- Supporting experimental setup, instrumentation, reacting-flow testing, and data analysis for **engine-relevant combustion research**.

Fabritek Aerospace Manufacturing (AS9100) — Winchester, VA

Aerospace Manufacturing Intern — *May 2026 – August 2026*

- Inspected **$2M+** worth of safety-critical engine and airframe components using metrology tools and CMM; caught a defect early in a **2,400-piece**, **$50k** order, preventing **$45,760** in scrap/rework across **2,200** remaining parts.
- Redesigned laser-engraving fixture to process **6×** more components per cycle, reducing operator time **67%** and increasing throughput **32%** across **$800k+** worth of serialized components.
- Managed a customer-facing machining project (±**0.001 in** tolerances), producing CAD models, STEP/DXF files, engineering drawings, and travelers; delivered the full job **one week early**.

Georgia Tech Propulsive Landers — Atlanta, GA

Structures Engineer — *Aug. 2024 – Present*

- Iterated through **4** concepts and **5+** design versions for a **70 kg** rocket landing gear, reducing mass **24%** (3.46→2.63 kg) and cost **9%**, validated through FEA stress analysis.
- Developed TPU honeycomb footpads, printing **20+** prototypes and increasing energy absorption **5.2×** (3.8→20 kJ) via Instron testing and MATLAB stress–strain analysis.
- Collaborated with propulsion and avionics teams to incorporate a **15°** TVC pitch requirement, determining minimum leg angle and structural safety factors.

Projects

CFD Nozzle Flow Optimization | *ANSYS Fluent, MATLAB* — May 2026 – Present

- Conducting mesh-independence study across **3** meshes; optimized farfield biasing to reduce cell count **44%** (1.8M→1.0M) and cut iteration count **50%** (100k→50k), halving runtime.
- Simulating **6** nozzle geometries and a **6×3** test matrix (linear/bell contours across **3** ambient pressures), achieving exit Mach **3–4.5** using structured quadrilateral meshes.
- Automating Fluent post-processing in MATLAB to generate plots/tables; designing **3** additional optimized nozzles (data-based + theory-based) for thrust/efficiency comparison in final report.

AIAA Research Paper — Sloshing Nitrous Oxide | *ANSYS Fluent* — Oct. 2024 – Apr. 2025

- Simulated **9** baffle geometries (1–37 perforations), identifying optimal **7–13** hole range and improving damping ratio **59%** (0.536→0.852) for hybrid-rocket slosh mitigation.
- Performed steady-state Fluent analysis and validated simulation setup against theory; results will inform future GTPL hybrid-rocket baffle design.

Technical Skills

CFD & Simulation: ANSYS Fluent, ANSYS Meshing, ANSYS SpaceClaim, ANSYS Workbench, SolidWorks Simulation (FEA), MATLAB (ODE modeling, automation)
CAD & Design: SolidWorks (CSWP), Fusion360, Engineering Drawing (GD&T)
Programming & Data: MATLAB scripting, Python, Java, Excel
Manufacturing & Inspection: CMM inspection, laser engraving, machining process oversight, job travelers/documentation