Ella Simmons

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Education

Mechanical and Aerospace Engineering, Princeton University *Aug 2023 – May 2027* Princeton, NJ

- Cumulative Unweighted GPA: 3.55
- Relevant Coursework: Origami Engineering, Lightweight Structures, Experimental Physics, Small Spaceflight Hardware, Thermodynamics, Statics, Differential Equations, Dynamics, Controls, Materials, Circuit Design

Research

Undergraduate Researcher, Princeton University *Feb 2026 – Present* Princeton, NJ

- Conducting independent work and senior thesis research with Professors Glaucio Paulino and Howard Stone on deployable heat fins based on the Kresling origami unit cell.
- Designed and fabricated fully parameterized Fusion 360 models and an instrumented thermocouple-based experimental apparatus. Conducted thermocouple-based heat-transfer experiments comparing expanded and collapsed configurations, fin materials, and forced and natural convection; demonstrated improved cooling from expanded cells over a collapsed control.
- Continuing the work as a senior thesis by integrating nitinol shape-memory alloys for passive deployment, developing ANSYS thermal simulations, and scaling individual cells into deployable heat-fin matrices.

Employment History

Test & Integration Intern, Rocket Lab *May 2026 – Present* Long Beach

- Designed and built an automated torque rod test system, integrating Siemens NX, Altium PCB design, embedded software, and custom test hardware.
- Supported spacecraft integration testing by commanding flight hardware using custom developed software and Linux, analyzing telemetry, and troubleshooting electrical systems using laboratory instrumentation.
- Designed and built MGSE for Thermal Cycle Testing (TCT), including a thermocouple breakout box and multi-point chamber temperature measurement system.
- Coordinated the first TCT campaign by developing test plans, configuring thermal infrastructure, integrating a spacecraft mass model, and installing thermal instrumentation.

Additive Manufacturing Hardware Intern, Divergent 3D *May 2025 – Aug 2025* Los Angeles, CA

All projects conducted were for Divergent's proprietary laser powder bed fusion (LPBF) metal 3D printer.

- Redesigned and simplified chamber machined components resulting in $1,500+ saved per machine.
- Finalized design, lead design reviews, and released via ECO several subsystems of a LPBF printer, including the fluid distribution for the second iteration of machine.
- Investigated Teamcenter PLM mBOM functionality and limitations, created user guides, and recommendations for future implementation.
- Designed optical scanner installation tooling, improving cost ($2000/printer) and usability.
- Evaluated existing prototype system for the passivization of LPBF reactive soot waste. Designed improvements to system to automate the passivization process and reduce the cost of waste disposal.

Data Analyst Intern, Eagle Creek Renewable Energy *Jun 2024 – Sept 2024* Bethesda, MD

Developed Python software to assess financial impacts of hydroelectric plant upgrades and restorations, deployed company-wide. The software:

- Aggregated historical generation, flow data from API and power pricing to calculate power and monetary output for hydroelectric plants, which allowed optimized timing of unit upgrades.
- Created a dashboard for visualizing power, flow, and pricing data.

Electrical Engineering Research Intern, Duke Quantum Center *Jul 2022 – Sept 2023* Durham, NC

- Optimized the power output of an infrared laser going into a wavemeter and locking system.
- Designed, built and tested five PCBs that are implemented in the quantum computing systems.

Extra-Curricular and Leadership Activities

Princeton Racing Electric, Formula SAE Electric *Aug 2023 – Present* Princeton, NJ

Team Principal May 2026 – Present

- Manage all team logistics, project management efforts and represent the team.

Mechanical Chief Engineer August 2025 – May 2026

- Administrative oversight of all mechanical projects and sub teams. Developed and led full team project management initiative.

Aerodynamics Lead August 2024 – May 2026

- Leading the development and implementation of Princeton Racing Electric's first aero package, including the design, optimization, and manufacturing of fully carbon fiber bodywork.

Princeton University Robotics Club *Jan 2024 – Present* Princeton, NJ

Electrical and Integration Lead, WALL-E Team August 2024 – Present

- Leading project management & arm mechanism development for a movie-accurate WALL-E robot.
- Overseeing the integration of mechanical and electrical systems to ensure seamless functionality.

Droid Team Member August 2023 – June 2024

Makerspace Circulation Assistant, Princeton University *Feb 2025 – Present* Princeton, NJ

- Support undergraduate and graduate students, faculty, and staff with makerspace projects and tools for four hours per week; train users in safe operation of 3D printers and sewing machines.

Skills/Licenses

CAD, Design & Fabrication	NX, Solidworks, Fusion, Autodesk Inventor, Onshape, Machining, Welding, CAM, 3D Printing
Electronics & Software	Electronics, Altium, KiCAD, PCB, Python, Java

Hobbies

Aviation (Pilot's License), astrophysics, motorsports, Brazilian Ju Jitsu, reading, origami