

# Alexander J. Barry

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## Education

### Cornell University, College of Engineering

Major: Bachelor of Science in Mechanical Engineering

GPA: 4.10

Ithaca, NY

Expected Graduation: May 2027

## Skills

- CAD (Fusion 360, SolidWorks, Creo, Onshape), Engineering Drawings, MATLAB, Python, Data Analysis, Prompt Engineering
- Mechanical Testing (Instron Testing, DMA, DSC, TGA, SFPO), SEM imaging, MicroCT, ImageJ, Microsoft Office

**Relevant Coursework:** Statics, Thermodynamics, Dynamics, Mechanical Design, Fluid Dynamics, Mechanics of Materials, System Dynamics, Waves and Quantum Physics, Lasers and Photonics, Multivariable Calculus, Differential Equations, Linear Algebra, Statistics

## Work Experience

### Center for Composite Materials, University of Delaware

Intern; Supervisor: Sai Aditya Pradeep

Newark, DE

May 2025 – August 2025

- Characterized effect of modifying cooling rates on interfacial shear strength of fiber reinforced thermoplastic polyolefins
- Developed and standardized a method to rapidly fabricate and test Single Fiber Pull-out Test specimens
- Awarded 1<sup>st</sup> place in the Undergraduate Summer Research Symposium

### Center for Composite Materials, University of Delaware

Intern; Supervisor: Dr. John W. Gillespie Jr.

Newark, DE

June 2022 – August 2024

- Reduced coefficient of thermal expansion mismatch & analyzed failure modes in Cu/polyimide bonds
- Characterized and resolved cause of void defects in TuFF carbon fiber panels, improving tensile properties by over 10%
- Validated new material model MAT213 through experimental testing, resulting in improved simulation credibility
- Designed testing methods for difficult to measure material properties, validating the material simulation model MAT213

## Extracurricular Activities

### Cornell University Autonomous Drone Project Team

Mechanical Engineer

Ithaca, NY

January 2025 – Present

- Developed and manufactured a 5” propeller quadcopter with CAD prototyping, 3D printing, CNC machined carbon fiber
- Produced 1m-long glider ducted-fan drone in CAD, designed for calculated aerodynamic properties required for lift

### Applied Turbulence Research Laboratory

Undergraduate Research Assistant, Supervisor: Prof. Gregory Benley

Ithaca, NY

September 2024 – Present

- Implemented and developed code using PID controls for real-time autonomous quadcopter control
- Compiled and analyzed flight path data to tune the system and achieve stable equilibrium in a wind tunnel

## References

### Publication: CCM Research

January 2024

S. M. Doshi, A. Barry, *et al.*, “Adhesion Characterization and Enhancement between Polyimide-Silica Composite and Nodulated Copper for Applications in Next-Generation Microelectronics,” *ACS Applied Materials & Interfaces*, vol. 16, no. 2, pp. 2692–2703, Jan. 2024, doi: 10.1021/acsami.3c14434. - <https://pubs.acs.org/doi/10.1021/acsami.3c14434>

- Made improvements to Cu/Polyimide adhesion properties by modifying processing parameters and silica content.