

MATTHEW RICCHIUTI

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Education

New York University

B.S. Mechanical Engineering — GPA: 3.963/4.0

May 2026

New York, NY

Relevant Coursework: Finite Element Modeling and Analysis, Fluids, Heat Transfer, Compressible Flow

Experience

NYU Rogue Aerospace

Aerostructures Lead

Jan. 2024 – May 2026

Brooklyn, NY

- Led a 12-member team designing and fabricating structural components for NYU's first hybrid propellant launch vehicle
- Developed NYU's first SRAD fiberglass composite airframe through iterative design, manufacturing, and testing process
- Reduced total weight of airframe components by 30% and cost by 60% as compared to COTS alternatives
- Performed tap testing and visual inspection on fiberglass composite panels to identify delaminations and voids introduced during the wet layup process, correlating defects with deviations in layup process
- Designed custom aluminum structural system with longerons connecting oxidizer tank to combustion chamber, performing FEA and compression testing to achieve safety factor of 3 under peak acceleration loading of 12 Gs
- Machined longerons on manual mill, achieving 30% increase in strength-to-weight ratio through selective mass reduction
- Used Autodesk Fusion CAM to program Tormach 770 CNC mill for in-house manufacturing of oxidizer tank bulkheads
- Used SolidWorks to create and manage CAD assembly of the entire 2025-2026 competition launch vehicle

Projects

Bipropellant Liquid Rocket Engine

Apr. 2026 - Present

- Developed a 150 lbf nitrous oxide and IPA engine with a 4.5 s burn time at 250 psi chamber pressure
- Performed liquid combustion and 2-phase flow modeling using MATLAB, CoolProp, and RPA to develop engine sizing spreadsheets to quantify pressure drop, mass flow rate, thrust, and fill/purge time to size fluid lines and valves
- Validated heatsink chamber thermal performance using ANSYS transient thermal analysis for 4.5 s burn duration
- Fabricated propellant tank forward and aft closures as well as engine nozzle on manual lathe

Capstone - Static Fire Test Stand

Sep. 2025 - May 2026

- Coordinated the development and fabrication of testing hardware to validate the hybrid propulsion system for the NYU Rogue Aerospace 2025-2026 competition launch vehicle
- Performed FEA using ANSYS Mechanical to ensure test stand could withstand peak thrust loading of 10 kN
- Wrote Python script allowing for live monitoring and recording of thrust and chamber pressure readings from DAQ
- Designed, ordered, manufactured, and assembled all components successfully, on time, and under budget
- Developed CONOPS to ensure safety and ease of operation during static fires

Technical Skills

Design & Analysis: SolidWorks, Fusion, ANSYS Workbench/Mechanical, CoolProp, MATLAB, Python, GD&T, DFMA

Manufacturing: CNC & Manual Machining, FDM & SLA 3D Printing, Composite Layups, Waterjet & Laser Cutting

Certifications: NAR High Power Rocketry Level 1 & 2