JAMES D. LEE

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Targeted Qualifications:

Mechanical engineering graduate student and former Rocket Lab intern with experience in vehicle integration, hardware test, CAD, machining, documentation, and interface management. Led Rowan Rocketry's IREC team through the full lifecycle of a 10,000-ft launch vehicle.

Education:

Villanova University **Villanova, PA**
Master of Science, Aerospace Engineering *May 2027*

Rowan University **Glassboro, NJ**
Bachelor of Science, Honors Mechanical Engineering (GPA 3.993) *May 2026*
Minor: Mathematics; CUGS: Combat Systems Engineering, Aerospace Engineering

Work Experience:

Rocket Lab **Albuquerque, NM**
Project Management Intern May 2025 - Aug. 2025

- Coordinated with contractors and internal team members to renovate Rocket Lab's solar cell facility, integrating new fabrication equipment without disrupting production.
- Applied lean principles and systems-thinking to optimize workflows and space utilization.
- Collaborated with R&D engineers to gain technical insight into solar cell design, thermal management, and structural requirements for integration into aerospace systems.

Tri-State Construction **Millville, NJ**
Assistant Project Manager Nov. 2021 - May 2025

- Developed and updated 3D BIM models for concrete foundations, coordinating with contractors, engineers, and architects to resolve problems and improve site efficiency.
- Played a key role in creating and organizing RFIs and submittals, ensuring timely responses, product approvals, and integration across trades to avoid scope conflicts.
- Designed and fabricated templates on a CNC router for miscellaneous sitework, simplifying complex tasks and enhancing precision.

Launch Vehicle Integration & Hardware Projects:

Rowan Rocketry – International Rocket Engineering Competition
Team Captain Aug. 2025 - Present

- Leading development of a 10,000-ft launch vehicle, overseeing subsystem teams and guiding CAD, analysis, machining, testing, and mentorship across the project lifecycle.
- Directing system design reviews, integration planning, scheduling, risk management, and technical documentation to ensure ESRA compliance and competition readiness.
- Managing team logistics, budgeting, sponsorship acquisition, technical outreach, and branding, while coordinating with university partners and industry supporters.

International Rocket Engineering Competition - Lead Payload Engineer
Rowan University *Fall 2024 - June 2025*

- Led design and integration of a 10×10×30 cm autonomous rover payload that won an award for outstanding craftsmanship on an international stage, balancing electrical, mechanical, and structural requirements under mass and volume constraints.
- Engineered deployable mechanisms and four-bar linkages for post-landing deployment, emphasizing shock resistance, mechanical reliability, and material durability.
- Developed custom PCBs in KiCad and validated motor control, sensing, and deployment systems through iterative testing and precision machining.
- Applied systems-level thinking to ensure end-to-end compatibility across embedded electronics, mechanical subsystems, and structural packaging.

3RRS Parallel Manipulator – Ball-and-Plate Control System
Rowan University *Fall 2025*

- Designed and analyzed a 3RRS parallel robotic manipulator for ball-and-plate balancing, developing inverse kinematics to model system motion and actuator geometry.
- Implemented dynamic modeling and control strategies in MATLAB/Simulink to command servo-driven linkages, optimizing responsiveness, stability, and disturbance rejection.
- Built and tested a physical prototype integrating sensors, embedded control, and precision-machined components to validate predicted behavior and tuning methods.

Supersonic Nozzle Simulation – CFD Final Project
Rowan University *Spring 2025*

- Modeled the AeroTech J350W rocket nozzle in ANSYS Fluent using a 2D axisymmetric domain to capture supersonic expansion and shock diamonds in the exhaust plume.
- Iteratively refined mesh and solver settings to resolve Mach number, pressure, and velocity contours, calculating a thrust value within 9.4% of published data.
- Validated solver accuracy using realizable k-epsilon turbulence models, structured mesh quality metrics, and chamber pressure estimation methods from Nakka's Rocketry.

Heat Shield Thermal Analysis – Heat Transfer Midterm Project
Rowan University *Spring 2025*

- Modeled transient and steady-state heat transfer on MATLAB/Simulink through a multilayer thermal protection system (TUFI-coated AETB insulation over stainless steel) representative of spacecraft recovery hardware.
- Calculated heat flux, surface temperatures, and thermal response during reentry using energy balance equations, Biot number analysis, and lumped capacitance modeling.
- Analyzed the performance of thermal protection layers to assess shielding effectiveness and inform material selection for aerospace recovery applications.

Skills: SolidWorks (CAD), FEA, ANSYS, MATLAB/Simulink, Thermal & Structural Analysis, Systems Engineering, Machining (CNC, Mill, Lathe), Additive Manufacturing, Engineering Test & Validation, Data Analysis, Technical Writing, Project Management, GD&T

Awards: DoD SMART Scholar | Lockheed Martin STEM Scholar

Certifications: Certified SolidWorks Professional (CSWP) | High-Powered Rocketry Level 1