Joshua Kraus

Bethlehem, PA | (732) 515-1549 | JoshuaJordanKraus@gmail.com | JoshuaKraus.com | LinkedIn

U.S. Citizen | Willing to Relocate | Available Full-Time Upon Graduation: May 2027

EDUCATION

Lehigh University - Bethlehem, PA

B.S. Integrated Engineering and Social Sciences, IDEAS Honors Program *May 2027*

GPA: 3.94 | Dean's List, All Semesters

Engineering Focus: Aerospace Structures, Mechanics of Materials, Finite Element Analysis, Manufacturing Engineering

AEROSPACE ENGINEERING EXPERIENCE

SpaceX - Dragon Structures Engineering Intern - *Hawthorne, CA* *May 2026-Aug 2026*

- Developed **static-equivalent dynamic loads** and owned **structural margins** on deployable parachute panels for **Dragon 2** spacecraft. Performed hand calculations to verify FEA model accuracy and refined modeling styles for computational efficiency.
- Refined Structures Integrated Finite Element models in FEMAP and Ansys supporting NASA Crew-13 **Flight Readiness Review**.
- Designed tooling for manufacturing and integration of **deployable thermal protection system (TPS)** panels, improving installation accuracy and reducing manufacturing labor hours by ~11%.
- Led two **vibration testing campaigns and analysis-to-test correlation** to characterize structural response and define flight risk.
- Owned **first-principles design and analysis** of sensor pass-through ports on the Crew-13 vehicle, collaborating with flight reliability, manufacturing, and material engineers. Led project through development and qualification testing.

Lehigh University Rocketry Association (LURA) - *Bethlehem, PA* *Feb 2025-**Present***

- As **President** *(Current)*, lead **120+ member** collegiate rocketry organization developing liquid and solid-propellant launch vehicles, payloads, avionics, and recovery systems; oversee **$40K+ budget** across three technical teams and lead a board of 15.
- Lead technical design reviews, resource allocation, recruiting, sponsorship, and **critical path planning** for sub-teams.
- **Lead thrust chamber structural/thermal analysis** for bipropellant vehicle "Bowie," using a nonlinear Ansys model to define load paths and structural requirements, drive ablative design, and plan instrumented static fire to correlate engine loads.
- As **Lead Payload Engineer** *(Feb 2025-Jun 2026)*, directed development and testing of **LAIKA**, an autonomous robotic payload for LURA's IREC launch vehicle, winning the IREC 2026 Space Dynamics Laboratory award for Technical Relevance.

NASA L'SPACE - *Proposal Writing & Evaluation Experience (NPWEE)* *Jun 2025-Aug 2025*

- **Served as chair** on a remote NASA proposal review panel, evaluating peer proposals using NASA standard programmatic review criteria.
- Co-authored a technical proposal responding to a **NASA Marshall Space Flight Center** solicitation, contributing to the engineering analysis, CAD, mission architecture, and technical/budget justification of a cryogenic piezoelectric swimmer.

Lehigh University P.C. Rosin College of Engineering - *Head Teaching Assistant, Bethlehem, PA* *Aug 2024-Jan 2026*

- Led Python, Raspberry Pi, and robotics laboratories for 80+ students; coordinated 3 junior TAs and graded student assignments.

SELECTED AEROSPACE PROJECTS

Thrust Vector Control Vehicle - "KALMAN" *Jan 2026-**Present***

- Developing a self-stabilizing rocket using a **2-axis thrust-vector control mechanism and control system**; implementing control through MATLAB, ArduPilot/Lua, and a Pixhawk. Derived equations of motion and state space model. **Developed test stand** for simulation correlation and instrumentation of the gimbal mechanism.
- Performing **nonlinear analysis in Ansys**, developing structural margins. Developed an AI tool to perform continuous **hardware-in-the-loop testing** and refinement of LQR control law from physical IMU data of instrumented TVC gimbal.

Robotic Surveyor Payload - "LAIKA" | International Rocket Engineering Competition (IREC) *Jan 2025-Jun 2026*

- Led mechanical/structural development of a ROS 2 **autonomous quadruped payload** integrated into a 12-ft launch vehicle, from requirements definition through fabrication, integration, testing, and flight.
- Performed structural analysis using Nastran to establish composite margins and reduce single-point failure modes of the deployment system; iterated hardware for deployment and recovery loads during a one-month physical testing and validation campaign.

Autonomous Thermal High Elevation and Reconnaissance Drone - "AETHER" *May 2024-May 2026*

- **Won an academic grant** to develop AETHER, an open-source autonomous UAV capable of streaming optical and thermal imagery to firefighters in the field for emergency-response and thermal reconnaissance. Demonstrated successful full-systems flight in 2026.
- Designed a **4G LTE-enabled, encrypted avionics and communications architecture**, integrated flight computers via **UART**, and developed a low-cost optical/thermal imaging payload using **OpenCV** and OpenThermal.

TECHNICAL SKILLS AND CERTIFICATIONS

Structures / Analysis: FEA | Ansys/MAPDL | FEMAP/Nastran | Abaqus | Loads Development | Structural Analysis | Vibration Testing | Modal Analysis | Thermal Analysis | Test Plan Development

CAD / Mechanical Design: Siemens NX | Fusion 360 | Geometric Dimensioning & Tolerancing | Design for Manufacturing & Assembly

Manufacturing / Integration: Manual Machining | FDM/SLA Additive Manufacturing | Composite Layup | CO2 Laser Cutting | Drawing Interpretation per ASME Y14.5-2018 | Soldering | Circuitry

Programming / Software: Python | MATLAB/Simulink | Lua | Java | ROS 2 | OpenCV | Git | Linux/Unix

Certifications: Siemens NX Design Associate | FAA Part 107 Remote Pilot | NAR Level 1 High Power Rocketry | NASA Open Science 101