

Jack Koller

jackwilliamkoller@gmail.com | (727) 642-3367 | Orlando, FL | jackkoller.com | linkedin.com/in/jack-koller/

University of Central Florida, Burnett Honors College, Orlando, FL

Master's of Science, Mechanical Engineering

Bachelor of Science, Mechanical Engineering

Expected Graduation: Spring 2027 | GPA: 3.688

Fall 2022 – Spring 2026 | GPA: 3.788

Experience

Propulsion and Energy Research Lab (PERL)

Orlando, FL

Graduate Researcher | Air Breathing Rotating Detonation Engine

August 2026 – Present

Undergraduate Researcher | Oblique Detonation Wave Engine

May 2024 – May 2026

- Developing 1-D supersonic oblique rotating detonation engine performance model in Python.
- Modeled optimized regenerative cooling channels for a vitiator nozzle in a high-enthalpy test facility.
- Designed payload fluid feed system and instrumentation housing for a hypersonic flight experiment.
- Fabricated ground test facility for qualification and acceptance testing of a sounding rocket payload.

Stratolaunch

Mojave, CA

Propulsion Engineering Intern

May 2026 – August 2026

- Designed horizontal rocket motor test stand floating frame using NX and validated using ANSYS FEA.
- Developed cryogenic coaxial injector and fluid system for altitude simulating cold box.
- Created Busemann inlet model and automated 3D inlet validation tool using OpenFOAM CFD.
- Modeled transient two-phase oxidizer tank pressurization to size regulators and PRVs from derived collapse factors.

Mitsubishi Power Americas

Orlando, FL

Manufacturing Engineering Intern

February 2024 – August 2024

- Tested and modified ABB robot grit blast code to ensure uniform bond coat layering on blades/vanes.
- Designed guided polishing fixtures for turbine blade vibratory feeder to reduce process time by 70%.
- Produced engineering drawings for coating equipment using GD&T per ASME.Y.14.5-2018.

Projects and Extracurriculars

Electric Turbopump-coupled Regeneratively Cooled Engine Design Project

May 2026 – Present

- Sized electric centrifugal fuel pump system using Euler turbomachinery equations.
- Built MATLAB tool coupling MOC nozzle contouring with regen channel optimization for AlSi10Mg.

Electric Longboard

July 2025 – Present

- Fabricating aluminum motor mount assembly using CNC mill and stationary power tools.
- Designed belt-driven motor mounts and powertrain using SolidWorks.
- Creating performance calculators for torque, speed, power draw, and battery capacity for trade studies.

Liquid Rocket Test Stand | Chief Engineer – Knights Experimental Rocketry

April 2025 – February 2026

- Led preliminary design of a 2000lbf liquid bi-propellant rocket engine test stand with 3-DOF thrust measurement system, 1500psi pressure fed liquid-liquid feed system and full instrumentation suite.
- Created transient wall heating model to predict thermal loads and inform rocket engine cooling design.
- Drafted piping and instrumentation diagrams (P&ID) for pressure fed liquid-liquid ground test feed system.

MATLAB Student Ambassador | MathWorks

February 2025 – December 2025

- Developed propellant blowdown script to analyze pressure, and volume dynamics across feed systems.
- Created workshops to model thermodynamic state properties using chemical kinetic software plugins.
- Improved MathWorks's university outreach by 170% through social media platforms and workshops.

Liquid Bi-Propellant Rocket | Combustion Lead – Knights Experimental Rocketry

August 2023 – July 2024

- Leveraged NASA CEA and Rocket Propulsion Analysis simulations to design nozzle contour.
- Designed a KNO₃ pyrotechnic nozzle-attached breakaway ignition system with ABS housing.
- Manufactured an epoxy resin composite ablative liner using compression molding.

Publications

1. **J. Koller**, Z. White, K. Ahmed (*Presenting: 2027 AIAA SciTech*)
“Analytical Performance Model for High-Speed Airbreathing Rotating Detonation Engines”
2. **J. Koller**, S. Smith, M. Rosolen, A. Kotler, K. Ahmed
“Thermomechanical Optimization of Actively Cooled Nozzles for Ground Test”
3. **J. Koller**, A. Shack, A. Kotler, S. Smith, Y. Fuentes, A. Siddiqi, R. Fodor, G. Gonzales, ... K. Ahmed
“MXOD Flight 1: Feed System and Electronics Architecture”

Skills

Software: Siemens NX, SolidWorks (CSWP), Fusion 360 (Manufacturing), ANSYS Mechanical, AutoCAD, JIRA

Programming: MATLAB, Python, OpenFOAM, Cantera, NASA CEA, ABB Robot Studio

Hardware: CNC Mill, GD&T, MIG Welding (Basic), Tube Bending, Compression Fittings, Flare Fittings, Power Tools