

Andrew Shack

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EDUCATION

Bachelor of Science in Mechanical Engineering
University of Central Florida - Burnett Honors College

Expected Graduation 2026
GPA: 3.5

PROFESSIONAL EXPERIENCE

HaloEngines | Lead Engineer 05/2024 – Present

- Designed propulsion ground test facility rated to 30k-lbf with full instrumentation suite, 3-DOF thrust measurement system, 6000psi gas-liquid feed system, and redundant high-speed DAQ system.
- Fabricated test stand frame by MIG welding steel members, manually machining structural interfaces.
- Defined test conditions for rotating detonation rocket engine, ranging from 50-1000psi mean chamber pressure.
- Guided project development by tracking milestones, budget and coordinating with government partners.

Lockheed Martin MFC CWEP | Systems Engineering Co-op 03/23 – 08/23

- Diagnosed and replaced hardware on Sniper Advanced Targeting Pods to restore system functionality.
- Performed verification testing to ensure Flight Program functionality. Identified and documented bugs within software to revise requirements and lower risk.
- Created VCRM (Verification Cross Reference Matrix) to ensure design requirements are properly tested.

RESEARCH

Propulsion & Energy Research Laboratory | Research Assistant 02/2023 – 08/2025

- Sub-System Lead on Mach 10 Oblique Detonation flight experiment, sponsored by the AFSOR.
 - o Mentored 5 students to develop flight hardware consisting of data acquisition, controls, high-pressure feed system.
 - o Tracked milestones and program slip in integrated timeline + procurement statistics including cost and lead time.
- Modeled heat transfer in ground-based high-mach vitiator, including stagnation point and flat plate heating.
- Produced novel hardware to stabilize detonation on carbon-carbon composite in high-enthalpy flow facility.
- Designed and tested data acquisition unit & accompanying LabVIEW to facilitate hot-fire test campaigns.

EXTRACURRICULARS

1974 Triumph TR6 Restoration | Personal Project 01/25 – Present

- Reconditioned car after sitting dormant for 20 years; overhauled carburetor, distributor, fuel system, and body.
- Refurbished brake system by cutting and bending new copper brake lines, and rebuilding calipers and drums.
- Retrofit independent circular connectors for main power and signal connections through firewall bulkhead.

NASA Proposal Writing and Evaluation Experience (NPWEE) 01/23 - 4/23

- Reviewed NASA Taxonomy to develop a Quad Chart & full proposal with a team of ~13.
- Created CAD assembly of proposed Geothermal Resonator incorporating proprietary PCM (Phase Change Material), and TEG (Thermoelectric Generator) within a custom insulating composite body.

NASA Student Launch Initiative | Payloads Telemetry Lead 8/22 - 03/23

Knights Experimental Rocketry @ UCF - Orlando, FL

- Lead team of 10 members through weekly meetings & manufacturing sessions.
- Designed & fabricated avionics bay and ground station to relay flight data and imagery from mock lunar lander.
- Wrote, reviewed, and presented Critical Design Review to NASA Advisory Board.

PUBLICATIONS

- **A. Shack**, S. Smith, A. La Sorsa, A. Kotler, K. Ahmed, “Heat Flux Characterization of High-Speed Flow Facility”, AIAA SciTech Conference, 2026 (accepted)
- J. Koller, **A. Shack**, A. Kotler, S. Smith, Y. Fuentes, G. Gonzales, P. DeHart, K. Ahmed, “MXOD Flight 1: Feed System, Electronics, and Instrumentation Architecture”, AIAA SciTech Conference, 2026 (accepted)
- S. Smith, A. Kotler, J. Sprunger, S. Keene, **A. Shack**, J. Koller, K. Ahmed, “MXOD Flight 1: Program & Experiment Overview”, AIAA SciTech Conference, 2026 (accepted)
- E. Pereria, J. Reyes, A. Kotler, **A. Shack**, “First Order Performance Modeling for Predicting GH₂/GOx GH₂/Air RDRE Performance at Low Average Chamber”, AIAA SciTech Conference, 2026 (accepted)

SKILLS

Software: MATLAB, Python, LaTeX, SolidWorks, LabVIEW, REFPROP, Cantera, KiCAD

Fabrication: MIG Welding, Manual Mill & Lathe, FDM & SLA 3D Printing,