



USC

Liquid Propulsion Laboratory

Sponsorship Package
2026



Industry Standard,
Collegiate Scale.
100% Student-Run



WHO WE ARE

Our Founding Mission

In 2015, four rocket enthusiasts at USC saw the rise of liquid propulsion as the future of aerospace. In pursuit of this path, they founded the Liquid Propulsion Lab (LPL).

Their focus? Rapid design, test, and documentation of liquid propulsion engines. Their mindset? Strive for the **industry standard** at a **collegiate scale**.

Today, LPL is a leading student group in liquid rocketry innovation. With 22 papers published, 10 engines built, and 75+ members, we are shaping the next generation of aerospace leaders.

And this year, we launched our most ambitious project to date:

Building Ranger 1,
America's first student
reusable rocket lander.





INDUSTRY STANDARD, COLLEGIATE SCALE.

Since its beginning, LPL has had one core pillar — meet and exceed industry standards as students.

We design for practicality, chase test cadence, and iterate on results. And we do it fast.

With 10 engine hotfires in 2025, this mantra is core to every undertaking, and it's our driving mindset in building our new lander.



300+ ALUMNI

"LPL is the place to learn how to fail. It's a platform where you can make mistakes with low consequences. Learning how to make mistakes in lab, so you won't when you have to land humans on the moon."

- LPL Alumni

SPACEX

Relativity VAST



BLUE ORIGIN



FIREFLY
AEROSPACE

AERJET
ROCKETDYNE
An L3Harris Technologies Company

NORTHROP
GRUMMAN

amazon



BOEING

HERMEUS

THE
BORING
COMPANY

LOCKHEED MARTIN

VARDA ASTRANIS

AEROSPACE GOE
SECOND ORDER EFFECTS

RADIANT TESLA

Inversion TURION
SPACE

Lumindt SKYRYSE

"When I first joined the team and saw that several of our REs were women, the ceiling didn't feel so close anymore. Aerospace has long socialized us to believe that success in this field doesn't look like us, but having role models who share your gender identity reshapes what feels possible. Representation isn't just symbolic; it redefines the limits you imagine for yourself."

- LPL Member



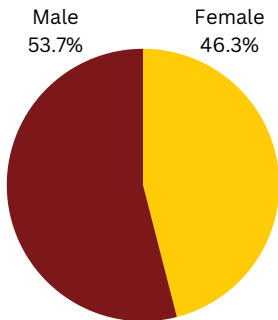
IMPACT & INCLUSION

Liquid Ladies is an LPL initiative to uplift gender minorities pursuing careers in aerospace. This call to action came in response to the stark gender divide across the industry, and seeks to transform the story of the "statistics" into a story of equal opportunity—and, experience.

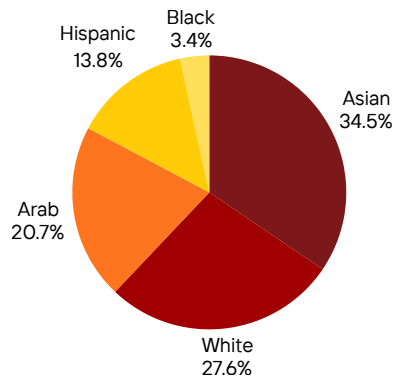
Through workshops, social events, and spotlights, Liquid Ladies has taken meaningful steps toward leveling the playing field while fostering visibility, connection, and support.

Our goal is not only to empower women, but to create a culture where everyone, regardless of their background, can benefit from a more inclusive, equitable, and positive experience in aerospace.

Gender

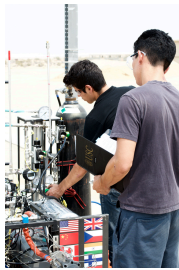
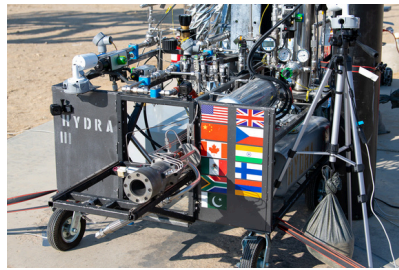


Ethnicity



*As of Fall 2025

HOTFIRE HISTORY



2015
Founding

2016
KNOX

- Built NOx-Kerosene engine
- LPL's first hotfire

2017
BLUE STEEL

- First re-fire (5x) of an engine
- Fired 5x from 2016-2017
- GOx-Kerosene

2018
JESSIE & JAMES DEV 1

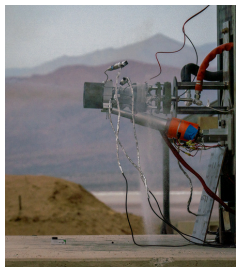
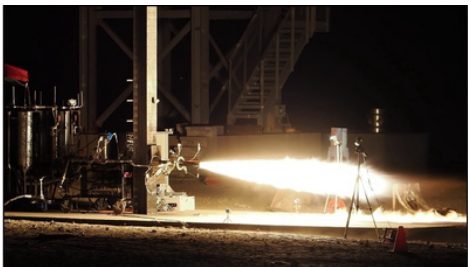
- Dual erosive engines designed for dual-engine testing development

2019
BALERION DEV 1

- Most powerful student engine at the time (2250 lbf)
- LPL's first cryogenic engine
- First & only explosive failure

2020





2021

2022

2023

2024

2025

2026

J&J DEV 1

- Final fire before injector redesign

MIKE'S FURY x2

- Hodor and Atlas - first cryogenic test stands
- TVC Dev 1

BALERION DEV 2

- Flange redesign
- Highest thrust hotfire

J&J DEV 2 x3

- Injector redesign for LOx
- Throttle Dev 1

NOMAD x7

- TVC Dev 2
- Throttle Dev 2 & 3

THESEUS x2

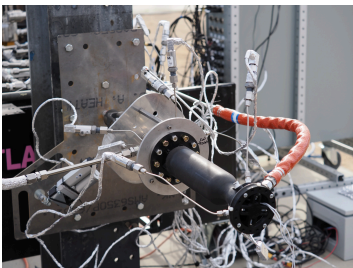
- In-house composite ablative engine

J&J DEV 2 x3

- Throttle Dev 2

RANGER 1

- First flight...



THE LANDER

CPLC Challenge

- Ranger 1 is competing in the Collegiate Propulsive Lander Challenge (CPLC)
- Competing against global teams for 3 flight milestone awards

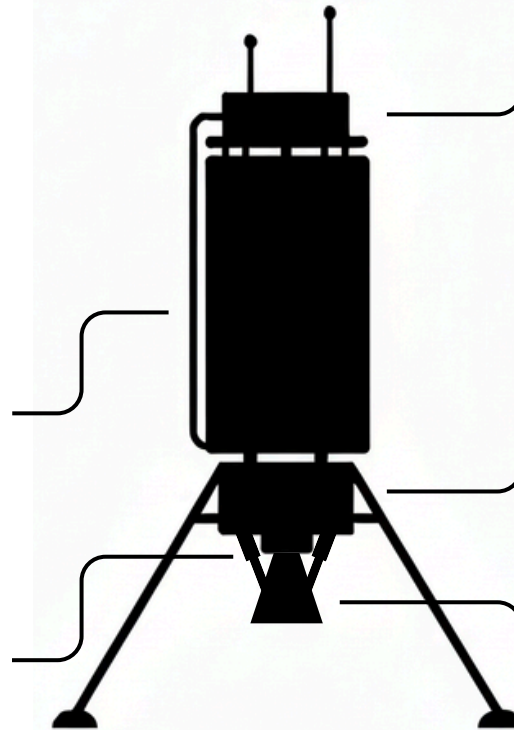
Structural & Fluids System

- Bipropellant, pressure-fed blowdown system
- Cryogenic-compatible
- Stacked tanks, welded structure

Thrust Vectoring Actuators

- 12-degree circular control range
- In-house electronic actuators, built for <\$400
- Validated in 3x engine hotfires

RANGER 1



Avionics

- In-house designed PCBs
- High-speed processing capabilities for closed-loop controls
- Feed system and attitude determination sensing
- Low-latency control of valves and actuators

Throttle Valves

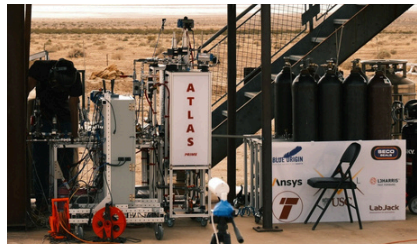
- Closed-loop engine thrust control using ball valve + geared motor
- 5:1 thrust modulation demonstrated in hotfire testing
- Mixture ratio control for smooth transient phases
- In-house design, built for <\$400

Nomad Engine

- Thrust: 675 lbf
- Propellant: Kerosene-LOX
- Cooling: Regenerative
- Injector: Like-doublet impinging

Atlas Prime Test Stand

- Primary feed system for engine testing
- Jet-A & Liquid Oxygen
- Total flow rate: 12 kg/s
- Maximum pressure: 1500 psi
- Tank volume: 5.8 gal per side
- Modular structure for pressurant and additional tanks



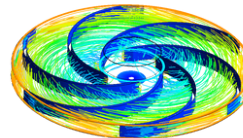
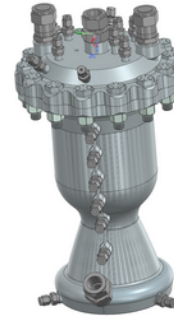
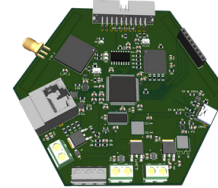
Water Flow Test Stand (WFTS)

- High-fidelity flow test stand to characterize engines & components
- COPV tanks and blast protection
- EHS-approved for indoor use
- Total flow rate: 5 kg/s
- Maximum pressure: 900 psi
- Custom DAQ and software



Prometheus Igniter Stand

- Augmented spark igniter test stand
- Gaseous methane and oxygen
- Maximum pressure: 1200 psi
- Custom igniter designs to integrate with Nomad and Nova engines
- 27x test fires in a single day



GROUND SYSTEMS

DAC

- Custom-built data acquisition and control unit
- 2 Labjack T7 controllers
- Data acquisition of 40+ sensors and control of 20+ valves
- Custom software architecture with a frontend GUI for control room operators

Nova Engine

- Regeneratively-cooled engine
- Coaxial swirl injector
- 2250 lbf thrust
- Kerosene-Liquid Oxygen
- 3D printed Inconel-718

Aorta Turbopump

- Single shaft turbopump design
- 15 GPM flow rate, 800 ft head rise

HOW YOU CAN HELP

As a 501(c)(3), USC LPL cannot build Ranger 1 without your help. While a fraction of our finances come from the school, our primary budget must originate externally.

There are several key ways to help:

- **Hardware donations**—such as fluids components, raw stock, and machining services—is invaluable to us and our building capabilities.
- **Monetary donations** fund critical materials, tooling, and components for building and testing our lander.
- **Mentorship** through design feedback and industry insight is essential in maintaining the standards that we strive for.

One small donation from you is one giant leap for America's first student lander.

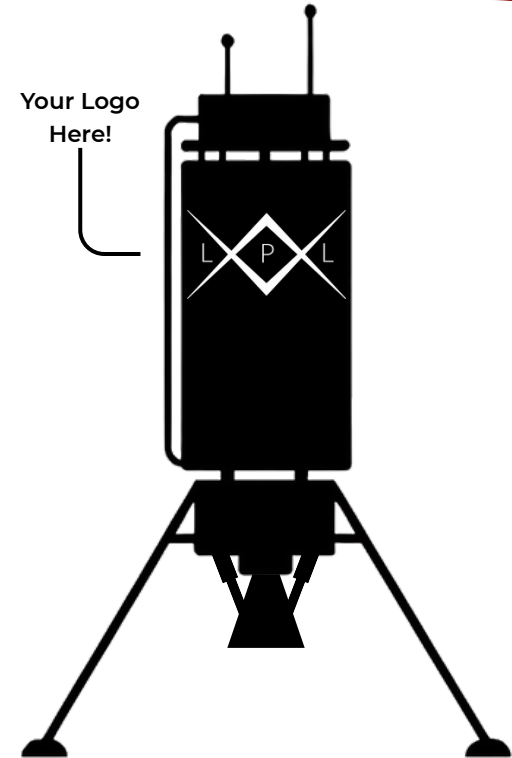
Our Sponsors



SPONSOR BENEFITS

	Bronze <\$1,000	Silver \$1,000+	Gold \$5,000+	Platinum \$10,000+
Name on LPL website	•	•	•	•
Logo in lab space	•	•	•	•
Social media post		•	•	•
Access to resume book		•	•	•
Logo on Atlas & Ranger 1		•	•	•
Repeated social media tags			•	•
Logo on Ranger 1 merchandise			•	•
LPL networking event			•	•
Preferred logo placement				•
Exclusive design presentation				•
Metal Ranger 1 plaque				•

- Hardware or service donations are equivalent to the monetary value donated.
- Software license sponsorship tiers are dependent on license value.





Sponsors like you allow
students like us to
make history.



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lplusc.com

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FIGHT ON!