



# RICE ECLIPSE

Sponsorship Opportunities  
2023 - 2024



[eclipse.rice.edu](http://eclipse.rice.edu)



# We are Rice Eclipse.

Rice Eclipse is Rice University's student rocketry team. Our mission is to enrich the education of our members with project-based learning to develop cutting edge aerospace technologies. We develop launch vehicles, rocket engines, avionics hardware, and avionics software to compete in the annual Spaceport America Cup intercollegiate rocketry competition.

We are brought together by a passion for learning and innovation, and every member is dedicated to helping their teammates reach their full potential as future engineers, scientists, and people, regardless of skill level or academic year.



# President's Letter

Dear Friends of Rice Eclipse,

I hope this finds you well. I am Ian Rundle, President of Rice Eclipse for the 2023-2024 academic year. Eclipse is Rice University's student rocketry team, consisting of over 90 active undergraduate students from various backgrounds and majors. As the largest engineering design team at Rice, we continue to push forward with new and interesting projects. Our mission is to provide Rice students with aerospace engineering experiences which develop their technical and professional skills beyond the classroom.



**Ian Rundle**  
*Rice Eclipse President*  
ian.R.Rundle@rice.edu

Last year, we made team history by flying our first dual-stage rocket, Icarus & Daedalus, which featured two solid rocket motors. Out of over 120 teams competing at the Spaceport America Cup, our team had one of the six dual stage rockets and one of the four autonomous drone payloads. We successfully recovered the bottom stage of our rocket, but unfortunately our top stage had a main parachute deployment failure. Nevertheless, we learned a lot from this rocket, and have added a new materials testing team to ensure the robustness of our custom-made body tubes, which were most likely the point of failure on our sustainer stage.

This coming year is another pivotal year for the club, and we are already preparing for the journey ahead. We are finalizing the test campaign of our custom hybrid rocket engine Titan II, which entails three more hot fire tests. We will also design and build Archimedes, the rocket that features Titan II, and fly it at the 2024 Spaceport America cup. In parallel, we will also test advancements of our new R&D hybrid engine, Proxima. Flying a hybrid engine has been a primary team goal since the our founding almost 10 years ago, and we are putting all hands on deck to finally achieve it this year.

Additionally, we aim to continue making impressive progress on our other projects. After the first test flight of our autonomous paraglider system last year, we plan to scale up our design and attempt to land a rocket with it. Our new embedded telemetry team will develop custom flight computers for triggering rocket separation. Our avionics R&D team will build a computer vision-based rocket tracking system, and our aerodynamics R&D team will continue research and testing for our long-term goal of a spaceshot rocket.

While we have a lot of work ahead of us this year, we will continue to provide every one of our members with a uniquely fun engineering and teamwork experience, and will proudly carry on our policy of welcoming absolutely anyone who is interested in our team.

Best Wishes,

Ian Rundle

# Student Leadership

## Officer Board



**Ian Rundle**  
*President*



**Mark Lopatofsky**  
*Co-Chief Engineer*



**Warren Rose**  
*Co-Chief Engineer*



**Esther Fahel**  
*Public Affairs Officer*



**Zach Wilson**  
*Chief Financial Officer*



**Amy Danjul**  
*Chief Safety Officer*



**Adam Sher**  
*Avionics Lead*



**Liam Manley**  
*Propulsion Lead*



**Dan Zislis**  
*Aerodynamics Lead*

## Team Leads

### Aerodynamics

<b>Lovin George</b>	<i>Airframe</i>
<b>Ethan Zhang</b>	<i>Aerodynamics R&amp;D</i>
<b>Mitchell Hoffman</b>	<i>Flight Control</i>
<b>Charlene de la Paz</b>	<i>Structures</i>
<b>Sara Elliott</b>	<i>Composites</i>
<b>Daniel Ramirez</b>	<i>Composites</i>
<b>Ilina Goyal</b>	<i>Recovery</i>
<b>Sam Server</b>	<i>Payload</i>
<b>Justin Lebeau</b>	<i>Materials Testing</i>
<b>Max Rudin</b>	<i>Certificates</i>

### Propulsion

<b>Frahanco Deressa</b>	<i>Proxima Engine</i>
<b>Lavinia Barker</b>	<i>Titan Engine</i>
<b>Riley Kuhlman</b>	<i>Engine Support</i>
<b>Jack Maury</b>	<i>Launch Rail</i>
<b>Fred Gachoka</b>	<i>Fluid Flow</i>
<b>Isabella Baker</b>	<i>Chemicals</i>
<b>Sean Bishop</b>	<i>Chemicals</i>

### Avionics & Software

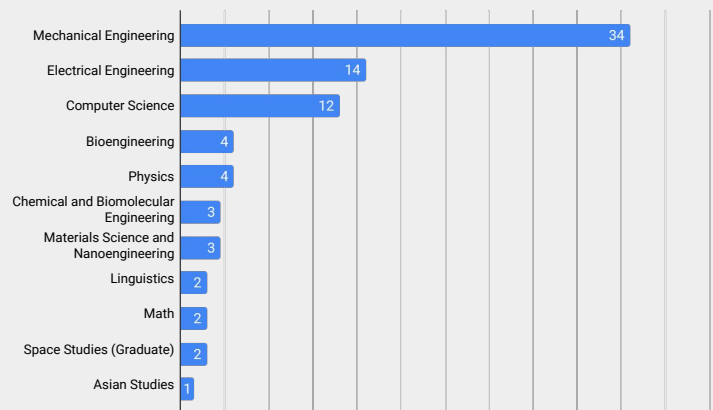
<b>Ryan Kuykendall</b>	<i>Mission Control</i>
<b>Max Kuhlman</b>	<i>Embedded Telemetry</i>
<b>Henry Prendergast</b>	<i>RF Communications</i>
<b>Beck Edwards</b>	<i>Auto-Recovery</i>
<b>Elaine Ren</b>	<i>Avionics R&amp;D</i>



# Meet the Team

**90+** Active Members  
Spring 2023

## Majors



Camille Williams

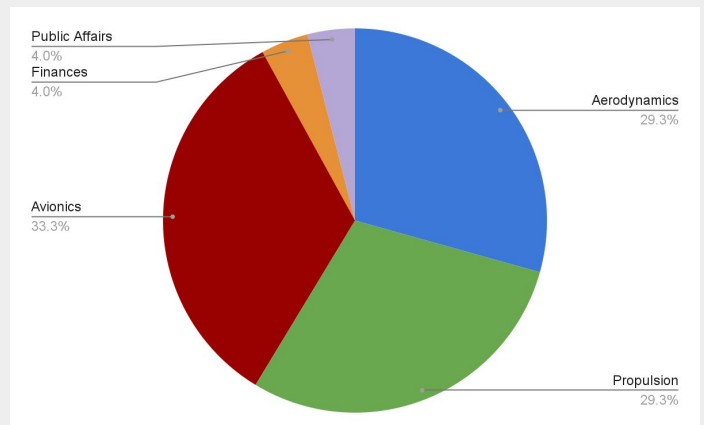
*“When I joined Eclipse, I was intimidated since I had no rocketry experience, but I quickly became at ease. In one year, I learned to design, fabricate, and test rockets, all while working with smart and kind people. Through Eclipse, I furthered my passion for aerospace and my desire to pursue a career in the field.”*



Frahanco Deressa

*“Eclipse has been a great experience for me to apply concepts from class, develop critical aerospace skills, and gain exposure to industry practices. It is great being on a team where I can be impactful and learn what it means to be an engineer with my peers.”*

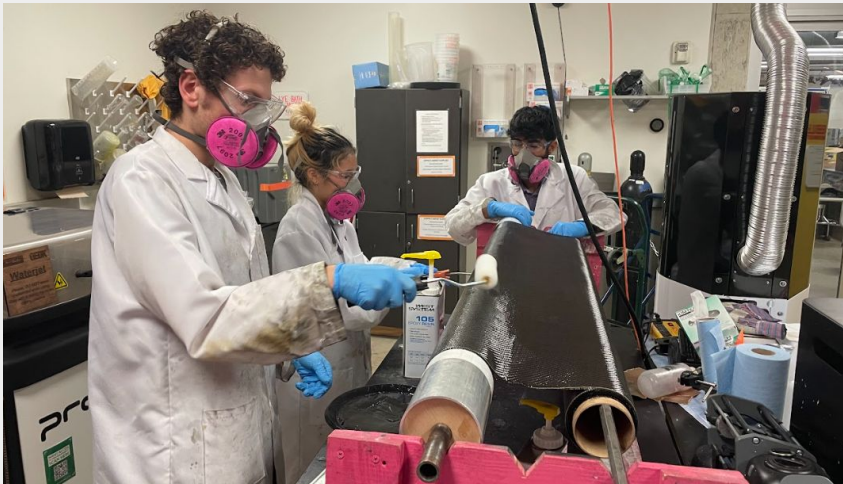
## Project Participation



# Aerodynamics

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Rice Eclipse competes annually in the world's largest intercollegiate rocketry competition, the Spaceport America Cup. For three years, Eclipse competed to reach a 10,000 ft altitude using a commercially available motor. Three years ago, we began building supersonic rockets, launching them to a target altitude of 30,000 ft, exploring new innovations each year. Last year, this new technology was a dual-stage rocket, Icarus & Daedalus. And this year, we will launch our first hybrid engine rocket, Archimedes, using knowledge from our successes and failures over the years.



## Certificate Launches

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Rice Eclipse provides students with an opportunity to learn about high powered rockets at no cost to our members.

Through the Tripoli Rocketry Association, students can obtain official certifications in high powered rocketry after designing, building, and flying their very own rockets. All material and motor costs are paid for thanks to the support of our sponsors, allowing anyone to get involved with rocketry. Certificate launches are an enjoyable all day experience with members able to experience multiple rocket launches throughout the day.

# Propulsion

## Titan II Hybrid Rocket Engine

The Titan II engine is Rice Eclipse's flight-optimized hybrid rocket engine, and will be the most powerful rocket engine the team has designed to date. This engine will be used as the propulsion system for the team's 2024 Spaceport America Cup 30,000 ft SRAD rocket, Archimedes. We are going to continue our hot-fire testing campaign this year in order to gather as much data as possible on the ground and make necessary modifications before launching in the Archimedes airframe. This flight will complete Eclipse's long term goal of launching a student-designed and manufactured rocket engine, and we are almost there!



## Mobile Launch Platform

In order to launch Archimedes, a large scale launch rail is required. Eclipse has designed, and is now in the process of manufacturing a 40 foot launch rail with a self contained raising system. This is all designed to integrate with the current mobile test stand, allowing us to launch anywhere. Last year a 15 foot version of this system was tested, and now we are upgrading to the larger version.



## Proxima Test Engine

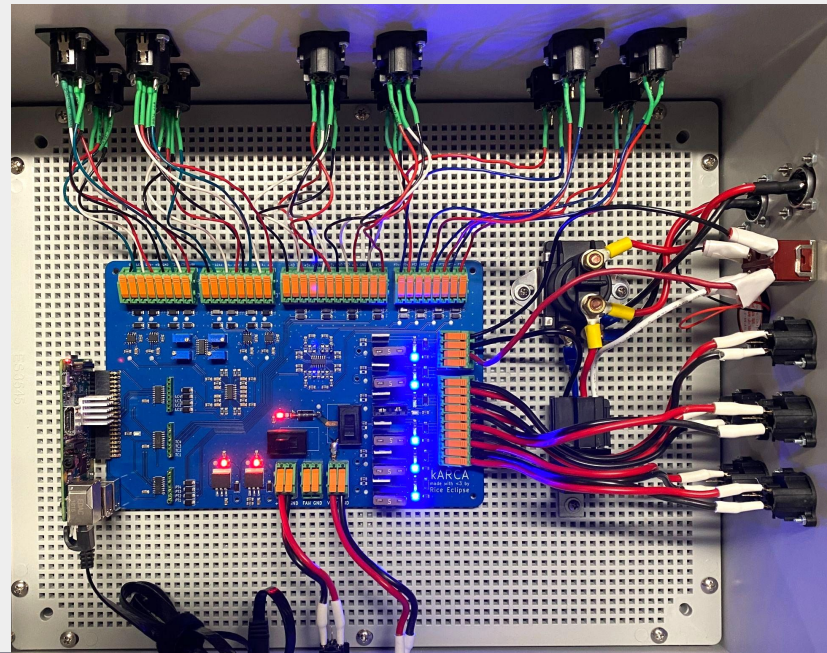
Proxima is Rice Eclipse's new hybrid rocket engine that can produce up to 92 pounds of thrust. It is planned to be the team's propulsion testbed, allowing small-scale, quick-turnaround tests of components like fuel grains, injectors, and nozzles, to improve our larger engines, such as Titan II. Proxima is currently finishing up manufacturing, and we are super excited to start experimental testing!



# Avionics & Software

## Engine Control System

kARCA is Eclipse's custom control system for testing our hybrid rocket engines. It commands firing sequence functions such as valve actuation and ignition. It also records data from the engine load cells, thermocouples, pressure transducers, and strain gauges, and transmits that data to our mission control station, situated a safe distance away. kARCA will see extensive use this year as it helps us test both our Titan II and Proxima hybrid engines!



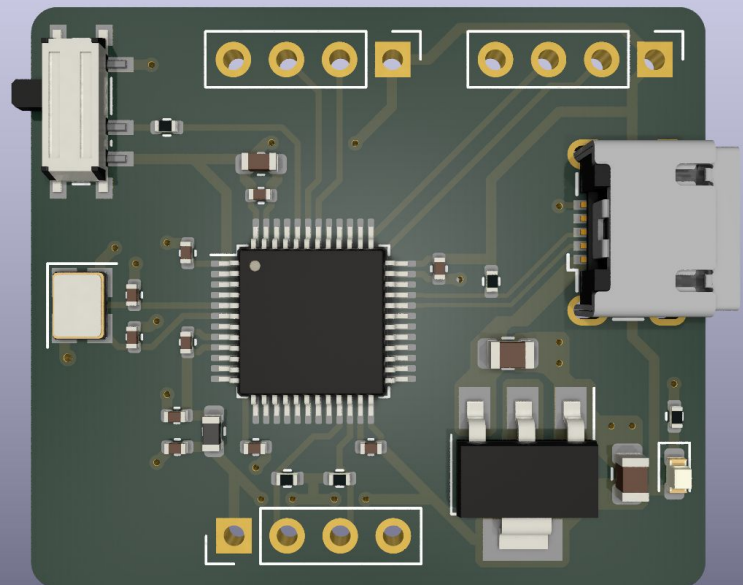
## Autonomous Paraglider

In the Argonia Cup competition, teams aim to launch a payload and recover it as close as possible to a designated target location. To meet this challenge, Eclipse designed KOREKAU, a rocket-deployed paraglider which autonomously flies to a preprogrammed location. This year we will build a scaled-up auto-recovery system in the next step towards our long-term goal of autonomously recovering our rockets!



## Embedded Flight Computer

This year, Eclipse is creating our first fully-featured custom flight computer. Using an array of sensors, it will collect data on the rocket's position, altitude, orientation, and acceleration. It will use that flight data to intelligently activate its pyrotechnic channels, triggering rocket separation events. This will be Eclipse's first system based around STM32 microcontrollers, and we can't wait to see what exciting avionics projects this new platform will help us create!







## Outreach

We at Rice Eclipse are proud of the work we do outside of our projects to engage with the Houston community. Rice Eclipse participates in a variety of outreach activities devoted to STEM education and spaceflight awareness. Eclipse is a regular participant in the local Cub Scouts Rocketry Day, where we help Cub Scouts prepare their rockets for launch. Eclipse has also given presentations at multiple Cub Scouts meetings on the basics of rocketry. Eclipse additionally participates in Rice University's Reach for the Stars, an event to inspire young girls to pursue aerospace careers.

Along with these, Rice Eclipse does outreach work in the Houston aerospace and engineering communities. The team has presented at the Houston Maker Faire, NASA Safety Day at Johnson Space Center, and multiple gatherings of industry representatives and Rice alumni. We believe that these activities are critical to inspire the next generation of Houstonians to look towards the stars and empower them to pursue their interests.

# How to Help

The continued success of Rice Eclipse depends on the generosity of private donors and corporate sponsors. Join our team of partners, so we can keep providing Rice University students with the technical and leadership skills they need to succeed as engineers. We accept both monetary and material/ part donations.

Monetary donations are essential for parts and supplies used in rocket and engine manufacturing.

Material donations from graphite nozzles to engine machining are implemented directly into rocketry projects.

Rice Eclipse is a 501(c)(3) non-profit, tax-exempt organization, so all donations to the team are tax-deductible.

Support us at <https://riceconnect.rice.edu/donation/support-rice-eclipse> or through our website at <http://eclipse.rice.edu/support-us>.



# Sponsorship Levels

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## Interstellar - \$5,000+

- Rockets, rocket components, and Rice Eclipse members will be available for presentations at corporate events
- Logo prominently displayed on 2024 Spaceport America Cup rocket
- Company's promotional material handed out at team events

## Interplanetary - \$2,500+

- Sponsor an engine test, rocket launch, or other team event
- Speaker invitation to general meeting
- Dedicated company banner displayed underneath Rice Eclipse banner in team workspace and at team events
- Medium-sized logo displayed on 2024 Spaceport America Cup rocket
- Name and logo on the hybrid engine mobile test stand

## Orbital - \$1,000+

- Name and logo displayed underneath the Rice Eclipse banner in team workspace and at team events
- Team shirts made available to sponsors
- Small logo displayed on 2024 Spaceport America Cup rocket

## Suborbital - \$500+

- Name and logo on T-shirt, website, project posters, and promotional materials
- Shoutouts on team social media
- Regular project updates

*All sponsorship levels include benefits of the below levels.*

*Non-monetary donations will be given an equivalent sponsorship level based on the value of goods and services provided.*

# Past Sponsors

## Interstellar



Oshman Engineering Design Kitchen

## Interplanetary



RICE UNIVERSITY  
Rice Center for Engineering  
Leadership (RCEL)



**DMC**

Smart People. Expert Solutions.®

## Orbital



**STUDENT ACTIVITIES**  
PRESIDENT'S PROGRAMMING FUND  
RICE UNIVERSITY STUDENT CENTER



**FIRST MODE**



RICE UNIVERSITY  
Electrical and  
Computer Engineering



**LabJack**

Measurement & Automation



**TRI-GEMINI** LLC  
Custom Machining - Graphite - EDM Sinker Supplies



RICE UNIVERSITY  
Materials Science and NanoEngineering



RICE UNIVERSITY  
Rice Space Institute

## Suborbital



RICE UNIVERSITY  
Department of  
Computer Science

**Jacobs**

RICE ECLIPSE

