

Newsletter

IOWA STATE UNIVERSITY



Welcome to Cyclone Rocketry!

Greetings, Rocketry Enthusiasts! Welcome to the inaugural edition of Cyclone Rocketry Newsletter. At Cyclone Rocketry, we aim to leverage our extensive expertise in the engineering design process to inspire and engage students in STEM education, fostering a shared culture of academic growth and innovation within our community. This space will keep you updated on team progress, upcoming events and competitions. Let's soar to new heights together!

Rocketing Ahead: This Year's Projects

Selene:

Selene is Rocketry's entry into the Intercollegiate Rocket Engineering Competition (IREC) 2025. It is designed with a Student Researched and Developed hybrid motor to fly the rocket to 10,000ft, a piston ejection system, and a reefed parachute. It also uses an updated apogee prediction algorithm to control an airbrake, improving our apogee accuracy.



High Power Rocketry:

High Power Rocketry (HPR) is a dynamic division within Cyclone Rocketry where students design, build, and launch their own rockets. Through HPR, students can earn certifications to fly rockets with increasingly powerful motors, divided into three levels based on the motor's impulse. A Level 1 certification allows students to fly rockets using H-I class motors, Level 2 certifies them for J-L class motors, and Level 3 qualifies them to work with M-O class motors.

HPR provides an excellent opportunity for students to broaden their skill set and deepen their knowledge of rocketry, going beyond the scope of sub-teams. It's a hands-on experience that exposes students to every aspect of rocket development, from working with composite materials to mastering avionics.

Behind the Rockets: Meet the Teams



Aerostructures Team:

The Aerostructures Subteam oversees the design, analysis, and manufacturing of rocket airframes.

Current Activities:

- Manufacturing Helios' carbon fiber airframe (30k rocket) and implementing a durable aluminum mold for couplers.
- Researching pre-preg fibers with a new oven to enhance future builds.

Upcoming Projects:

- Completing Selene's airframe next semester and conducting fin and nosecone performance analysis.



Avionics Team:

The Avionics Team designs and develops electronic systems for rocket guidance, data collection, and airbrake control.

Current Activities:

- Implementing a dual-PCB design for improved system functionality.
- Enhancing IMU capabilities through raw components and surface-mount soldering.

Upcoming Projects:

- Finalizing the redesigned altimeter system.
- Integrating the system into upcoming rockets.





Mechanical Team:

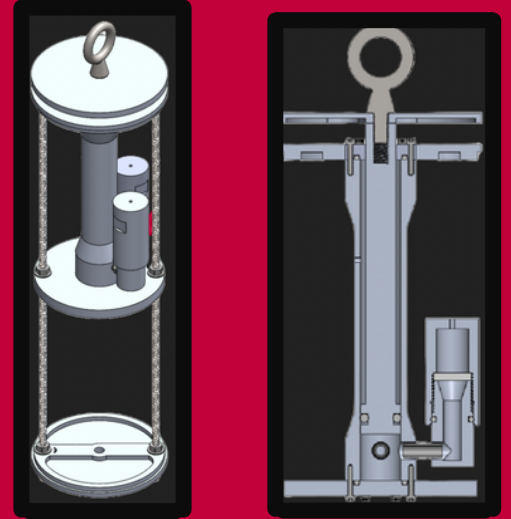
The Mechanical Subteam develops critical rocket systems, including airbrakes and piston ejection systems.

Current Activities:

- Designing and testing airbrakes and burst disc systems while collaborating with Boyd Lab for manufacturing.

Upcoming Projects:

- Finalizing designs and initiating full-scale production.



Current (2024-2025) Piston Ejection System Design

Propulsion Team:

The Propulsion Subteam is pioneering the development of Cyclone Rocketry's first hybrid rocket motor to compete in the 10k SRAD Hybrid Division of IREC.

Current Activities:

- Designing an N-class hybrid motor using nitrous oxide and HTPB.
- Developing ground support equipment like test stands, quick disconnect umbilicals, and servo assemblies.

Upcoming Projects:

- Qualifying and test-firing the motor in early 2025.
- Preparing hardware and operations for IREC 2025.





Recovery Team:

The Recovery Team ensures the safe and reliable return of rockets, meeting Intercollegiate Rocket Engineering Competition (IREC) standards.

Current Activities:

- Designing Helios' parachute (30k COTS test vehicle) and improving geometries for better drag and stability.
- Collaborating with the Mechanical and Avionics teams on a reefed recovery system.

Upcoming Projects:

- Testing Helios' parachute in the spring and developing a new design for Selene (10k hybrid rocket).



Payload Team:

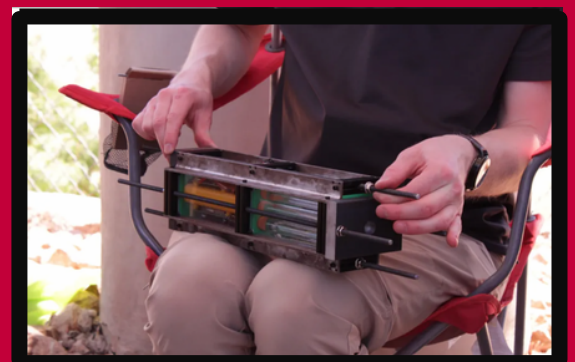
The Payload Team designs and builds payloads for the IREC rocket, conducting scientific experiments or technical demonstrations.

Current Activities:

- Developing a vacuum chamber to simulate high-altitude conditions and test component survivability.
- Designing telemetry software for data transmission and ground communication.

Upcoming Projects:

- Refining telemetry systems for future missions.



Spaceshot Team:



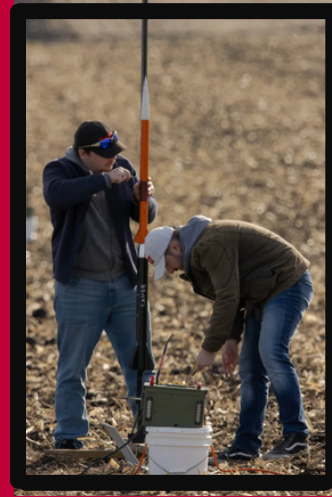
The Spaceshot Team aims to design and build high-altitude rockets capable of reaching space.

Current Activities:

- Manufacturing components like the fin can and aluminum transition.
- Researching a canard-based active control system.

Upcoming Projects:

- Completing and testing the two-stage rocket Cause & Effect.
- Preparing for the late March competition.



A Heartfelt Thank You

On behalf of Cyclone Rocketry, we extend our deepest thanks for your generous support. Your contribution has been instrumental in enabling our teams to pursue groundbreaking projects, overcome engineering challenges, and inspire a passion for rocketry within our community. Thanks to donors like you, we've gained invaluable hands-on experience, reached exciting milestones, and brought our rocketry dreams to life. Your belief in our vision drives us forward, and we are truly grateful for your commitment to our growth.

GO CYCLONES!