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Club Overview

Who are we?
- ~60 students across all disciplines who are passionate about space sciences and space tech
- One of the largest engineering and science student orgs on campus

What do we do?

Our project teams this year include...
- Spaceport America Cup
- High Power Rocketry L1/L2 Certification Program
- High-Altitude Ballooning
- NASA RASC-AL Challenge
- Active Controls

In the past, we’ve worked on...
- SpaceShot (sounding rocket capable of going to space)
- Project Nebula (7th place rocket at SA Cup 2019)
- NASA’s Micro-g NeXT finalists
- NASA’s BIG Idea Challenge

How do we reach out to Princeton and our local community?
- Arduino workshops with local schools
- Hosting speaker events with aerospace professionals from academia and industry
- Community rocket build + launch events
- Society of Women Engineers annual High School Engineering Day for local students

Have more questions? Contact us at rockets@princeton.edu.
Sponsorship Information

Princeton Rocketry Club is seeking sponsors for the 2021-2022 academic year. In return for monetary and in-kind donations, PRC provides several sponsorship packages to help thank our sponsors.

If you would like to provide in-kind donations such as hardware or materials for our projects, we can attribute the value of those donations to the appropriate sponsorship level. Additionally, if you'd like to sponsor a specific project, please let us know.

As a student organization within Princeton University, PRC is a 501(c)3 Nonprofit. All donations are tax deductible. University W-9 forms can be provided if requested.

<table>
<thead>
<tr>
<th>Level</th>
<th>Amount (USD)</th>
<th>Benefits*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bronze</td>
<td>up to $1,000</td>
<td>Logo on website.</td>
</tr>
<tr>
<td>Silver</td>
<td>$1,000</td>
<td>Access to resume booklet. Sponsored shout-out posts on club social media.</td>
</tr>
<tr>
<td>Gold</td>
<td>$2,500</td>
<td>Use of all club media (videos, photos) for marketing.</td>
</tr>
<tr>
<td>Platinum</td>
<td>$5,000</td>
<td>Logo on all competition and high-profile launch vehicles. Access to and recognition at all speaker events.</td>
</tr>
<tr>
<td>Title Sponsor</td>
<td>$10,000</td>
<td>Large logo on all vehicles. Explicitly mentioned as a sponsor in all press releases and University publications.</td>
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</tbody>
</table>

* All benefits are cumulative.

Design reviews (valued at $500) and the cost of donated materials are considered in the valuation

Want to sponsor us? Contact us at rockets@princeton.edu.
Past Projects: SpaceShot
INTERNAL CLUB PROJECT

We designed, built, and launched the smallest sounding rocket ever designed with the capability to reach an altitude of 150 km. We obtained federal approval for the space launch from the Federal Aviation Administration (FAA) Office of Commercial Space Transportation.

SKILLS
CAD, 3D printing, finite element analysis (FEA), advanced manufacturing techniques

TOOLS
State-of-the-art composites lab, 3D printers, CNC mill

RESULTS
May 2018: Our first rocket successfully launched from Spaceport America, reaching an altitude of 47,610 feet. The rocket had a second-stage ignition failure.
May 2019: Our second rocket was launched from Spaceport America, and preliminary data showed that the rocket reached the Karman line.
Past Projects: CanSat
ORGANIZED BY AAS AND AIAA

We participated in a competition to build rocket payloads for aerospace applications.

In 2017, we built a solar-powered Venus glider for atmospheric sampling to be launched on a high-power rocket for an Earth-based test.

In 2018, we built a probe that deployed an aero-braking heat shield that descended at a target velocity.

SKILLS
CAD, 3D printing, PCB design and manufacturing, RF communications design, fluid mechanics analysis, microcontroller programming

TOOLS
Creo, KiCAD, EAGLE, Fritzing, Arduino, Stratasys and MakerBot 3D printers, Epilog laser cutter, electronics shop tools, machine shop tools, wind tunnel

RESULTS
2017: Placed 25th out of 87 teams in the international competition.
Past Projects:
Spaceport America Cup
ORGANIZED BY SPACEPORT AMERICA

We successfully designed and built PRC’s first competition rocket, launched at Spaceport America Cup in 2019. The 10ft, 50lb rocket reached an altitude of over 10,000 ft and was judged on design, execution, project report, and flight success.

SKILLS
CAD, 3D printing, PCB design and manufacturing, RF communications design, flight trajectory simulations, microcontroller programming, control systems design

TOOLS
Creo, QGroundControl, MAVLink, PX4 flight stack, electronics shop tools, machine shop tools

RESULTS
Placed 7th out of 46 teams in the 10k COTS division. Placed 14th out of 1044 teams overall.
Past Projects: Micro-g NExT
ORGANIZED BY NASA

The Princeton Micro-g NExT team competed in the Mini-Arm End-Effector challenge, which is related to potential missions to ocean worlds such as Europa where a robotic arm would handle ice underwater. We designed a soft robotic gripper that uses a neoprene bag filled with small granules that can go between malleable and rigid states to grip objects.

SKILLS
CAD, 3D printing, PCB design and manufacturing, microcontroller programming, mechanical design, control systems design

TOOLS
PTC Creo, laser cutter, electronic shop tools, waterproof enclosures

RESULTS
Successfully submitted proposal to NASA and received feedback.
Past Projects: ThinSat
ORGANIZED BY VIRGINIA SPACE

ThinSat is organized by Virginia Space, in partnership with Twiggs Space Lab, Orbital ATK, and NASA Wallops Flight Facility. We launched several types of rapid prototype circuit boards into space to determine which ones are able to function in the extreme environment of open space.

SKILLS
CAD, 3D printing, PCB design and manufacturing, RF communications design, fluid mechanics analysis, microcontroller programming

TOOLS
Creo, KiCAD, EAGLE, Fritzing, Arduino, laser cutter, 3D printer, electronics shop, machine shop

RESULTS
Successfully completed the hardware build of the ThinSat payload. Presented design to the ThinSat program. Successfully launched into space on board an Antares rocket in February 2021.
Current Projects:
High-Power Rocketry
INTERNAL CLUB PROJECT

The high-power rocketry project is PRC’s longest-running project, currently in its sixth year. It is a great introduction to rocketry for students who want to take ownership of a hands-on project as soon as possible. With the mentorship from experienced rocketeers, 15+ members have already gained Level 1 rocketry certification through the NAR.

HPR team members also have the opportunity to lead project subteams tasked with building the electronics payload. The payload will collect flight data and transmit it to a ground station in real time.

LEAD
David Chang (ECE ‘24)

BUDGET
$2,500

SKILLS
CAD, 3D printing, PCB design and manufacturing, mechanical design, GUI/data transmission, Arduino, Raspberry Pi

TOOLS
PTC Creo, KiCAD, electronics shop tools, machine shop tools, Python
Current Projects:
Spaceport America Cup 2023
ORGANIZED BY SPACEPORT AMERICA

The SA Cup team will be designing and building a fiberglass rocket to be launched to 30,000 feet at Spaceport America in June 2023. The team is a fantastic opportunity for students to collaborate on a larger rocket.

This minimum diameter rocket will feature an 8.8lb scientific payload flying with an N3301 motor. Students will have the opportunity to work in sub-teams specializing in airframe, propulsion, avionics, and payload.

LEADS  Candace Do (MAE ‘24), Khoa Le (MAE ‘24)

BUDGET  $15,000

SKILLS
CAD, 3D printing, PCB design and manufacturing, mechanical design, advanced fabrication, simulation/trajectory estimations, fin simulations, motor simulations, stress simulations

TOOLS
PTC Creo, BurnSim, MATLAB, electronics shop, composites lab, OpenRocket, Fritzing, machine shop
Current Projects:
High-Altitude Ballooning Team
INTERNAL CLUB PROJECT

Our High-Altitude Ballooning (HAB) Team will build balloons strapped with GoPros and GPS sensors and launch them to 90,000+ feet.

The project involves designing and fabricating payloads from scratch. In the past, we have collaborated with the physics department to launch a particle detector to the upper atmosphere. Engineering-design goals and constraints will provide interesting and challenging aspects to each launch, such as maximizing data collection, achieving high altitudes, and minimizing cost.

The ultimate goal of this project team is to continue momentum through future semesters to eventually restart a HAB launch competition once ran by MIT & Stanford.

LEAD
Rishi Gorrepati (ECO ’25)

BUDGET
$2,500

SKILLS
CAD, PCB design and manufacturing, Arduino, design and fabrication of delectronic payloads, engineering design constraints

TOOLS
Fusion 360, electronics shop
Current Projects:
NASA RASC-AL Challenge 2023
INTERNAL CLUB PROJECT

The 2023 RASC-AL Competition seeks proposals for innovative mission plans extending humanity’s presence in outer space. This semester, our RASC-AL team will tackle the homesteading Mars competition theme. Team members will prepare a technical report detailing an in-depth mission plan for the long-term presence of astronauts on Mars, including Logistics, Entry-Descent-Landing, and Surface Operations.

This project will last up to at least the proposal submission deadline in March, with the potential for further technical paper submissions and a presentation if our team is selected.

**LEAD**  Mori Ono (MAE ‘25)

**BUDGET**  All costs covered if team advances

**SKILLS**  Research, technical writing, CAD

**TOOLS**  PTC Creo
Current Projects: Active Controls
INTERNAL CLUB PROJECT

The Active Controls project is seeking to make a thrust-vector-controlled rocket.

The project is achieving this by dividing into three teams: mechanical, electrical, and software. The mechanical team will design an actuated motor mount, the electrical team will be designing a flight computer with a complete avionics system, and the software team will develop the code necessary to read sensor data, allowing the rocket to adjust its orientation accordingly.

The project is currently in its early stages, and members are working toward a prototype with the goal of launching during the Spring 2023 semester.

LEADS
John Wallace (ECE ‘24)

BUDGET
$1,000

SKILLS
CAD, PCB design and manufacturing, Arduino programming, electrical and mechanical prototyping, controls

TOOLS
Autodesk Fusion 360, 3D Printer, Laser Cutter
Community Engagement

Community Rocket Launches
We hold several launches open to the University community as well as the Princeton community at large. Additionally, we hold launches with local homeschool groups where all the students had the opportunity to launch a rocket that they built.

In previous years, we taught over 100 people about the basics of rocket science through demonstrations and launches. During the virtual year, we continued to support the University community through virtual events such as workshops and tutorials.

Visiting Local Schools
We have reached out to over 300 elementary school students through launches and demonstrations at the Wilberforce School and at Riverside Elementary School as part of their annual Science Day.

Media/Press Coverage
PRC has been featured in the following publications:
Princeton University ODUS newsletter:
https://tinyurl.com/yczmsz5k
VICE Motherboard: https://tinyurl.com/y8fxx2uw
Spaceport America: https://tinyurl.com/y9cc45yg
Princeton University: https://tinyurl.com/yyux2ff5
Community Engagement

Workshops
We’ve held rocket-building workshops for the University community and held occasional workshops for a local homeschool group. We’ve helped over 20 people construct low-power rockets as a way to teach them about aerospace engineering.

Inviting Speakers
We have invited several speakers to give a public lectures to our club over the years, including prominent aerospace professionals from industry and academia. In the past, we have had former industry CEO George Whitesides discuss the future of space travel and industry to our club. In addition, we recently participated in a panel with former NASA administrator and astronaut Gen. Charles Bolden and have hosted a number of professors to discuss their research.

Collaboration with SWE
We have a strong relationship with the Princeton chapter of the Society of Women Engineers, and for the past few years we have worked with them at their event for high school students each semester. Through presentations, demonstrations, launches, and activities we have taught over 400 high school girls about aerospace engineering.
The Flying Tigers

TEAM LEADS

**Spaceport America Cup: Candace Do**

Candace Do (MAE ‘24) is co-leading the Spaceport America Cup team. She is minoring in Computer Science and Robotics. She previously co-led the Test Stand sub-team of Spaceport America Cup, and outside of rocketry she is also involved in The Daily Princetonian and Club Badminton. She is passionate about commercial space and space exploration, and recently interned at Firefly Aerospace. Her other interests include cooking, photography, and hiking.

**Spaceport America Cup: Khoa Le**

Khoa Le (MAE ‘24) is co-leading the Spaceport America Cup team. He has interests in working with the aerospace industry and enjoys learning about aviation and aerodynamics.

**High Power Rocketry: Maria Heffernen**

Maria Heffernen (ECE ‘25) is a co-lead for the High-Power Rocketry team of the Princeton Rocketry Club. She served as a mechanical sub-team lead for HPR last year, and she is excited to get to continue to work with HPR. Outside of Rocketry Club, Maria is fascinated by robotics and space exploration and is pursuing a certificate in Robotics & Intelligent Systems.

**High Altitude Ballooning: Rishi Gorrepati**

Rishi Gorrepati (ECO ‘25) leads the High-Altitude Ballooning team, where members launch weather balloons and accompanying payloads to nearly 100,000 feet high. In addition to Economics, Rishi has certificates in Finance & Urban Studies. In his free time, Rishi enjoys swimming, playing spikeball, and finding cool maps!

Leads listed here are those who do not also hold officer positions
The Flying Tigers
OFFICER CORP

President: John Wallace
John Wallace (ECE ‘25) is the President of the Princeton Rocketry Club and leads the club’s Active Controls team, which he also lead during his freshman year. John is passionate about all things rocketry and robotics, especially the intersection of the two. As such, he enjoys following advancements in the commercial space industry and autonomous vehicle research. Outside of these interests, John loves spending time with his two dogs and is a diehard Yankees fan.

Treasurer: David Chang
David Chang (ECE ‘25) is the Treasurer of the Princeton Rocketry Club and a co-lead for the High-Power Rocketry team. David holds interests in robotics, electronic devices, sustainable energy, and mathematics. During his freshman year, David earned his L1 rocketery certification through the Princeton Rocketry Club and served as one of the electrical sub-team leads for that launch. This year, David is continuing on as one of the co-leads of the High Power Rocketry Team.

Business Development Officer: Bryan Alfaro
Bryan Alfaro (MAE ‘24) is the Business Development Officer of the Princeton Rocketry Club. In addition to Mechanical and Aerospace Engineering, he is pursuing certificates in Applications of Computing and Robotics. He joined Rocketry Club because he was passionate about learning how to apply engineering concepts to actual projects. In PRC, he's been a part of the HPR, SA Cup, and Active Controls teams. Apart from rocketry, Bryan is also involved in Engineers Without Borders and Brazilian Jiu Jitsu.
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SEDS Officer: Gavin Cotter
Gavin Cotter (MAE ’23) is the Students for the Exploration and Development of Space (SEDS) Officer of the Princeton Rocketry Club. Gavin has interests in robotics, space exploration, and economics. During his freshman year, Gavin earned his L1 rocketry certification through the Princeton Rocketry Club and served as one of the electrical sub-team leads for that launch. Last year Gavin worked as the High Power Rocketry Team lead.

Speaker Officer: Mori Ono
Mori Ono is the Speaker Officer and the lead for the NASA RASC-AL Competition team. He has previously worked on the Spaceport America Cup and High-Altitude Ballooning teams. Outside of Rocketry Club, he is also part of the leadership for the Princeton Model United Nations Conference. He is passionate about the applications and implications of space development and settlement for socioeconomic development on Earth. He also holds various other interests in aerospace-related topics, such as spacecraft systems, as well as interests in railways, political economy, and travel. In his free time, he enjoys playing electric guitar, drinking boba, and singing.

Outreach Officer: Ben Kim
Ben Kim (MAE ’25) is the Outreach Officer for the Princeton Rocketry Club. Ben's primary interests lie in space, aviation, and environmental systems. In past semesters, he's worked on payload operations for SA Cup. On campus, he sings as a tenor in the acapella group Roaring 20 and has served as a Community Action orientation leader.
The Flying Tigers
OFFICER CORP

Social Officer: Rena Feng
Rena Feng (ECE ‘26) is the Social Officer for the Princeton Rocketry Club and is also a part of the Spaceport America Cup team. She loves working on and learning about anything related to mechatronics and enjoys studying languages in her free time.

General Officers

Harsha Dheekollu (MAE ‘25)
Anya Miller (ECE ‘25)