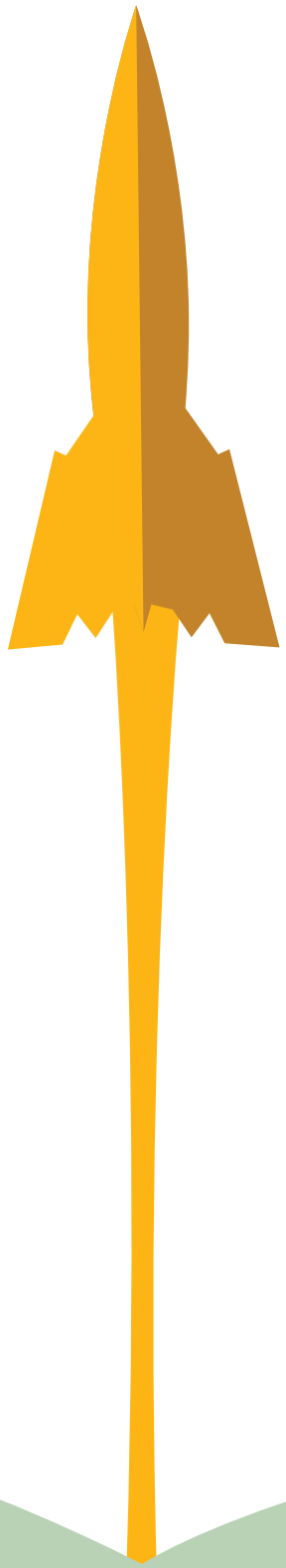

CalSTAR

sponsorship opportunities

Thank you!

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Carly Pritchett,
CalSTAR President

Contacts

President	Carly Pritchett	cpritchett@berkeley.edu
Vice President	Brunston Poon	brunston@berkeley.edu
Outreach	Adam Huth	ajhuth1@berkeley.edu
Logistics	Aaron Togelang	atoge1@berkeley.edu
Budget	Jia Yap	jiazhen@berkeley.edu

Our Mission

Research

As a Space Technologies team, we have subteams designing and testing new parts and processes for use in launch vehicles. We are currently focusing on designing innovative dynamic control systems, manufacturing and testing processes, electronics and telemetry, and propulsion systems. Some of these projects include active attitude control using actuated fins, long range radio communications, and small scale electric turbopumps for liquid propulsion systems.

Application

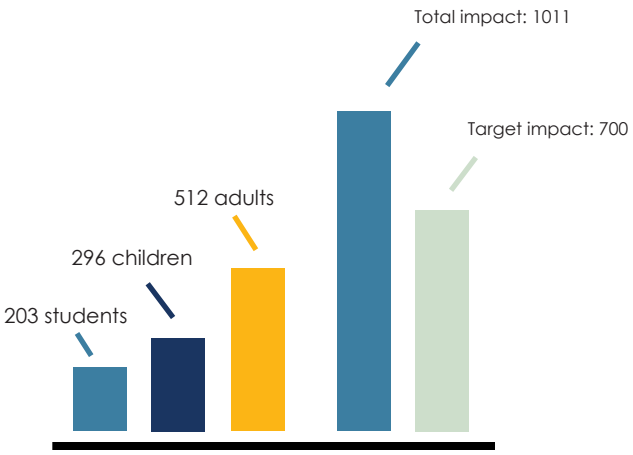
CalSTAR serves as the leading organization at Berkeley for hands on experience with engineering for extreme environments. Our members gain practical knowledge of software and hardware provided by sponsors. Through the collaborative design and manufacturing of innovative rockets and payloads, we prepare our members for future roles as professional engineers.

Community Outreach

A core mission of CalSTAR is to educate and inspire a love for STEM within our community. We host and participate in several outreach events where we meet and interact with local children, teachers, and makers. At all our events, we demonstrate the science and technology behind rockets and give people the chance to try out our interactive exhibits.

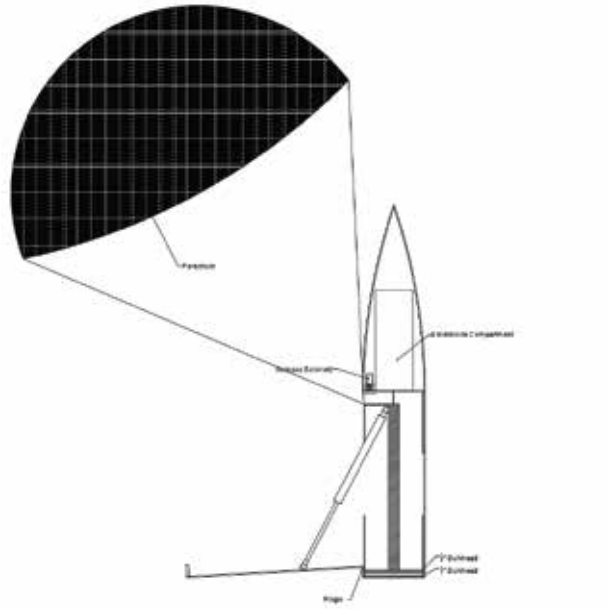
Past Year

Outreach



In November, we hosted an event with Habitat for Humanity where we helped children design and launch bottle rockets. In March, we participated in an outreach event held by UC Berkeley called Engineering for Kids where we hosted an egg drop activity where elementary schoolchildren built and tested recovery capsules designed to protect a fragile egg (pictured above). In May, we held a similar event at the Maker Faire in San Mateo. At the Maker Faire and throughout the school year, we also reached out to many adults and college students including UC Berkeley students and alumni, spreading awareness of our presence on campus and the emerging aerospace community at UC Berkeley.

Research



We have done research on dynamic airframe systems integrated with the recovery system of the rocket. Our payload for the 2017 NASA Student Launch competition featured such a system. It included landing legs that functioned as structural components of the airframe during flight. During descent however, the legs were deployed, exposing the interior section of the payload which housed three parachutes. The deployment of the legs allowed the parachutes to pull free from the airframe and inflate, slowing descent and stabilizing the payload so that it landed on the legs when reaching ground level (early designs pictured left).

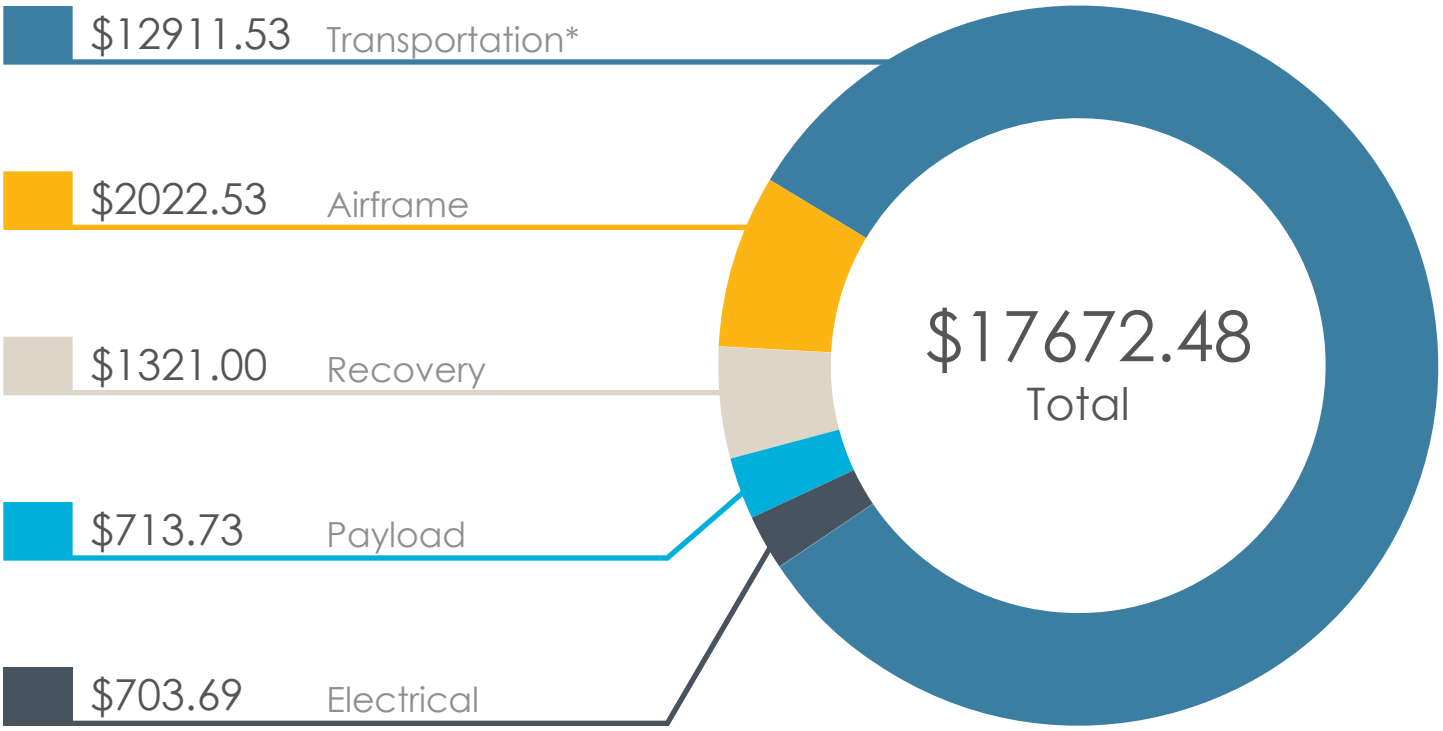
Competition

CalSTAR made its competitive debut at NASA Student Launch in April 2017. Of the three payload challenges, we attempted target detection and upright landing, which involved tracking several colored targets on the ground during flight, and then landing the payload section in launch orientation.

This competition is heavily structured and requires 5 reports over the course of the design period. These reports are typically 25-50 pages long and are thoroughly examined by NASA Engineers. This gives the members an oppurtunity to experience what a real world design cycle will be like.

Measuring 103” in length, 6” in diameter, and sporting an Aerotech L1150 motor, our competition rocket (URSA Major, pictured left) was successfully launched three times between January and April, the last of which was our competition launch in Huntsville, AL (pictured below). It used a dual-deployment parachute system with a drogue chute deploying at apogee and a main chute at 1000’ AGL. During descent, we used a nose-cone-mounted camera and a Raspberry Pi to perform the target detection algorithm, before deploying several landing legs and ejecting the payload and nose-cone from the main body around 600’ AGL to land upright.

Budget 2016-2017

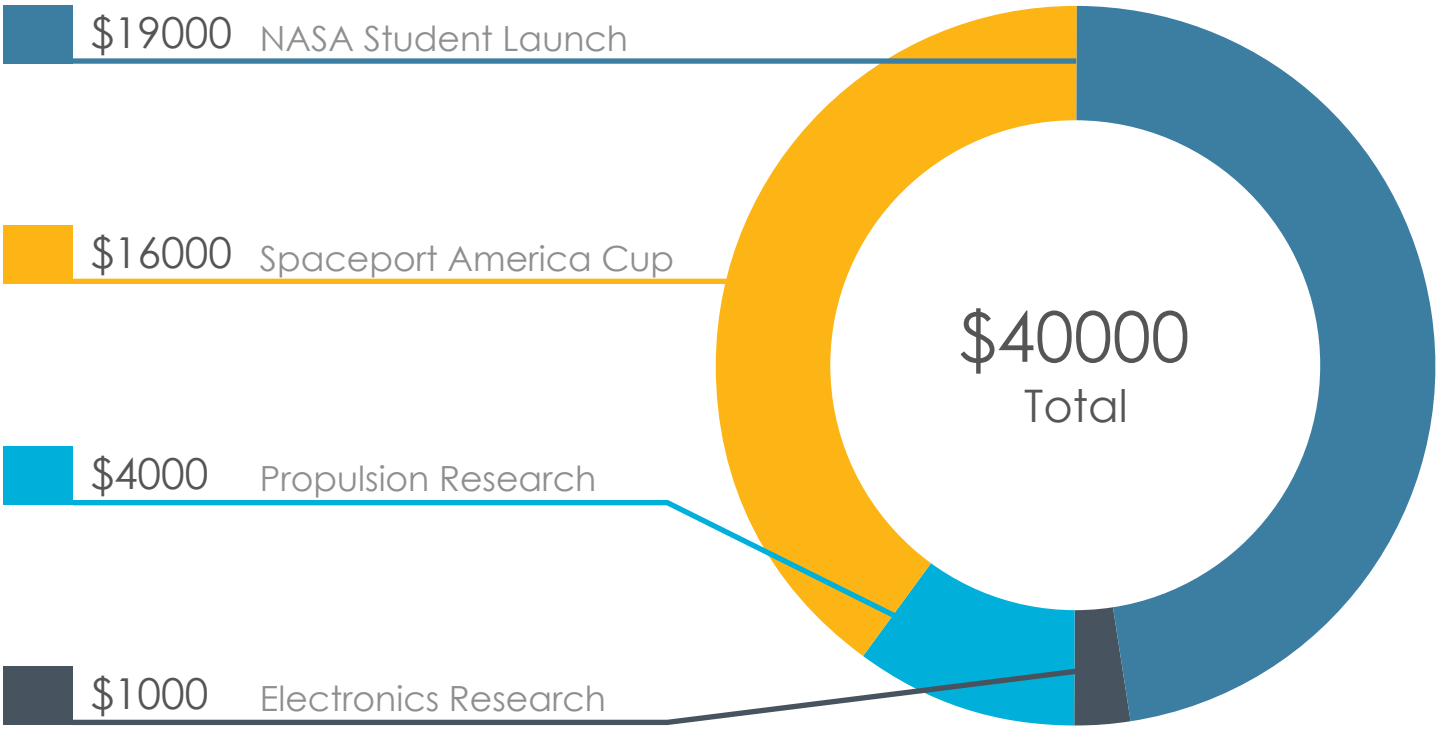


* Category also contains $150 in Outreach Expenses and $39.50 in Safety Expenses

Our total expenditure this past year was $17,672.48, comprising $4,760.95 in parts and manufacturing and $12,722.03 in all other expenses (transportation, outreach, and safety).

The majority of parts and manufacturing costs came from building the airframe and buying off-the-shelf motors for our five launches. The greatest expenses for recovery were the five parachutes required for both the main rocket recovery and the payload recovery systems. The transportation category includes the cost of plane tickets, hotels, and rental cars for the build team members who traveled to Huntsville for the NASA Student Launch competition.

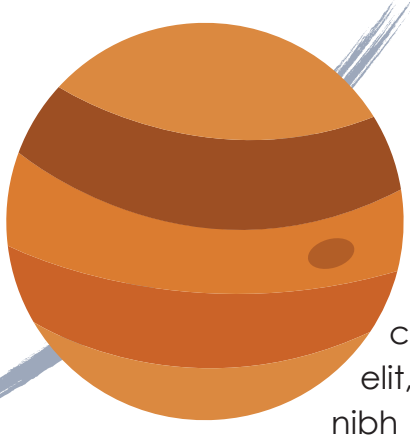
Projected Budget 2017-2018



This year, we intend on doubling our member count and taking on more projects. We will be participating in a second competition and engaging in more research. As such, our projected budget will be larger than our past expenditures. We are looking to fundraise about $40,000.

About half of our projected budget will go to the NASA Student Launch competition. The remaining half is split between the Spaceport America Cup, propulsion research, and electronics research. Besides competing in the two competitions, our propulsion team will be working towards developing a liquid bipropellant engine. Additionally, our electronics team will be working towards developing a custom flight computer with the features and capabilities required to launch, recover, and perform payload and staging tasks for a high powered rocket.

Sponsorship Tiers



Jupiter

5,000+

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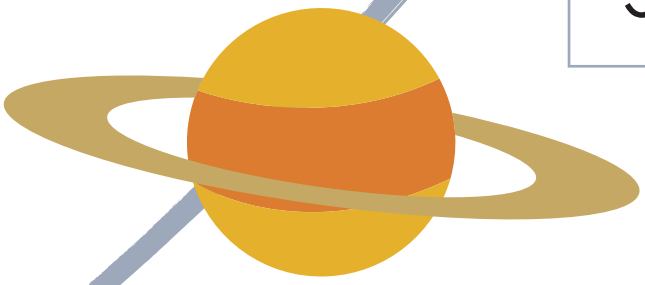

Saturn 3,000+

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Uranus 1,000+

Neptune

500+

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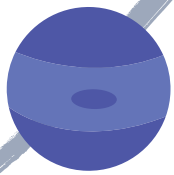

Sponsorship Tiers