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ResistoJets Rocketry Club of Morris County 4-H  
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<https://nj4h.space/club-sponsors/>

To Whom It May Concern  
Sponsorship Application  
7.25.2023

### **ResistoJets Rocketry 2023-2024 Request for Support**

The ResistoJets Rocketry 4-H Club, a non-profit 501(c)(3) organization of dedicated middle-school to high-school students based in Morris County, New Jersey, is actively seeking support for our participation in the NASA Student Launch Initiative (SLI) in the 2023-2024 season. We're working hard to bring about the next generation of engineers and scientists by providing opportunities for hands-on real world challenges.

Our club's main project involves participating in NASA's Student Launch Initiative (SLI). The SLI is a competition that engages students in real-world engineering processes. This includes designing, building, and launching a reusable rocket with a scientific or engineering payload while following the 9 month engineering lifecycle structured by the NASA panel. This includes delivering 5 milestones, including a proposal, several reviews throughout the season, and a final post-project review. By participating in this program, our members gain invaluable hands-on experience by simulating the roles of subcontractors for NASA. One aspect of the SLI competition includes running a STEM Engagement program reaching a minimum of 250 youth in a direct, hands-on, way. Last season, our team greatly exceeded this requirement, reaching over 1000 people in our community and beyond.

Our achievements in the past years speak to our dedication and capability. Our team has successfully competed in SLI as well as The American Rocketry Challenge (TARC). During the 2022-2023 SLI, our team was selected as one of 18 winning proposals in the High School/Middle School national division. Our project involved building a nearly 8-foot tall rocket capable of lifting a payload to an altitude of 4,000 feet. Additionally, we won the 17th overall place in the nation during the 2021-2022 TARC, qualifying us to participate in the SLI for the following years.

We are seeking financial, travel, facility, and/or material support for our coming competition season. This support is necessary for us to continue being a competitor in SLI, to continue our STEM Engagement programs, and to enable our members to continue learning through this invaluable education enrichment experience. The impact of your sponsorship would be significant, directly benefiting our team and contributing to the success of our mission in the Student Launch Initiative. In recognition of your generous support, we can offer various modes of representation.

Thank you for your consideration and support to help keep ResistoJets Rocketry alive.

Sincerely,  
Sean McConoughey

# ResistoJets Rocketry 2023-2024 Request for Support



## 1 Background

### 1.1 Club Formation and Growth

ResistoJets Rocketry 4-H Club was established in 2021, beginning with just two members from Morris County, New Jersey in order to host our team to compete in the American Rocketry Challenge. Since our beginning, we've grown in both size and stature, becoming one of the top middle-school and high-school rocketry clubs open to local youth to immerse themselves in the field of rocketry, engineering, and adjacent fields necessary for the success of our competition teams. We currently have 14 members competing in the NASA Student Launch Initiative (SLI) and The American Rocketry Challenge (TARC). We continue to grow our club in order to expand our abilities as a whole and to ensure the longevity of the club and its goals. Our club is a part of Morris County 4-H, a part of the wider 4-H and Rutgers Cooperative Extension, and as result of this we are a non-profit with 501c3 status.

### 1.2 Club's Core Principles

Our club exists on the principles of inclusivity, dedication, and ambition. We welcome anyone from 6th grade and up who can make travel arrangements to our meetings, not restricting ourselves to Morris County or any one school. We believe that all students should have the opportunity to push themselves as far as they can.

Our club members are dedicated to their projects, showcasing a strong commitment to learning and improvement. This is evident in our active participation in competitions and in the National Association of Rocketry Junior Level 1 High Power Rocketry Certification program. We strive to consistently push our boundaries and set higher goals for ourselves, contributing to our ambition as a team.

We emphasize teamwork and collaboration, where each member plays a vital role in contributing to our collective success. Our team members learn to communicate effectively, solve problems, make decisions collaboratively, ultimately preparing them for real-world challenges in STEM fields. In all competitions, it is a requirement set forth that club members will do 100% of the work required, including building and operating all hardware, writing all documents, delivering all presentations, and managing the rest of the team. There is adult supervision and assistance only for safety or administrative purposes.

Safety is the biggest priority in the rocketry community and that's reflected in all of the work we do. The SLI competition has rigorous safety requirements and deliverables that all teams must complete and follow to remain in the competition. This includes thorough risk analysis and mitigation, procedure writing, and operational safety. Rocketry is one of the safest hobbies in the country because of this deep culture of working diligently and carefully.

### *1.3 Past Achievements*

Our club was created 2 years ago with the goal of competing in the NASA Student Launch Initiative (SLI), which we were required to qualify for through placing in the top 25 The American Rocketry Challenge. Competing against nearly 800 other teams for the first time to achieve this was a tall order, but we were able to secure 17th place in the national finals. With this, we were able to compete in SLI the following season. In September of 2022, we submitted our proposal into SLI and were accepted as one of 18 teams in the middle school and high school division. Since then, we completed all necessary deliverables for SLI and in April 2023 made it to the competition finals in Huntsville, Alabama hosted by the Marshall Space Flight Center. Our project involved building a nearly 8-foot tall rocket capable of lifting a scientific payload to an altitude of 4,000 feet. Our team was the only team from New Jersey and represented our club and sponsors proudly.

In the 2023-2024 NASA SLI Season, our team won 1st place in the Social Media award in the High school and Middle school division. Throughout the existence of our club, we've had a very strong social media presence through [YouTube](#), [Instagram](#), [Facebook](#), and [Flickr](#). Coupled with that, we have also appeared on [News 12](#) several times, highlighting our accomplishments.

## **2 Project Details and Budget**

### *2.1 Upcoming project details*

Our upcoming 2023-2024 Student Launch project is characterized by ambition and growth. We plan to grow our team, expand our capabilities, and undertake a more complex payload design. The specific requirements will be dictated by the Request for Proposals (RFP) which is yet to be released, but we can anticipate certain core goals based on past years.

Project Roadmap:

- August: Finalize our team structure and await the release of the RFP from competition officials.
- September: Develop and submit our project proposal based on the RFP.
- October: Upon acceptance, refine our design and conduct preliminary tests and development.
- December: Construct and launch a sub-scale version of our main rocket, using the data collected to finalize the design of our full-scale rocket.
- January: Build, test, and launch our full-scale rocket and payload. We have several launch opportunities in the following months for additional test flights if needed.
- April: Travel to Huntsville, Alabama for the final competition week. Activities include safety checks, workshops, a rocket fair, and the final launch day. Throughout this week our team will be featured in various media opportunities, representing 4-H and our sponsors.

Additionally, throughout the 9-month competition season, we will maintain a strong presence on social media and carry out a rigorous public STEM Engagement program. These activities, while not directly related to the rocket and payload project, are critical components of our overall mission and participation in the Student Launch. They provide avenues for public engagement, education, and showcase of our work.

## 2.2 *Budget Overview*

In order to execute our SLI project successfully each year, we have a comprehensive budget that includes vehicle materials, STEM engagement materials, travel, and rocket launch items. While the specifics for our upcoming project aren't finalized, we expect our budget to be very similar to last year, with additional resources needed to support travel for the larger team. Below is a summary of our expenses that we presented to NASA in our last major engineering review milestone.

2022-2023 Final expenses as reported in the Flight Readiness Review (3/6/2023).

- Travel (5 team members accompanied by a parent to national finals): \$10,000
- STEM Engagement: \$2,347.07
- Full-scale vehicle hardware: \$1,137.75
- Rocket Motors (consumables): \$591.68
- Miscellaneous hardware: \$266.80
- Sub-scale vehicle hardware: \$77.54

Total: \$14,420.84

Last year's total budget excluding travel was \$4,420.84, which we anticipate to increase slightly this year with increased payload development and team recruiting. Additionally, while we're looking to improve how we handle travel in order to more effectively support a larger team, we still anticipate the total travel cost to be higher than last year.

To detail several of the pertinent resources for our team, we have compiled a list of tools or materials that we frequently use:

- 3D Printers
- Camera/filmmaking equipment (For mounting on our launch vehicles or ground coverage of our launches or other team activities)
- 3D Printing, CNC/Machining, or laser cutting services
- Flier, banner, and apparel printing services
- Travel and hotel services

- 3D Printer Filament
- Structural and laminating epoxy
- Fiberglass or carbon fiber cloth
- Kevlar cord (Shock cord lines that hold the sections of the vehicle together after parachute deployment. Typically in the park of 30 ft in length)
- Fiberglass rocket components (Such as airframes, bulkheads, couplers, or sheet G10)
- Parachutes (Parachutes from Fruitychutes or other manufacturers that produce parachutes with a coefficient of drag of 2.0 or higher.)
- Electronic hardware (Such as Arduinos, Raspberry Pis, control hardware, or high accuracy accelerometers or barometers)
- Rocket motors (K class for full scale, and likely H or I class for subscale)
- Bulk model rockets (for STEM Engagement)

While the specifics of what we will use in the coming year are undecided until the request for proposals is released and we create the first draft of our designs, these are all items we have relied on previously.

### **3 STEM Engagement and Request For Support**

#### *3.1 STEM Engagement and Outreach*

Promoting STEM education among youth and the wider community is a key part of our mission. Over the past season, we have conducted numerous STEM engagement activities with the support of 4-H and Rutgers University, reaching up to 1408 people across New Jersey in a hands-on and direct educational way. To briefly summarize our main program, we developed an education packet system which was accompanied by Estes rocket kits and motors. These packets were delivered to 30 schools and clubs in the state. We chose to create this system instead of a traditional approach of delivering workshops ourselves to have the broadest and widest reach we could with our sized team. Additionally, we reached 956 people through social media and other forms of indirect engagement. Our aim for the next season is to be more hands-on so that we can share our own passion with program attendees directly and leave a stronger impact. While we held some of our own in person events last season, ideally we would continue to do this with a larger audience and more frequently.

#### *3.2 Request for Support*

To continue our participation in SLI and additional project areas, we are seeking financial, travel, facility, or material support for our coming competition season. This support is necessary for us to continue being a competitor in SLI, to continue our STEM Engagement programs, and to enable

our members to continue learning through this invaluable education enrichment experience. The impact of your sponsorship would be significant, directly benefiting our team and contributing to the success of our mission in the Student Launch Initiative.

Our club relies entirely on sponsor, community, and member support to survive and carry out its missions.

In recognition of your generous support, we can offer various modes of representation, open to discussion with each individual sponsor. In the past, all sponsors have been recognized on our website and featured on our team shirts (seen on the official NASA coverage of the event). Additionally, several sponsors have been featured on our full-scale rocket, visible in most launch pictures and coverage of our team.

The ResistoJets Rocketry 4-H Club of Morris County is a ST-5 non-profit and holds 501(c)(3) status through Rutgers University, the central organization of 4-H in New Jersey.

Please send inquiries to Sean McConoughey at [resistojetrocketry@gmail.com](mailto:resistojetrocketry@gmail.com)

Thank you for your consideration and support to help keep ResistoJets Rocketry alive.



### **Discover ResistoJets Rocketry 4-H**

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*Notes:*

*While we typically fundraise at the start of or during each season, excess funds from each year carry over and continue to support the SLI team's mission, as they belong to the club and its financial structure, and aren't tied to the SLI competition season in any way.*

*Even though SLI is our main focus, our club is also open to support for our TARC team and the general club.*

*4-H Youth Development programs are offered to all youth, grades K-13, on a grade appropriate basis, without regard to race, religion, color, national origin, gender sexual orientation or disability. All possible efforts will be made to include rather than exclude youth in events conducted by the 4-H Youth Development program.*