



# SOCIETY OF PHYSICS STUDENTS

An organization of the American Institute of Physics

## Marsh W. White Award Proposal

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Project Proposal Title	Comet Rocket Competition 2020
Name of School	The University of Texas at Dallas
SPS Chapter Number	7258
Total Amount Requested	490.98

### Abstract

Student teams from the University of Texas at Dallas will be able to spend time crafting, decorating, and launching model rockets in order to compete against one another and learn more about how physics impacts the world around them in a hands-on environment.

# Proposal Statement

## **Overview of Proposed Project/Activity/Event**

Our proposed event is to put on a model rocket launch competition, with time and materials set aside for student teams to build and compete against one another, while also learning about how rockets function and the physical world surrounding these functions. We hope the project will inspire and give students the opportunity to find their inner tinkerer and as a result, see physics as something that is real and tangible, not just a list of formulae. It is also our hope to foster camaraderie among the students of the physics department. We intend to present this event as an opportunity for anyone interested in physics, engineering, or rockets.

Our chapter has a very high percentage of freshmen and sophomore students. Often, these students have not yet taken courses that allow them to "experience" physics in the form of research and projects. Participating in an event like this would allow such students to work with their hands and encounter physics in a very practical, fun, way. Similarly, students who are not dedicated "physics students" can learn a bit more about the physics of rockets, while having fun and being exposed to SPS as an organization.

Beyond undergraduate students, even graduate affiliates of SPS and professors of our department have been vocal at their interest in helping and attending a model rocket launch. We hope that this will provide a greater sense of community in our physics department and be a memorable time for all involved.

## **How Proposed Activity Promotes Interest in Physics**

This event is designed to be both fun and accessible to students with any form of background knowledge of physics. Students will not need experience in physics to appreciate and join in on the event, but all who participate will have the opportunity to learn more about rockets and physics. By using intermediate model rocket kits we start all groups on equal footing in terms of material available to them, while also allowing them the freedom to go beyond the base model and make improvements that they think might give them 'an edge' against the competition. With the aid of our SPS officers, and a bit of instruction lent by our advising professors, students will be able to learn the key aerodynamics and physical principles of rockets, and use their own ingenuity to create something with this knowledge.

Of course hosting this event carries with it an upfront cost per kit, which would either be a bulk sum on the shoulders of our SPS chapter, or as an individual entrance fee per student (in either case the number of students able to participate is limited). Both of these are barriers to entry for an otherwise amazing opportunity, not only for our active SPS members, but for their friends, as well as any student who simply thinks that creating a rocket and launching into the sky would be a great way to spend a few hours over the course of a month. This Marsh White award would allow us to remove these financial barriers, while also going "all out" to bring a bit of fun and physics to a large group of students on campus.

While the building of rockets and provided supplies will be intended for participating university students, we plan on promoting the launch itself to the greater community both on and directly off campus. This is to provide students with a greater sense of accomplishment for their creation, and to open the prospect of physics to a larger crowd of interested residents. This form of public outreach is not unfamiliar to our chapter of SPS, as we have done similar public invitations for telescope nights and other "large" events.

## Plan for Carrying Out Proposed Project/Activity/Event

The UTD SPS officers will oversee all planning and running of the event. We will work alongside Dr. Jason Slinker, our faculty advisor and a physics professor, to assure that there is university oversight on the carrying out of the event as needed. Through bi-weekly officer meetings we will coordinate promoting, organizing, and running the rocket launch.

The rocket launch will be promoted through three main channels: physics classes, student organizations, and media. To successfully promote in classes we will ask our officers to contact the professors of their physics classes with a request to make a brief announcement about the rocket launch. As SPS officers, we will communicate with other physics-related student organizations on campus to advertise the competition with their members. Furthermore through social media posts, mass emails to the UTD physics students, and poster advertising around campus we will make sure to alert the entire campus community to the event

SPS officers will primarily be involved in the promotional and the day-of management phases of the event. As explained in our marketing description, we will involve SPS members in the in-class promoting of the rocket launch. We will coordinate communication between SPS members and the professors of their physics classes to ensure that members can make an announcement to their peers in their respective classes. Additionally, since we will be advertising the rocket launch to the university community as a whole we hope for over 200 viewers and participants to attend the event. With such a large number of attendees we will need members to help in running and overseeing the event. These member tasks during the event include crowd management, rocket judging/rules enforcement, and crowd involvement. Furthermore, we will encourage SPS members to build their own rockets to enter into the competition.

To ensure the success of the rocket launch competition we will work alongside both Dr. Slinker and Dr. Anderson, another physics professor here at UT Dallas. Dr. Slinker has experience planning and hosting large events for the campus community and Dr. Anderson has experience with rocket competitions. Dr. Slinker will be our primary planning advisor and Dr. Anderson will be our primary event safety and rocket-building advisor.

## Project/Activity/Event Timeline

Beginning during January, officers of SPS will create and post fliers advertising the event around campus. These fliers will advertise two meetings set aside for teams to build the rocket, the date of the formal competition, and how to get in touch with our chapter of SPS with any more questions. As the date approaches officers will purchase rocket kits, as well as building supplies, while also working with campus affiliates to reserve a suitable outdoor space for the launching of rockets.

The month of March will contain two “build meetings” wherein interested students will be able to form teams (if they do not show up in pre-formed groups) and gather supplies supplied by the officer team. Officers present at the meeting will then go over the physics of a [model] rocket, details of how the competition will be scored, and give instructions on how to start construction of a model rocket. While teams are working to build their model rocket, officers will then go about helping as needed. The second meeting will be a repeat of this, with an extra area set aside for decoration of rockets, and finishing touches.

UTD Rocket competition will occur the week of April 6th (likely on the 7th, weather permitting). Teams will arrive and check in, with time before the competition officially starts to eat, mingle, and set up before judging of the rockets occurs. Officers, Advisor, and any members unaffiliated with a competing team will then judge the rockets based on artistic design, school spirit, and physics spirit. Each winner of these categories will get a minor prize, while a more formal “trophy” will be reserved for the team whose rocket flies the highest. Teams will then take turns launching their respective rockets while SPS officers and Advisor record altitude measurements to determine the “winning” rocket in terms of height covered. The winning team will then be awarded their trophy and teams will be allowed to keep their rocket/debris.

## Activity Evaluation Plan

The goal of the UTD Rocket competition is to increase campus-wide participation in the UTD physics scene. Whether the event results in an increased number of undergraduate students participating in physics research on campus, attending the weekly physics colloquia, or by another metric, the rocket launch will have been a success. Though these goals are the end desire, we will measure a few observables to gauge success.

During the promotional phase of the event, we will aim to include other organizations on campus whose members are interested in physics but are not involved in the on-campus physics scene only due to a lack of information. By working alongside these clubs and groups, we can provide information and avenues to get involved to the students who do not know how to become active. We will gauge promotional success by contacting and advertising the rocket competition with at least 5 other organizations.

As the event is ongoing, we will collect contact information from all participants and observers of the competition. From this information we will have an extensive list of people who have already demonstrated an interest in physics.

Once the event has concluded, we will contact participants and viewers via email within two weeks to follow up on their experience. We will both ask questions about how they enjoyed the event and provide more information (such as dates for SPS meeting or other physics events on the horizon).

## Budget Justification

Our proposed outreach event for the Spring 2020 semester will be a Rocket Launching competition. This will consist of balsa wood projectiles being thrust at high altitudes that must have a safe place to land upon return. Given this, we thought it best to reach out to our university to find the best location. The best possible option for housing the event is on a vacated soccer field, out of the way of several of the university's largest buildings. Although the university will allow us use of the field for an allotted amount of time we have requested, it is not free. The total cost will be around \$140, but will ensure we have a safe and suitable location to launch rockets hundreds of feet into the air.

Another very important, and as a result the largest single item of the budget, is of course the rockets themselves. After speaking with a professor who has experience building model rockets for similar competitions (Dr. Anderson, mentioned previously), we have found a model rocket kit that should provide ease of entry, while also having room for improvements by our more ambitious attendees. That is, the models lend themselves to be made very easily and simply, while also having room for experimentation, minor alterations/additions.

We have also set aside space in the budget for the creation of the rockets, and drawing initial attention to the event. This includes additional building supplies for each team's rocket, namely extra balsa wood, sand-paper, glue, and paint. For advertising we plan to enlist our local student-organization center in making fliers as well as making announcements on social media and in classes. This service being provided on campus will help to keep the total cost of advertisements low, allowing us to stretch our advertisement budget further than if we used an outside company/service.

The final portion of the budget includes the cost of snacks during the "build meetings" (due to the length that students may spend at each), lunch at the competition itself, and prizes for our winning teams. We hope that having these will incentivize more teams to participate, and give the event the feeling of a true competition. Meetings will- in accordance with our university's policies- likely have small snacks and pizza, in part subsidized by our officers. The launch itself will have more pre-packaged snacks and water to alleviate the Texas spring heat. Medals and a small trophy will also be commissioned for our winning teams, which will be a minor cost, but a worthwhile one for the overall spirit of the event.