



**SPONSORSHIP BROCHURE  
(2019-2020)**



Dear Friends, Colleagues, Classmates, and Sponsors,

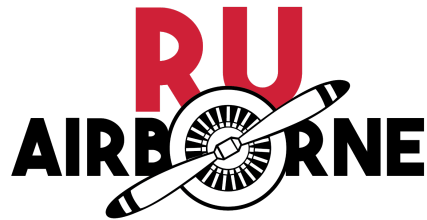
We are the Rutgers University chapter of the American Institute of Aeronautics and Astronautics (AIAA). The Rutgers AIAA is a non-profit student organisation that is the leading group for students interested in topics related to aerospace across campus. Each year, our members take our organisation to new heights. We welcome you to join our journey this 2019-2020 school year as we continue to innovate and tackle greater challenges. Within the School of Engineering at Rutgers, we pride ourselves on the fact that we help many motivated students get an in depth understanding of what engineering is all about outside the classroom. We are proud that our members go on to do great things in the fields of engineering and beyond. None of this is possible without the tremendous amount of support we get from our university, our advisors, our members, and our amazing sponsors.

The field of aerospace incorporates many different facets, and so as we grew in membership, new teams were started to accommodate different interests. We now have three main teams that participate in three main international competitions. Our AirBorne team participates in a competition called 'Design. Build. Fly.' hosted by AIAA, our Autonomous team participates in the 'AUVSI SUAS' (Association for Unmanned Vehicle Systems International's Student Unmanned Aerial Systems) competition, and our Rocket Propulsion Laboratory participates in the annual 'SpacePort America' Cup. We continue to excel in all of our competitions, learning from previous years and making a name for Rutgers Aerospace throughout the circuit.

In remembering the reason this organisation was started, we also operate a Flight Training Club. The FTC provides our members a chance to kick back and do something fun while learning a lot in the process. Some of our more experienced members teach the rest of the club how to fly remote controlled aircraft. We also help club members get licensed, and aid the competition teams during some of our frequent fly days. Apart from our projects, RU-AIAA is also very involved in the university and in the local community. We coordinate with other groups on campus to host a number of events, we run concessions stands at football games, we do events with local New Brunswick schoolkids to get them interested in pursuing STEM, and much, much more year-round. We would love having you on board as we take to the skies this year!

Best,

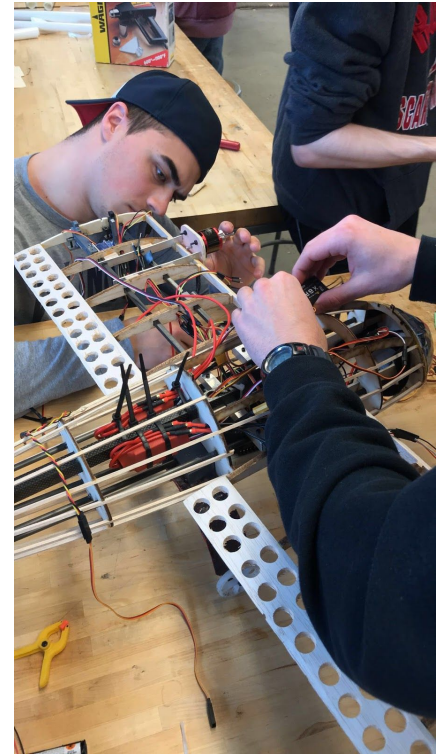
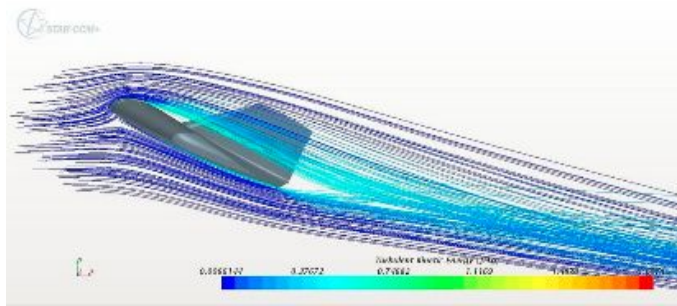
Ruchita Sinha	Vignesh Sridhar	Michael Higgins	Matthew Ramina	Alexander Sanducu
President	Vice-President	Team Lead	Team Lead	Team Lead
		AirBorne	Autonomous	RPL



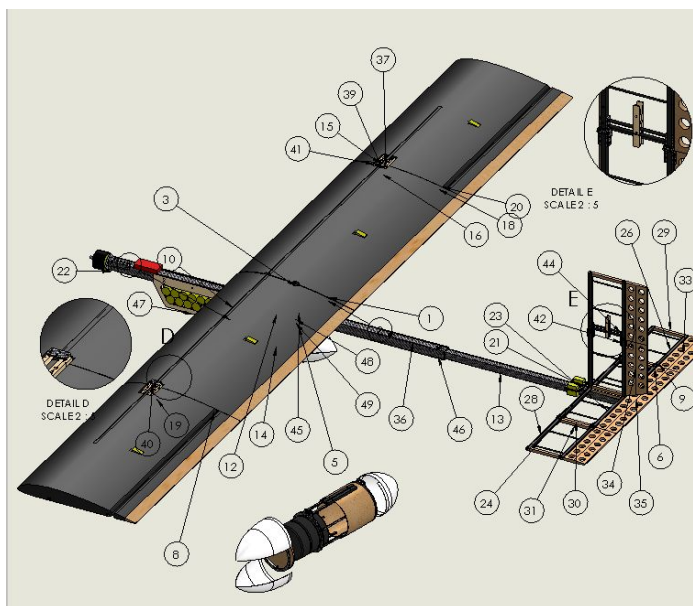
**RU Airborne** is a competitive RC aircraft building team that participates in the AIAA Design-Build-Fly competition. Every September, the team is given a set of design parameters from which they must design and build a remote-controlled aircraft. Over the years, they have been challenged with designing scale models of long-range passenger aircraft, fighter aircraft, and ultralight aircraft.

Work starts over the summer, with the team modifying their previous design process to improve team efficiency and performance. During the fall semester, they thoroughly evaluate the new design constraints and begin to confront the major technical challenges of that year's aircraft. The team submits a proposal based on their preliminary design, mirroring a process commonly found

in the aerospace industry. Meanwhile, new team members, which hail from a variety of engineering backgrounds, are trained and equipped with fundamental engineering tools that will help them to become valuable team members and better engineers. Prototypes are built and modified to test various ideas, culminating in at least one full-scale test plane.



Learning from these experiences, the team reevaluates their designs, conducts more testing, and begins constructing the competition aircraft during the spring semester. In February, the team submits a design report that contains all of the technical details about their plane and design process. In April, their aircraft is judged based on its real-time performance in a fly-off with other planes designed by university teams and the criteria of that year's competition. Through the application of their academic curriculum and collective experience, RU Airborne attempts to innovate within the aviation industry and refine pre existing concepts to ultimately improve air travel from both a technical and economic perspective.







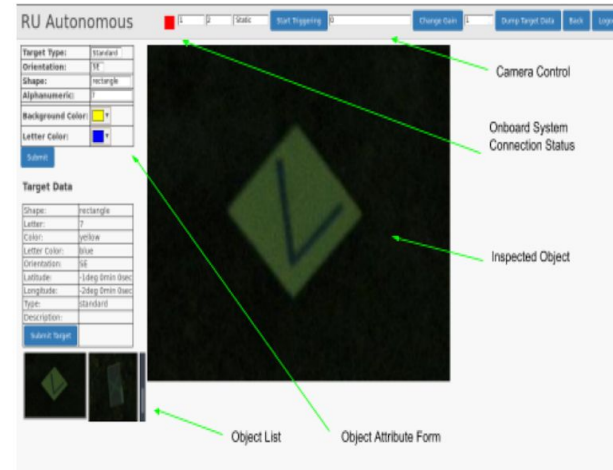
# RU AUTONOMOUS



**RU Autonomous** is a collaborative and engaging community built around the Association for Unmanned Vehicle Systems International Student Unmanned Aerial Systems (AUVSI SUAS) competition. The team works as an integrated unit of engineers to gain hands-on experience in aeronautics, autopilot systems, mechanical engineering, computer vision, and software engineering in a real-life scenario. After receiving the mission specification in October, the team designs and builds an autonomous aircraft to fulfill tasks that have included in recent years waypoint navigation, obstacle avoidance, target detection and localization, and aerial delivery. The year culminates in June when the team submits documentation deliverables and performs a

mission demonstration at NAS Patuxent River in Maryland, competing against university teams from around the world.

By the competition's nature, the team must take a multidisciplinary approach to recruiting, training, and design. The team hails from many academic backgrounds, including aeronautical engineering, electrical engineering, computer science, and mathematics. It gives students in the Rutgers School of Arts and Sciences the ability to branch into a more practical application of their education. The fully volunteer status of the team also allows us to be more open to members of all experience levels, as long as they carry passion and commitment to their learning. Finally, the team offers leadership opportunities through a board of subteam leads, who work to manage the technical direction and progress of individual systems and ensure the team is meeting its goals through real-world project management methodologies.



Last year's system was built from a commercial-off-the-shelf styrofoam airframe. From there, an ArduPilot-based autopilot module, camera, on-board image processing computer, radios, and landing gear were added to complete the vehicle itself. Air-to-ground communications were achieved using the MAVLink protocol, a Django web server, and a React client. Two TensorFlow-based computer vision models were trained to independently perform ground target detection and classification. Obstacle

avoidance was achieved by building an easy-to-use user interface and geometric methods to facilitate quick edits of the planned flight route before beginning the mission. The team also plans to introduce industry standards for its software systems, including more rigorous testing, continuous integration, and agile methodology.

*In 2019, the team achieved 12th place overall at the competition, including 13th place in the mission demonstration and 11th place for the technical video presentation, out of 75 total entrants.*



The **Rutgers Rocket Propulsion Laboratory** (AIAA RRPL) is an emerging and demanding student-led organization that teaches the principles of rocket design, propulsion engineering and manufacturing for the construction of supersonic vehicles. Enrolling into the membership of the National Association of Rocketry (NAR) and the Tripoli Rocketry Association (Tripoli) was a must and obtaining the proper documentation for building High Powered rockets was the beginning of an arduous and long journey of learning. Since summer 2018, we have competed in



the annual Spaceport America Cup that features over 110 teams from colleges and universities in eleven countries, held in Las Cruces, New Mexico in June of every year.

With so much proven knowledge in the private sector, our team is seeking to not only excel within the Spaceport America Cup but also become one of the first university teams to reach outer space and work to further space travel development. Joining our team entails a never-ending trial of perseverance, ingenuity and courage to push through obstacles. Reaching



Spaceport America Cup 2017 was brutal, and reaching the Karman Line for future space travel development will be as well. Our team uses currently available resources such as trajectory simulation, rocket motor certification and monthly rocket launches to test out new systems and iterate the design until perfection is reached.

Bringing up the next generation of rocket engineers at Rutgers University is our mission and advancing national

space commercialization is our goal. We plan to do this by teaching four primary aspects of rocketry prior to competition: Solid Motor Design, Liquid Motor Design, Electronics Integration and Reaction Control, and High Power rocket design. Each separate topic help each other in building an advanced rocket and for new members to get practice before competition they are involved in our L1 Program, which teaches the basics of rocketry through building basic High Powered rockets for motor certification. The Spaceport America Cup then tests the engineering ability of all members.



AIAA RRPL is planning to compete in the “30,000-foot apogee” division for either Components of The Shelf (COTS) or Student Research and Developed (SRAD) category for the 2019 Spaceport America Cup. In the COTS category, we are required to use commercial, off the shelf components (primarily a commercial motor) to construct all integral components such as: airframe, electronics, motor, and recovery systems. The SRAD category includes all rockets made with student constructed solid propellant motors, and does not include commercial parts. Across all competitions, the competitors are judged on rocket performance, report presentation, engineering ingenuity and exemplifying the spirit of engineering.



## **SPONSORSHIP**

Rutgers AIAA can be sponsored in a number of ways. We can be sponsored through financial means, which enables us to purchase materials/equipment, fund our activities, and help us compete at the various conferences we attend. Given our status as a non-profit organisation, all donations are **tax-deductible**. Sponsors may also choose (as many do) to provide us with materials and resources to manufacture our projects. This includes things like different parts, discounted prices on their products, and access to their facilities. Materials and resources will be counted at market value to determine the sponsorship option level. If they choose, sponsors may also specify which team they want their donation to be routed to. Sponsoring our team goes a very long way in encouraging a talented group of people to pursue a career in STEM fields. We are grateful to all our sponsors who remind us that the sky, indeed, is the limit.

### **Benefits of Sponsorship:**

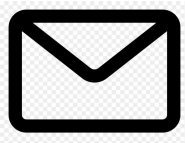
By sponsoring our team, your organisation will gain a considerable amount of local and international publicity given that we travel around the country showcasing our projects. Sponsors will have their logos displayed on our planes/rockets, on our website, and all sponsors will be mentioned on our social media platforms. Apart from this, sponsors are also benefited by:

- Tax-deductible donations
- Connection to a highly motivated and competitive group of undergraduate students, most of whom are on the lookout for internships and career opportunities
- Exposure to a school of 30,000 students, faculty, and the Rutgers Career Services department
- Exposure to industry professionals and leading professors and students hailing from across the world
- Rutgers AIAA also gives back to the community in various ways, your donations go a long way in doing things like motivating local school district students to pursue a STEM career

## Sponsorship Options:

	Signature (< \$500)	Bronze (\$500 - \$1000)	Silver (\$1000 - \$1500)	Gold (\$1500 - \$2000)	Platinum (\$2000+)
Promotional Access to Rutgers Career Service	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Recognition on Team Website & Team Photo	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Invitation to Team Fly day	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Lettering/company logo on competition aircrafts	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Company name advertised on team apparel		<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Promotional use of aircrafts for public exhibition				<b>X</b>	<b>X</b>

### CONTACT:



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