



SOCIETY OF AERONAUTICS AND ROCKETRY AT USF

THE SKY IS NOT THE LIMIT.

SPONSORSHIP INFORMATION



www.usfsoar.com

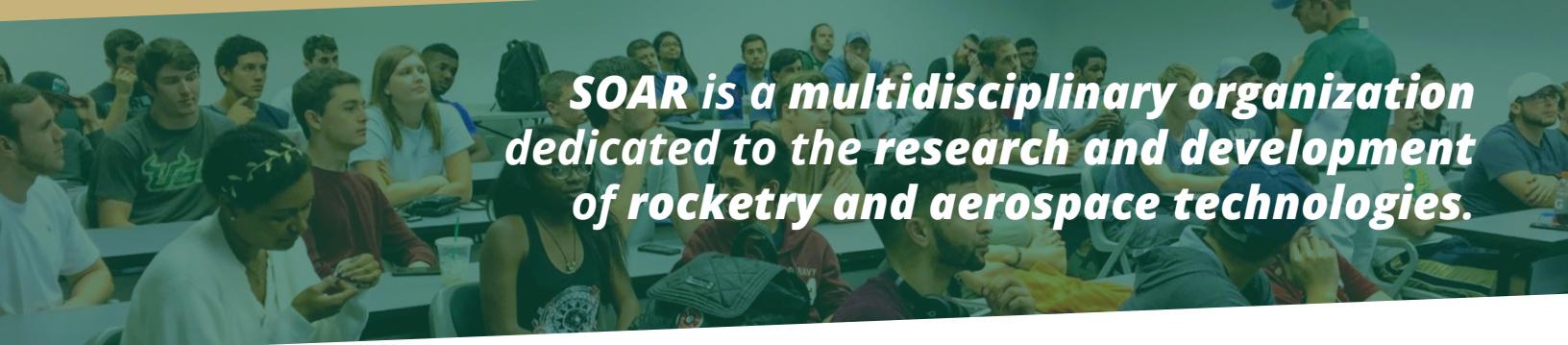
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Society of Aeronautics and Rocketry at the University of South Florida

19-20.b



ABOUT SOAR



SOAR is a multidisciplinary organization dedicated to the research and development of rocketry and aerospace technologies.

WHAT WE DO

The USF Society of Aeronautics and Rocketry (SOAR) at USF promotes engineering education, academic performance, and the advancement of the entire aerospace engineering field through participation in challenging competitions and projects. SOAR provides an opportunity for students from all majors and fields to enhance their knowledge in research, engineering, and other tangential skills pertinent to the aerospace industry as well as the operation of a large organization. SOAR is a professional and competitive research organization that produces industry-relevant data, innovations , and reports.

In recent years, SOAR placed 10th in the nation in the NASA Student Launch Initiative and 2nd overall in the FSGC Hybrid Rocketry Competition. Please see the following pages for a review of our current projects.

WHO WE ARE

SOAR consists of approximately 75 graduate and undergraduate USF students, divided into several project and competition teams. The organization is led by the Executive Board, including the President, Vice President, and Chiefs of Engineering, Finance, Rocketry, Operations, and Safety. SOAR is, by necessity, a multidisciplinary organization. Members include students of mechanical, chemical, electrical, and computer engineering; communications and marketing; finance; entrepreneurship; physics; mathematics; computer science; supply chain management; and more.



↑ SOAR's president, Javian Hernandez, and vice president, Jackson Stephenson, discuss plans for a liquid-fueled rocket.

THE SKY IS NOT THE LIMIT.

CURRENT PROJECTS

SPACEPORT AMERICA CUP / IREC

The Spaceport America Cup (also known as IREC) challenges university students across the nation to design, analyze, and build a high-powered rocket capable of carrying an innovative payload to an exact altitude. This year, our team has chosen to compete in the 30,000 ft category with a hybrid-fueled rocket.

To meet this challenge, SOAR is designing and building *Asterion*, a supersonic 6" diameter rocket built from fiberglass, carbon fiber, and aluminum. This vehicle will fly on the most powerful commercially available rocket motor - the Contrail O6300 Hybrid.

The payload will consist of advanced student-developed avionics hardware that will live-stream flight metrics to a ground station and fit inside the form-factor of a standard Cubesat. The rocket also features a modular ballast system, machined bulkheads, and removable fins.

TARGET ALTITUDE

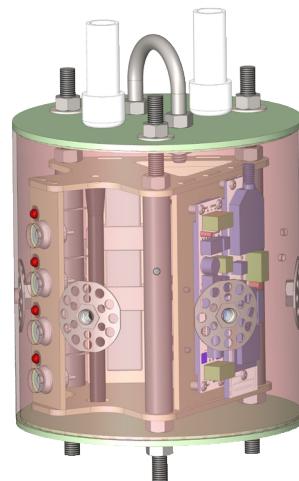
30,000 ft

MAX. THRUST

2,759 lbf

MAX. ACCELERATION

27.4 g



↑ Early custom PCB design for Asterion's data acquisition payload, which will fit into a Cubesat form factor.

LIFTOFF MASS

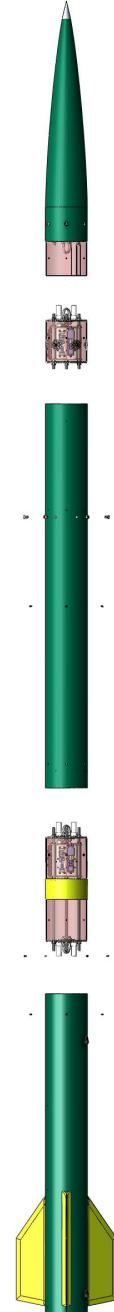
97.1 lb

TOTAL LENGTH

11.7 ft

MAX. VELOCITY

Mach 1.7



↑ Apis III, SOAR's entry in the 2019 NASA Student Launch competition.

CURRENT PROJECTS

↓ Concept render of the upcoming Cedar 9 liquid-fuel rocket.



The Base 11 Space Challenge is a national competition fueled by student innovation and extreme ambition. 60 university teams have entered this national challenge to become the first university to launch a single-stage, liquid-fueled rocket to the infamous Kármán Line (330,000 ft; the boundary of space) by 2021. The competition is hosted by Base 11, a nonprofit STEM accelerator, and sponsored by Dassault Systèmes, the creators of SolidWorks. Along with the prestige of becoming the first ever university team to launch a rocket to space, the competition carries a cash prize of \$1,000,000.

SOAR is developing an innovative, powerful launch vehicle which will be able to withstand the rigors of near-hypersonic flight and extreme acceleration under liquid propulsion. This massive vehicle, named *Cedar 9*, will feature an advanced ablative carbon fiber nozzle and will be fueled by nitrous oxide and RP-1. This propellant choice has been made with safety as the absolute priority. *Cedar 9*'s airframe features a unique aluminum semi-monocoque structure (where loads are born by both the structural frame and vehicle shell), allowing for an extremely lightweight but incredibly strong structure.

Several flow tests have been completed with a full static test stand under construction. A static liquid fire test is scheduled for December 2019 to verify SOAR's first-ever liquid rocket engine design. Development will continue at a rapid pace until the anticipated full-scale launch attempt in December of 2020.

EST. MAX. VELOCITY

Mach 4

PROPELLANT

N_2O & $\text{C}_2\text{H}_6\text{O}$

TARGET ALTITUDE

330,000 ft

EST. LIFTOFF MASS

1,260 lb

BASE 11 SPACE CHALLENGE



↑ A successful flow test using water provides key data to characterize the custom-designed engine and nozzle.

CURRENT PROJECTS

TRA CERTIFICATION PROGRAM

Education is primary among our many goals at SOAR. Our guiding organization, the Tripoli Rocket Association, recognizes three levels of certification, each authorizing the rocketeer to launch ever more powerful rockets. To this end, SOAR conducts free Level 1 and Level 2 Certification build classes to help members learn the basics of rocketry and build a strong base of knowledgeable members. This endeavor is paramount to the success of our organization as it transmits knowledge and skills that might otherwise be lost as members graduate.

↓ SOAR members learn basic rocket engineering skills and earn a national certification by participating in our training program.



TWO-STAGE ROCKET

Taurus 1 is SOAR's most advanced rocket design created to date. This fully custom-designed and fabricated 24' tall rocket (that's taller than a two-story house!) features two separate stages and can reach altitudes of nearly 40,000 ft. The powerful motors require a carefully designed staging system and an extremely strong airframe. The rocket provides a stepping stone for SOAR to progress from mid-level high-power rockets towards the ultimate goal of reaching the boundary of space. This rocket was completed and launched in the summer of 2019.

OUTREACH

Educating and inspiring future engineers is a core belief in this organization. As such, SOAR conducts or participates in dozens of outreach events every year, including the Great American Teach-In, ROBOTICON, Manatee County Engineering Day, USF Student Organization Showcases (which highlight possibilities for potential future USF students), and collaborations with the Museum of Science and Industry and the Girl Scouts.



↑ SOAR members introduced more than 180 Girl Scouts to engineering through hands-on rocketry activities in 2018-19.

YOUTH IMPACTED IN 2018-19

2,688





SPONSORSHIP BENEFITS

Becoming a sponsor of SOAR has many benefits, whether you are an individual or an organization. Several pre-selected benefits packages are available below, as well as some "add-on" options which can be selected individually. Of course, all benefits are negotiable. Both monetary and in-kind (material) contributions are greatly appreciated. Benefits last until the end of the fiscal year.

AVAILABLE PACKAGES

*All donations are tax deductible.**

SPORT PILOT

\$100 - \$1,000

- Social media promotion
- Company link and logo featured on SOAR website
- Company logo featured in presentations and videos

AIRLINE PILOT

\$1,000 - \$2,500

- All "Sport Pilot" benefits
- Companies: Small logo on all rockets
- Individuals: Name printed on all rockets

FIGHTER PILOT

\$2,500 - \$5,000

- All "Sport Pilot" benefits
- Medium logo or name on all rockets
- Logo or name on banners and apparel

ASTRONAUT

\$5,000+

- All "Sport Pilot" benefits
- Customized SOAR plaque for permanent display
- Large logo or name on rockets and apparel

'À LA CARTE' (ADD-ON) OPTIONS

\$1,000	Prime logo location on rocket center of gravity
\$1,500	SOAR recruiting event
\$6,000	Rocket naming and livery design rights

* Tax-deductible donations are made to the USF Foundation, a 501(c)(3) non-profit that acts as a proxy for SOAR.

CONTACT US

Thank you for your interest! If you have any questions or want to learn more about the USF Society of Aeronautics and Rocketry before donating, please contact us directly and/or follow us on social media using the information below:

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If you have already made up your mind and would like to donate directly to SOAR right now, you can easily do so at <http://giving.usf.edu/online>. Be sure to select fund #220111 when donating. Thank you!

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