

## **Competition Announcement: Unique NASA Opportunity to Design, Build, and Launch High-Power Rockets**

The Minnesota Space Grant Consortium (MnSGC) announces its intention to run a **Space Grant Midwest High-Power Rocket Competition**, held in the Midwest but open to college/ university student teams from across the nation, during the 2018-2019 academic year. This competition is an opportunity for students to design and construct high-power rockets to be launched in May of 2019 from a Tripoli MN launch site near Minneapolis, MN.

### **No previous experience in high-power rocketry is necessary to compete!**

Up to 30 college/university teams sponsored by their state's Space Grants will be accepted into this competition. Interested teams from any state, not just those in the Space Grant Midwest Region, are required to garner local Space Grant "sponsorship" (this might or might not involve financial support, depending on the state) then submit a non-binding "Notice of Intent to Compete" to the MnSGC by October 1, 2018, in which they list their team members, team name, and a committed faculty adviser. (Note – institutions not planning to assemble a student team until spring 2019 still should submit a Notice of Intent to Compete by Oct. 1, 2018, at least naming a faculty adviser so we know who to send updates to.) Teams are also required to consult with a non-student mentor with high-power rocketry experience, Level 2 certified (or higher). Competition organizers help teams find mentors, if need be.

A kick-off/informational telecon will be held from 7 to 8 p.m. CST on Sept. 25, 2018 (for teams planning to spend a full academic year on this project). This kick-off/informational telecon will be repeated on Jan. 17, 2019 (for teams working just during the winter/spring semester). A registration fee of \$400 per team, due by Jan. 31, 2019, will be charged to cover competition costs, including up to \$100 applied toward the purchase of two competition motors per team. States sponsoring two or three teams will be expected to provide one judge for written reports and the (in-person) competition. States fielding four or more teams may be asked to provide two judges.

***2018-2019 Competition goals:** Student teams will design and construct an "efficient supersonic" single stage, dual-deploy-required, high-power rocket that will fly twice in the competition. Rockets will fly first on a Cesaroni 491-I-218-14A "White Thunder" (1-grain, 54 mm diameter) motor – unlikely to go supersonic, but for head-to-head comparison of maximum altitude, speed, and acceleration. The second flight can be on any Cesaroni or AeroTech I-class or J-class motor and will be rated based on going supersonic but doing so as "efficiently" as possible – that is, using the lowest possible impulse motor and only going slightly faster than the speed of sound. The handbook will have a specific "figure of merit" to help define "efficient" in this context. The rocket must also carry a non-commercial data-logging sensor suite to characterize flight performance including (at least) axial acceleration, velocity, altitude, rotation about rocket axis (AKA "roll"), and ambient pressure in the av-bay. Extra points will be awarded to rockets with a camera system that can see launch, landing, plus the deployment/inflation of both parachutes and also to rockets that carry a radio telemetry system capable of sending flight performance data to the ground during the flight, to be relayed to the judges before the rocket lands.*

The competition will include two written reports about the design, analysis, simulation, build, and test flight results of the rocket, an oral presentation, plus a written assessment of competition flight data/results. These will be scored by a panel of professional engineers from both academia and industry. Scoring of the pre-competition reports and the post-flight report will focus on the system design and its performance. More details about the competition motor, reports, deadlines, etc. will be in the handbook – to be posted and discussed in the informational telecons.

**Website and competition handbook, coming no later than 9/25/18, will be posted at**

[http://www.aem.umn.edu/mnsgc/Space\\_Grant\\_Midwest\\_Rocketry\\_Competition\\_2018\\_2019/](http://www.aem.umn.edu/mnsgc/Space_Grant_Midwest_Rocketry_Competition_2018_2019/)

Logistical questions may be directed to James Flaten, MN Space Grant, U of MN, [flate001@umn.edu](mailto:flate001@umn.edu). Technical questions may be directed to Gary Stroick, Tripoli MN, [president@offwegorocketry.com](mailto:president@offwegorocketry.com).

### **IMPORTANT DATES:**

- **Kick-off/informational telecon: Sept. 25, 2018 (repeated Jan. 17, 2019) from 7 to 8 p.m. CST (contact James Flaten, MN Space Grant, for call-in information)**
- **Garner your state's Space Grant sponsorship and submit a (Non-binding) "Notice of Intent to Compete" by Oct. 1, 2018**
- **\$400 Registration Fee is due by Jan. 31, 2019, of which up to \$100 will be applied toward purchase of two competition motors – one Cesaroni I-218 and one motor of your choice**
- **In-person Competition dates: Presentations & Safety Checks on Saturday, 5/18/19 (mid-afternoon & evening) then flights on Sunday, 5/19/19 (all day, plus an evening banquet)**
- **Alternate (Weather-delay) flight date: Monday, 5/20/19 (as long as needed)**