

Space Grant 2021-2022 Midwest High-Power Rocketry Competition The “Return to Flight: Fleet Challenge” – fly-off in May 2022



Competition Announcement – College Team Opportunity to Design, Build, and Launch High-Power Rockets

The Minnesota Space Grant Consortium (MnSGC) announces its intention to run the **Space Grant (in-the-) Midwest High-Power Rocketry Competition**. The fly-off will be held in Minnesota, but this competition is open to college/university student teams from across the nation during the 2021-2022 academic year. This competition is an opportunity for students to design and construct high-power rockets to be launched in May 2022 from a Tripoli high-power rocket club launch site just north of Minneapolis.

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, 2021, in which they list their team members, certification levels, team name, and a committed faculty adviser. (Note – institutions not planning to start until spring 2022 still should also submit a Notice of Intent to Compete by Oct. 1, 2021, 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 can help teams find certified mentors, if need be.

A kick-off/informational telecon will be held from 7 to 8 p.m. CST on Monday, Sept. 20, 2021, for teams planning to spend the full academic year on this project. This kick-off/informational telecon will be repeated on Thursday, Jan. 13, 2022, for teams working just during the winter/spring term(s). A registration fee of \$400 per team†, due by Jan. 31, 2022, will be charged to cover competition costs, including up to \$100 applied toward the purchase of motors for use at the in-person competition fly-off. States sponsoring two or three teams will be expected to provide one judge for written reports and the (in-person) competition fly-off. States fielding four or more teams may be asked to provide two judges.

2021-2022: “Return to Flight: Fleet Challenge” (summary description): *In this competition, college-student teams will design and construct a set of (fairly-low-cost) high-power rockets (either five rockets (a “fleet”) or else three rockets (a “flotilla”) or else eight rockets (an “armada”). These rockets are to differ from one another in as many ways as possible, to illustrate the ability of the team to successfully demonstrate a wide variety of rocketry styles and build techniques. Every fleet (or flotilla) (or armada) must include one “core” team-built kit-rocket flown on a specific motor (see details in handbook) for “head-to-head” competition. This “core” rocket will be accompanied by four (or two) (or seven) additional rockets, some team-built and some individual-built (for certification). Every “flotilla” must include one individual-built rocket for a Level 1 certification attempt. Every “fleet” must include one individual-built rocket for a Level 1 certification attempt and one individual-built rocket by a different team member for a Level 2 certification attempt. Every “armada” must include two individual-built rockets by different team members for Level 2 certification attempts. To keep costs down, we encourage all rockets to be relatively low cost – perhaps in the \$100 to \$250 range (aside from motor, motor case and closure, and electronics). In addition to diversity or rocketry styles & building techniques, points will be awarded for “most effective use of (fleet) theme,” so rocket names, paint jobs, etc. should be coordinated. Note that all fabrication work on the rockets, except for possibly machining of plastic and/or metal parts, must be performed by students.*

The competition will include two written reports about the design, analysis, simulation, build, and test flight results of the rockets, 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-fly-off reports and the post-flight report will focus on rocket diversity, design, and performance. More details about the competition motors, reports, deadlines, etc. will be in the handbook – to be posted and discussed in the informational telecons.

A competition handbook including a more-extensive description of the challenge is posted at

http://dept.aem.umn.edu/mnsgc/Space_Grant_Midwest_Rocketry_Competition_2021_2022/

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

IMPORTANT DATES:

- **Kick-off/informational telecon: Monday, Sept. 20, 2021 (repeated Thursday, Jan. 13, 2022) from 7 to 8 p.m. CST** (contact James Flaten, flate001@umn.edu, for call-in information)
- **Garner your state's Space Grant sponsorship and submit a (Non-binding) "Notice of Intent to Compete" by Oct. 1, 2021**
- **\$400 Registration Fee[†] is due by Jan. 31, 2022, of which up to \$100 will be applied toward purchase of competition motors**
- **In-person Competition dates: Presentations & Safety Checks on Saturday, 5/21/22** (mid-afternoon & evening) then flights on Sunday, 5/22/22** (all day, plus an evening banquet)**
- **Alternate (Weather-delay) flight date: Monday, 5/23/22** (as long as needed)**

[†] Schools that entered teams in the COVID-aborted 2019-2020 Space Grant Midwest High-Power Rocketry Competition may elect to have their previous registration applied to this new competition (or else to next year's competition), but may not extend registration credit beyond 2022-2023.

** If Minnesota has a particularly wet spring, the competition dates might need to shift. This will be announced in as far in advance as is practical. See details in handbook.