September 1, 2017

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 2017-2018 academic year. This competition is an opportunity for students to design and construct high-power rockets to be launched in May of 2018 from a Tripoli MN launch site near Minneapolis, MN.

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

Up to twenty teams sponsored by their state's Space Grants will be allowed to take part in 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 2, 2017, 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 2018 still need to submit a Notice of Intent to Compete by Oct. 2, 2017, at least naming a faculty adviser.) Teams are also required to consult with a non-student, Level 2 (or higher) certified mentor with high-power rocketry experience.

Informational telecons will be held from 7 to 8 p.m. CST on both Sept. 26, 2017 (for teams planning to spend a full academic year on this project) and on Jan. 18, 2018 (for teams working on this project just for the winter/spring semester). A registration fee of $400 per team, due by Jan. 31, 2018, will be charged to cover costs, including two competition motors (up to $100 total) per rocket. States sponsoring more than one rocket team will be expected to provide one judge for written reports and the (in-person) competition.

2017-2018 Competition goals: *Student teams will design and construct a "roll-orientable" single stage high-power rocket system (dual deploy optional) that will fly twice on the same I-class or J-class motor and be recovered safely and in flyable condition. The students must implement a roll-control mechanism (without using canards) that can minimize roll (on the first flight) then follow a set of commands to roll to a series of specific orientation angles then hold each orientation for 1 second (on the second flight). Students must construct a non-commercial on-board data-logging sensor package that can log roll orientation (at least) at 10+ Hz, for comparison with orientation as documented by a downward looking video camera. Bonus challenge: Implement an XBEE-radio-based communication system so that the orientations requested can be reprogrammed at a distance and so that orientation data (and possibly other sensor data) can be sent down to a ground station by radio while the rocket is still in flight. More points for teams able to control roll and hold orientation effectively. More (bonus) points for teams able to send commands and data through their communications system quickly and reliably.*

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 9/8/17:

http://www.aem.umn.edu/mnsgc/Space_Grant_Midwest_Rocketry_Competition_2017_2018/

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:

- **Informational telecon: Sept. 26, 2017 (repeated Jan. 18, 2018) 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" due: Oct. 2, 2017**
- **$400 Registration Fee Due: Jan. 31, 2018 (pay extra if 2 motors chosen cost more than $100)**
- **Launch Competition Dates: Saturday (mid-afternoon & evening) and Sunday (all day, including an evening banquet), May 19-20, 2018**
- **Alternate (Weather-delay) Date: Monday (all day), May 21, 2018**