

2022-2023



ANNOUNCEMENT OF OPPORTUNITY

spacegrant.carthage.edu/fnl



FIRST NATIONS LAUNCH (FNL) High-Power Rocket Competition APRIL 28-30, 2023

About the Program: NASA's Wisconsin Space Grant Consortium (WSGC) is pleased to announce the 14th Annual First Nations Launch (FNL) National Rocket Competition. This competition is an opportunity for students attending a Tribal College or University (TCU), a Native American-Serving Nontribal Institution (NASNTI), or who are members of an active American Indian Science and Engineering Society (AISES) collegiate chapter to design, build, and fly a high-powered rocket to be launched at a competition at the Richard Bong State Recreational Area in Kansasville, WI.

Registration Opens:	September 1, 2022
Informational Meeting:	September 13, 2022 @ 4:00 pm CDT (Zoom)
Early Bird Non-binding Notice of Intent to Compete Due:	September 26, 2022 (Moon/Mars)
L2L Level 1 Rocket Certification Workshop Request Due:	September 26, 2022
Visit FNL Booth at the AISES Conference:	October 7, 2022
Informational Meeting:	October 18, 2022 @ 4:00 pm CDT (Zoom)
Non-binding Notice of Intent to Compete Due:	October 21, 2022 (Moon/Mars)
Early Bird Non-binding Notice of Intent to Compete Due:	October 21, 2022 (Gateway)
Launch 2 Learn Rocket Certification Workshop:	October 22-23, 2022 @ Carthage College
Selection Announcement:	October 28, 2022 (Moon/Mars/Gateway)
Kick-off Meeting:	November 1, 2022 @ 4:00 pm CDT (Zoom)
Award Acceptance Material Due:	November 14, 2022
FNL Office Hours:	December 6, 2022 @ 1:00 – 3:00 pm CDT (Zoom)
Proposal and Preliminary Budget Due:	December 12, 2022 (Moon/Mars)
Non-binding Notice of Intent to Compete Due:	December 16, 2022 (Gateway)
L2L Level 1 Rocket Certification Workshop Request Due:	December 16, 2022
Selection Announcement:	January 2, 2023 (Gateway)
Kick-off Meeting:	January 3, 2023 @ 4:00 pm CST (Zoom) Gateway
Award Acceptance Material Due:	January 16, 2023 (Gateway)
Launch 2 Learn Rocket Certification Workshop:	January 20-21, 2023 (Zoom)

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Purpose: The Wisconsin Space Grant Consortium First Nations Launch competition offers Tribal Colleges and Universities (TCU), Native American-Serving Nontribal Institution (NASNTI), as well as active American Indian Science and Engineering Society (AISES) collegiate chapters the opportunity to demonstrate engineering and design skills through direct application in high-power rocketry. The competition requires teams of undergraduate students to conceive, design, fabricate and

compete with high-power rockets. FNL is a 'First Step' experience designed for students with no prior experience working with high-powered rockets. Rocket motors and dimensions are restricted by competition parameters so that knowledge, creativity and imagination of the students are challenged. The end result is a great aerospace learning experience unique to the Native American communities.

It is the purpose of this Announcement of Opportunity to support the innovative, visionary projects that are student-led and designed to fully realize WSGC's goal of assisting in training the next generation of aerospace professionals.



Gateway Challenge

Teams shall design and construct a dual deploy high-power rocket from a list of possible kit combinations. There is no payload/challenge associated with this challenge, with the focus being on the safe and complete selection, simulation, procurement, assembly/fabrication, and flight of the kit rocket. The flight shall be stable and reach an apogee of 2500' AGL. The rocket should satisfy all other technical requirements as outlined in the competition handbook.



Moon Challenge

Teams shall design, test, and fabricate specific structural design components (nosecone/shoulders, bulkheads/centering rings, fins, avionics sled) of a lightweight rocket from raw materials - the focus is on material science, fabrication, and understanding material properties and strengths. The rocket shall be based on 1 of 3 Commercial off-the-Shelf (COTS) kits. The rocket shall be designed as such to be lighter than the COTS kit, but equally strong if not stronger. Teams will be partially scored based on overall fabricated weight versus COTS weight comparison. The flight shall be stable and reach an apogee between 3000' and 4000' AGL. The rocket should satisfy all other technical requirements as outlined in the competition handbook.



Mars Engineering Challenge

Teams shall design, test, and fabricate all structural components of a lightweight rocket from raw materials - the focus is on material science, fabrication, and understanding material properties and strengths. The rocket shall be based on 1 of 3 COTS kits. The rocket shall be designed as such to be lighter than the COTS kit, but equally strong if not stronger. Teams will be partially scored based on overall fabricated weight versus COTS weight comparison. The flight shall be stable and reach an apogee between 3500' and 4000' AGL. The rocket should satisfy all other technical requirements as outlined in the competition handbook.

Team Challenge Awards *(based on availability of funds) :*
*(** Gateway Challenge/**International Teams eligible for award)*

- Grand Prize Award:** \$3000 w/invitation and travel stipend for a VIP Tour at a NASA Center
- 2nd Place:** \$2000
- 3rd Place:** \$1000
- *** Written Reports Award:** Certificate
- **/** Oral Presentation Award:** Certificate

Competition Awards *(based on availability of funds):*

- **/** Aesthetic Award:** Awarded to the team chosen by their peers as the team whose rocket has the most innovative and professional appearance.
- **/** Team Spirit Award:** Awarded to the team chosen by their peers as the team that shows interactive spirit, helpfulness, and cooperation.
- **/** Rookie Team Award:** Awarded to a new team that completes all phases of the rocket competition with determination and perseverance.
- **/** Advisor Award:** Awarded to an advisor or co-advisor that equips, encourages, and empowers their team to compete with confidence and capabilities that lead to next step opportunities.
- **/** Team Lead Award:** Awarded to a team lead that fulfills their role with excellence.
- **/** Altitude Award:** Awarded to the team whose actual apogee is closest to the predicted apogee without going over the predicted apogee in the Flight Readiness Report.
- **/** Judges Award:** Awarded to the team chosen by the judges as the team who met the goals of the program and exemplified hard work and determination.
- **/** Nobile Award:** Awarded to the team chosen by Tripoli Rocketry Association who met all safety expectations by designing and building the competition rocket according to TRA standards and recommendations.
- Next Step Award:** Up to \$15000 Project/Team Travel Award w/invitation to Student Launch at Marshall Space Flight Center and/or RockOn! At Wallops Flight Facility.
- **/** Outreach Award:** \$500
- **/** Patch Contest Award:** \$100 *(U.S. Citizens only)*
- ** Team Advisor Stipend:** \$1000 *(\$500 for on-campus activities, \$500 for travel to the competition)*
Teams led by an advisor/co-advisor will split the stipend (\$500/\$500)
- **TRA Membership:** One-year Tripoli Rocketry Association Membership upon Level 1 Certification through First Nations Launch.

Equipment/Reimbursable funds provided by WSGC:

Competition Rocket Motor	<p>One (1) competition motor per team will be provided per the competition parameters. WSGC also provides ejection charges and a motor casing for competition flights.</p> <p>NOTE: Motor selection deadline: February 27, 2023</p>
Project/Travel Award	<p>Reimbursed up to \$4000 for project and travel expenses (U.S. teams only). Teams traveling from Mountain, Pacific, Hawaiian, or Alaskan time zones may request additional travel funds. Requests should be submitted with the budget proposal.</p> <p>WSGC provides lodging in Kenosha, WI, during the launch weekend. Each team receives up to three (3) hotel rooms per night for a maximum of three (3) nights at the hotel selected for the competition. WSGC provides the following meals: Friday breakfast and lunch, and Saturday lunch and dinner. <u>Teams are responsible for their own transportation to and from the competition locations.</u></p> <p>NOTE: Reimbursement deadlines are: March 6 and May 8, 2023</p>
Learning Resources	<p>Each team that participates in the Virtual Kick-Off Meeting will receive a low-power rocket for demonstration flight requirements.</p> <p>Each new school registered to compete will receive two reference resources: Model Rocket Design and Construction Third Edition and Modern High-Power Rocketry 2.</p> <p><i>Teams participating in the competition will be eligible to send three team members (advisor, team lead, and team member) to attend a Launch 2 Learn Level I Rocket Certification Workshop hosted by WSGC with all expenses paid. Returning teams may participate in the workshop. Universities/colleges participating in the competition for the first time will be given first consideration.</i></p>
Rocket Certification	<p>Advisors and students may obtain their Tripoli High-power Rocketry Certification through an in-person or virtual Launch 2 Learn (L2L) rocket certification workshop. Each team is eligible to send up to 3 individuals (Advisor/Co-advisor, Team Lead, and Team Member) to the workshop. Participants receive a Level 1 Rocket Kit, Motor, and Level 1 Tripoli Rocketry Association Certification upon a successful flight. WSGC provides travel funds for individuals attending the in-person workshop and/or travel funds to attend a local launch site event.</p> <p>https://spacegrant.carthage.edu/first-nations-launch/launch-2-learn-rocket-certification-workshop/</p>
Outreach Resources	<p>Each team may request a "Reach for the Stars National Rocket Competition" Kit to conduct a local outreach event for 15 students ages 10-18. Outreach participants will be eligible for the Reach for the Stars National Winners' Celebration at the U.S. Space & Rocket Center in Huntsville, Alabama.</p> <p>http://www.rocketcompetition.com/index.html</p>

First Nation Launch Project Deliverables

Deliverables required for successful participation are listed below:

1. Participation in the virtual Kick-off Meeting.
2. Provide a reusable rocket with required payload/challenge system ready for competition launch.
3. Provide a RockSim rocket simulation file of the design rocket at each design phase (Proposal, PDR, CDR, FRR, and one day prior to the competition launch).
4. An Estes rocket must be flown before PDR and a video of the flight uploaded prior to PDR. WSGC will provide the rocket. A launch pad will be provided by WSGC for new teams.
5. Written reports (PDF format) and virtual presentations (PowerPoint format) completed and submitted to the WSGC FNL grant management team by the team lead on applicable due dates.
6. Participation in PDR and CDR virtual reviews (Zoom teleconference).
7. Participation in one (1) Safety Review after CDR and one (1) Virtual Technical Inspection after FRR with Tripoli Wisconsin (Zoom teleconference).
8. Flight (avionics) data must be turned in on competition launch day, via flash drive.
9. Provide 2-3 photos featuring the team designing, building and flying the competition rocket to be submitted to the WSGC Grant Management page by the team lead by PLAR deadline.

Review the following competition requirements in the Competition Handbook:

1. Challenge
2. General
3. Vehicle
4. Recovery System
5. Safety

Application Requirements: Team/Individual applicants who meet the following requirements can apply for this program by registering and applying online at spacegrant.carthage.edu/about/login.

To qualify for the competition, individuals/teams must:

1. be enrolled at a Tribal College/University, a Native American-Serving Nontribal Institution (NASNTI), or attending a university with an active AISES program
2. have a committed faculty mentor
3. have a Tripoli or NAR mentor*
4. select a team leader

Individuals/teams:

1. should be comprised of approximately 4-6 students
2. can compete without experience (*Teams will be given the basic training and information required*)
3. shall seek advice/mentorship from Industry, Tripoli, NAR, and others

***Note from Tripoli:** *Without exception, university teams must involve an experienced mentor, preferably a TAP or L3CC, during the design and construction phases of their rocketry projects if they expect to fly the competition rocket at Tripoli events. The mentor must be certified at or above the level of motor the team wishes to fly AND be experienced in the type of construction, propulsion, and recovery the team uses.*

To Register and Apply: The faculty advisor must first register with WSGC before students/team members register. One exception to the order of registration exists. If the student team lead has never registered with WSGC, he/she must register before the advisor begins the Notice of Intent (NOI).

A **faculty advisor** must complete the following steps:

1. **REGISTER** as faculty on the WSGC website (<https://spacegrant.carthage.edu/about/login/>). Applicants will be prompted to update personal information annually.
2. Complete and submit the “Rocket Launch Team (Create NOI)” Grant **APPLICATION** form (<https://spacegrant.carthage.edu/forms/account/login/?next=/forms/application/first-nations-rocket-competition/>). The following information/documents will be submitted during this step:
 - a. Individual W9
 - b. Media Release

- c. Challenge selection: If applying for both the Moon and Mars Challenge, please indicate in the Rocket Launch Team NOI which competition is the school's preference. *(Up to twenty-four teams will be selected to compete in the First Nation's Launch. WSGC will give priority to early registrants and first-time participants).*
- d. Student team lead
- e. Co-Advisor (if applicable)
- f. Mentor

Once the faculty advisor completes the Notice of Intent (NOI), identifies the team name, lists the co-advisor (if applicable), mentor, team lead and student participants, and chooses which competition the team will compete in, the team lead and each team member will need to:

1. REGISTER as an undergraduate student on the WSGC website (<https://spacegrant.carthage.edu/about/login/>). Applicants will be prompted to update personal information annually (if previously registered).
2. Complete and submit the First Nations Rocket Competition APPLICATION form (<https://spacegrant.carthage.edu/forms/account/login/?next=/forms/application/first-nations-rocket-competition/>). The following information/documents will be submitted during this step:
 - a. Team Name submitted by the Faculty Advisor
 - b. Student Challenge (Moon, Mars or Gateway)
 - c. Media Release

Award Acceptance Components: As part of the award acceptance, participants will submit the following documents on the WSGC application website under Program Applications/Your Applications:

Advisor

- Award Agreement Letter
- W9
- Media Release

Team Lead

- Award Agreement Letter
- Proposal and Preliminary Budget
- Media Release

All Team Members

- Media Release

Please direct questions about the First Nations Launch program to:

Wisconsin Space Grant Consortium

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This funding opportunity is made available for the pursuit of space-related research and/or activities through the National Space Grant College and Fellowship Program: NASA Educational Cooperative Agreements #80NSSC20M0123. Catalog of Federal Domestic Assistance (CFDA) number for this award is 43.008. All awardees are subject to the terms of the prime award. The material contained in this document is based upon work supported by a National Aeronautics and Space Administration (NASA) grant or cooperative agreement. Any opinions, findings, conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of NASA. All awards are fully competitive awards of opportunity in which applications are reviewed by the WSGC Technical Advisory Panel and other experts as needed. Awards are made by the Assistant Director based on recommendations from the WSGC Technical Advisory Panel.

Please follow us on     for program updates

