



2018-2019  
**ANNOUNCEMENT OF OPPORTUNITY**  
[spacegrant.carthage.edu](http://spacegrant.carthage.edu)

**FIRST NATIONS LAUNCH (FNL)**  
**High-Power Rocket Competition**  
**APRIL 25-28, 2019 (TBC)**

**Informational Telecon** (Telecon #: 262.551.2124): October 23, 2018 @ 4:00 pm CDT  
**Non-binding Notice of Intent to Compete Due:** October 26, 2018  
**Selection Announcement:** November 2, 2018  
**Virtual Kick-off Meeting** (Telecon #: 262.551.2124): November 6, 2018 @ 4:00 pm CST

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

**Grand Prize Award:** \$3000 Team Travel Award w/invitation to a NASA Center  
**2nd Place:** \$2000  
**3rd Place:** \$1000  
**Aesthetic Award:** Team whose rocket has the most innovative and professional appearance.  
**Team Spirit Award:** Team chosen by their peers as the team that shows interactive spirit, helpfulness, and cooperation.  
**Altitude Award:** Team whose actual apogee is closest to the predicted apogee in the Flight Readiness Report.  
**Judges Award:** Team chosen by the judges as the team who met the goals of the program and exemplified hard work and determination.  
**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  
**Team Advisor/Mentor Stipend:** Up to \$1000 (Teams must meet the conditions of participation)

**Equipment/Reimbursable funds provided by WSGC:**

Competition Rocket Motor	Two (2) motors per team will be provided per the competition parameters. WSGC also provides ejection charges and a motor casing for competition flights. <b>NOTE: Motor selection deadline: March 1, 2019</b>
Project/Travel Award	Reimbursed up to \$3,000. 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: Thursday dinner, Friday lunch, and Saturday lunch and dinner. Teams are responsible for their own transportation to and from the competition locations. <b>NOTE: Reimbursement deadlines are: March 19 and May 03, 2019</b>
Learning Resources	Each team that participates in the Virtual Kick-Off Meeting will receive a low-power rocket for demonstration flight requirements. Each new school registered to compete will receive two reference resources: Model Rocket Design and Construction Third Edition and Modern High-Power Rocketry 2. Tribal Colleges and Universities participating in the competition for the first time will be eligible for an on-site rocket workshop (Tribal Challenge only) hosted by WSGC ( <i>based on availability of funding</i> ).

## **NASA's Wisconsin Space Grant Consortium (WSGC) is pleased to announce the 10th Annual First Nations Launch (FNL) National Rocket Competition.**

This competition is an opportunity for students attending a Tribal College or University, or who are members of a campus AISES chapter, to design, build, and fly a rocket to be launched at a competition at the Richard Bong State Recreational Area in Kansasville, WI.

**Purpose:** The First Nations Launch competition offers Tribal Colleges and Universities, in addition to AISES chapter students, the opportunity to demonstrate engineering and design skills through direct application in high-powered rocketry. The competition requires teams of undergraduate students to conceive, design, fabricate, and compete with high-powered rockets. The restrictions on rocket motors and dimensions are limited so that knowledge, creativity, and imagination of the students are challenged. The end result is a unique aerospace experience for students that provides a great aerospace experience unique to 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.*

### **Tribal Challenge**

**Rocket Design Objectives:** The objective of the WSGC 2019 First Nations Launch **Tribal Challenge** is: To construct a high-power rocket equipped with a video camera(s). Student teams must create a montage of videos and pictures during construction, prep, flight and recovery. Videos and pictures must be of high quality and most of all creative. The video compilation must not be more than 60 seconds long after editing.

**The Challenge:** Teams must use a motor ejection charge feature, including an altimeter. The target apogee is between 2400 feet and 3000 feet above ground level (AGL) using one AeroTech reloadable/disposable 38mm motor no larger than a J impulse. Teams that come closest to their predicted apogee based on their prediction stated in the final report will gain points for the flight performance portion of the competition. Each team must assemble, fly, and successfully recover a "low-power" rocket provided by WSGC. Pictures of the team at their launch site with the rocket, before and after their launch, must be posted to WSGC's Facebook page prior to submitting the preliminary design report (PDR) and budget.

### **AISES Challenge**

**Rocket Design Objectives:** The objective of the WSGC 2019 First Nations Launch **AISES Challenge** is: To design and construct a micro-controller system installed in a high-power rocket that can capture crucial data during flight.

**The Challenge:** Teams must have at least three (3) reportable captured data files. Data captured may include, but is not limited to: fin flutter, air frame vibrations, air frame temperatures, internal pressure changes, coefficient atmospheric changes during flight, internal pressure data during deployment of charges, GPS coordinates, etc. Teams retrieving logical data from the flight will gain points on the challenge performance portion. The rocket must exceed 3500 feet and no higher than 5000 feet (max) above ground level (AGL) using one 54mm Aerotech J450 DM disposable motor. Motors will be provided by WSGC. Teams that come closest to their predicted apogee based on their prediction stated on the final report will gain points for the flight performance portion of the competition. Teams must use the motor ejection charge feature, including altimeter(s) for a safe recovery.

### **All First Nation Launch Teams**

**Competition Engineering Parameters:** Student teams will be required to design and fabricate a high-power rocket withstanding high velocities. The rocket must descend under parachute creating a "Safe Flight Mission." The rocket must be fin-stabilized with a static margin of one or greater. The rocket is required to use a commercial electronic deployment recovery system (Altimeter). The electronic recovery system must deploy a parachute (or drogue chute) at apogee and the use of motor recovery deployment system as a backup will be required. Dual deployment recovery (drogue and Main) is recommended but not required. All structural components and materials must be obtained from

reputable high-power rocketry vendor or an engineering analysis demonstrating their suitability and integrity must be included with the design report. All teams are expected to retrieve their rockets in “flyable condition.”

Students must conduct all work on the rocket and payload. Faculty, mentors, and local or regional high-power rocketry safety professionals may act as consultants on safety matters and rocket design.

Team participants will be evaluated in part on the accuracy of their projected apogee target on all flights.

1. Each team must assemble, fly, and successfully recover a “low-power” rocket provided by WSGC. Pictures of the team at their launch site with the rocket, before and after their launch, must be posted to WSGC’s Facebook page prior to submitting the preliminary design report (PDR) and budget.
2. Photographs are required during the construction of your high power competition rocket, of the motor mount and fin fillet assembly to ensure proper construction techniques have been implemented.
3. All projects during the construction process must have a minimum of two (2) scheduled virtual inspections with the designated safety officer (TBA).
4. All projects must be completely constructed (or 90%) ready to fly two (2) weeks prior to launch date. 90% = Airframe, motor mount, fins, payload airframe, couplers, bulkheads, should be permanently attached as designed. **\*NOTE: Blue Tube, Sonotube airframes will not be allowed in the competition or the use of Plexiglas fins.**
5. All final competition project designs must have a documented flight/stable simulation profile (i.e. RockSim, OpenRocket, etc.).
6. All projects must have an aero-dynamic design. No odd rockets. NOTE: Odd rockets include flying pyramids, saucers, flying spools, etc.
7. Due to unpredictable cloud cover all projects must not exceed the recommended altitude stated in the competition challenge.
8. Two (2) motors, ejection charges, and a motor casing will be provided by WSGC
9. All projects must be designed to enable the motor deployment charge as a back-up recovery system at apogee.
10. Electronic altimeters are required for primary deployment events (Apogee and Main) and be neatly wired and organized.
11. The “Center of Pressure” (CP) and the “Center of Gravity” (CG) must be indicated on rocket.

**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](https://spacegrant.carthage.edu/about/login). To qualify for the competition, teams/individuals:

To qualify for the competition, individuals/teams must:

- be enrolled at a Tribal College/University or attending a university with an active AISES program
- have a committed faculty mentor
- select a team leader

Individuals/teams:

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

**To apply:**

A faculty advisor must complete the following steps:

- Register as faculty on the WSGC website (<https://spacegrant.carthage.edu/about/login/>).
- Submit the “Create Rocket Launch Team (NOI)” Grant Application Form (<https://spacegrant.carthage.edu/forms/account/login/?next=/forms/application/first-nations-rocket-competition/>).
- If applying for both the Tribal and AISES Challenge, please indicate in the Rocket Launch Team NOI which competition is the school’s preference. (*Up to twenty-four (24) teams will be selected to compete in the First Nation’s Launch. WSGC will give priority to early registrants and first-time participants.*)

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

- Register as an undergraduate student on the WSGC website (<https://spacegrant.carthage.edu/about/login/>).
- Complete the First Nations Rocket Competition application (<https://spacegrant.carthage.edu/forms/account/login/?next=/forms/application/first-nations-rocket-competition/>)
- Submit a media release form

**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

**All Team Members**

- Attend the Online Kick-off Meeting
- Conduct a Flight Demo
- Attend the Virtual Design Review Meetings conducted by FNL judges and Tripoli
- Oral Design Presentation
- Launch Competition

**Team Lead**

- Proposal and Preliminary Budget
- Preliminary Design Report
- Demo Flight
- Critical Design Report
- Motor Selection
- Official Team Roster, Team Photo, and Team Bio
- Flight Readiness Report
- Post Launch Assessment Report

Interested students with questions about the capabilities of the launch motors or seeking help in getting started are highly encouraged to contact **Frank Nobile** ([Maxq3@aol.com](mailto:Maxq3@aol.com)), FNL Technical Advisor; **Bob Justus** ([bob@mhbofni.com](mailto:bob@mhbofni.com)) of Tripoli Rocketry Association (a high-powered rocketry association); **Mark Abotossaway** ([mark.a.abotossaway@gmail.com](mailto:mark.a.abotossaway@gmail.com)), FNL Project Assistant and alumni; a rocket association near them, or a representative at a local Tripoli Prefecture (<http://www.tripoli.org/Prefectures>). Students interested in gaining information or experience by observing rocket launches are encouraged to contact the local Tripoli, or to attend one of the regular rocket launches held within the team's local area. Individuals may test for Tripoli High-Powered Rocket Certification (Levels I, II, III) during the FNL launch weekend.

**Please direct questions about the First Nations Launch program to:**

**Frank Nobile**

Wisconsin Space Grant Consortium  
Administrative and Technical Coordinator  
Tripoli Prefecture, Green Bay, WI  
Email: [Maxq3@aol.com](mailto:Maxq3@aol.com)

**Mark Abotossaway**

Wisconsin Space Grant Consortium  
FNL Project Assistant  
Email: [mark.a.abotossaway@gmail.com](mailto:mark.a.abotossaway@gmail.com)

**Connie Engberg**

Wisconsin Space Grant Consortium  
FNL Liaison  
Email: [cengberg@carthage.edu](mailto:cengberg@carthage.edu)

**Wisconsin Space Grant Consortium**

Carthage College  
2001 Alford Park Drive, Kenosha, WI 53140  
Phone: 262-551-6054  
Email: [spacegrant@carthage.edu](mailto:spacegrant@carthage.edu)

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 Training Grant #NNX13E43A. Catalog of Federal Domestic Assistance (CFDA) number for this award is 43.008.

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.