



# North Dakota Space Grant Consortium

Virtual Affiliates  
Business Meeting



May 8, 2020

Welcome! While we wait for all our guests:

1. Visit the poll located in this Zoom window
2. Let's see where we are "zooming in" from!

Plans have changed... thanks for your flexibility!



Thank you Mandy Guinn and everyone at United Tribes Technical College for originally setting up our conference!

This presentation and discussion will satisfy our [business meeting](#) requirements and propel us into the future.

A future [virtual student symposium](#) will take place later this year.

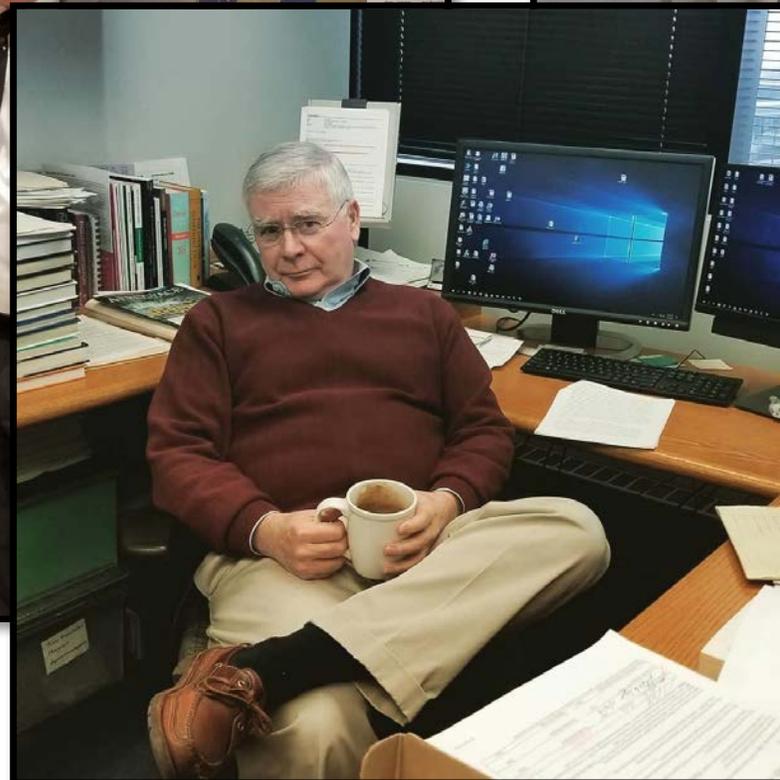


Thank you to Dr. Jim Casler for his leadership over the past few years as director!

2019 DC Meeting



2017 National Meeting



new director, Caitlin Nolby!

to everyone who participated in the ASA to make this happen.





**BISMARCK**  
STATE COLLEGE



**CANKDESKA CIKANA**  
**COMMUNITY COLLEGE**

*Spirit Lake Dakota Nation*



**DAKOTA COLLEGE**  
AT BOTTINEAU



**DICKINSON**  
STATE UNIVERSITY



**Minot State**  
UNIVERSITY



North Dakota State College of Science



*North Dakota State University*



Technical College



**UNIVERSITY OF**  
**NORTH DAKOTA**



**VALLEY CITY**  
STATE UNIVERSITY

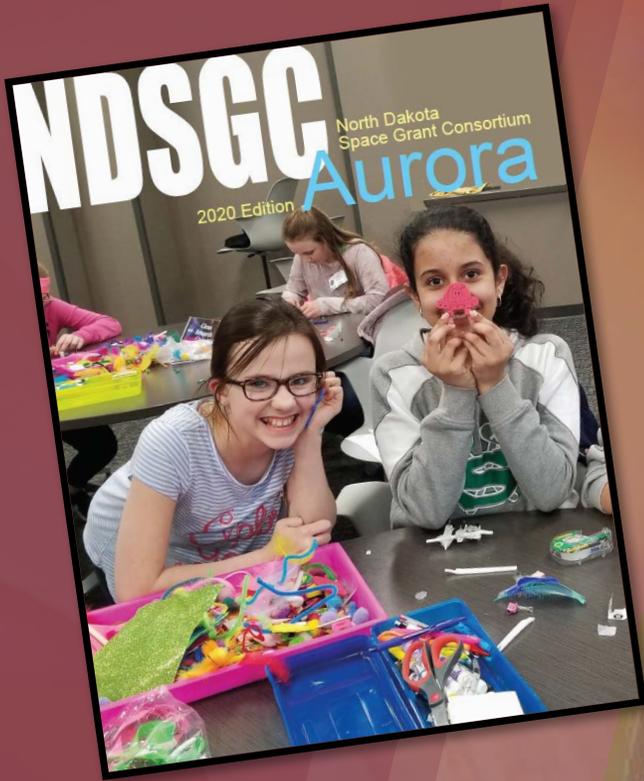


**WILLISTON**  
STATE COLLEGE



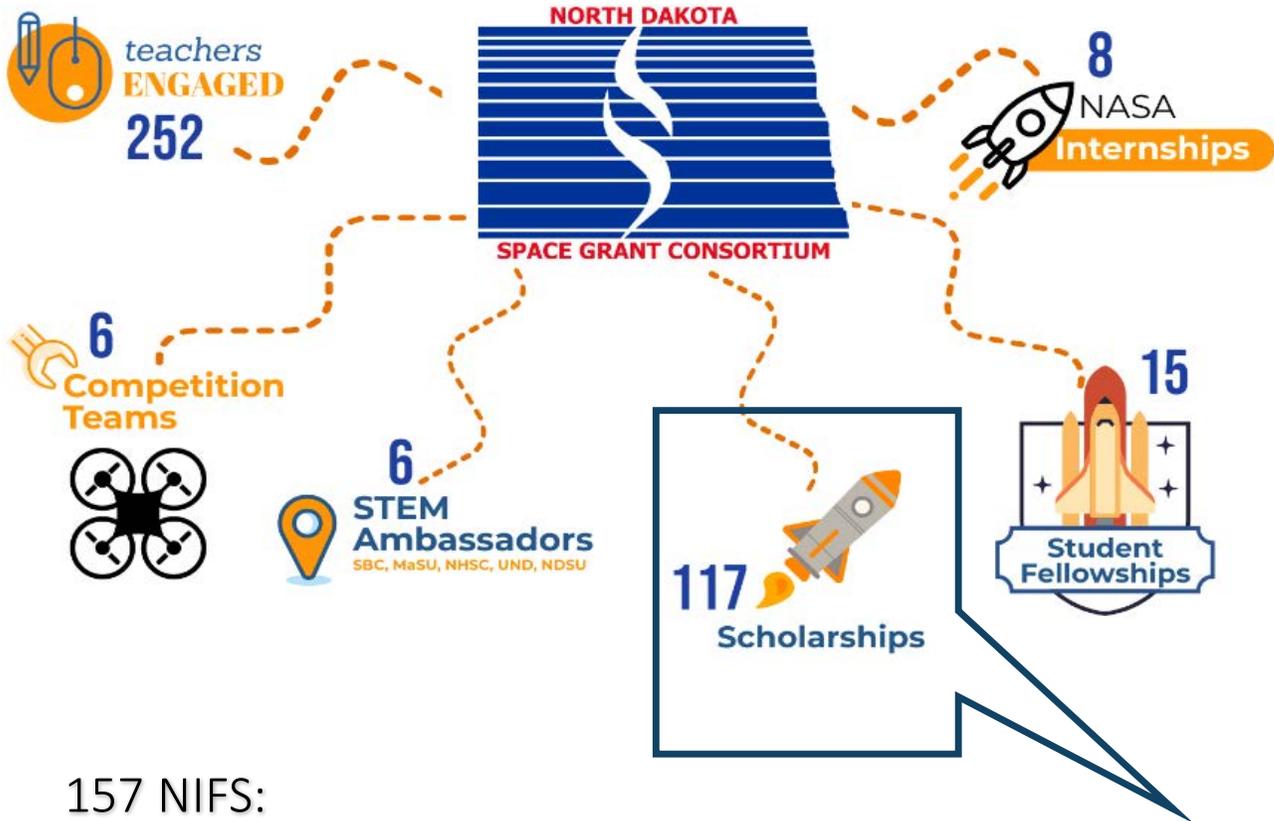
**STATE**  
**HISTORICAL**  
**SOCIETY**  
OF NORTH DAKOTA



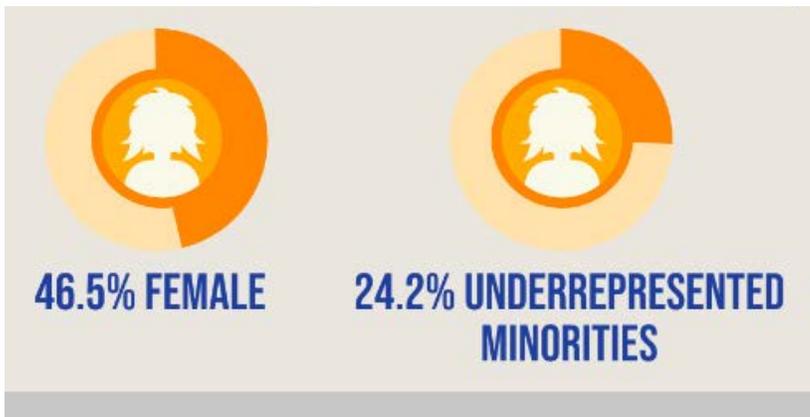


Our Aurora newsletter  
can be found online

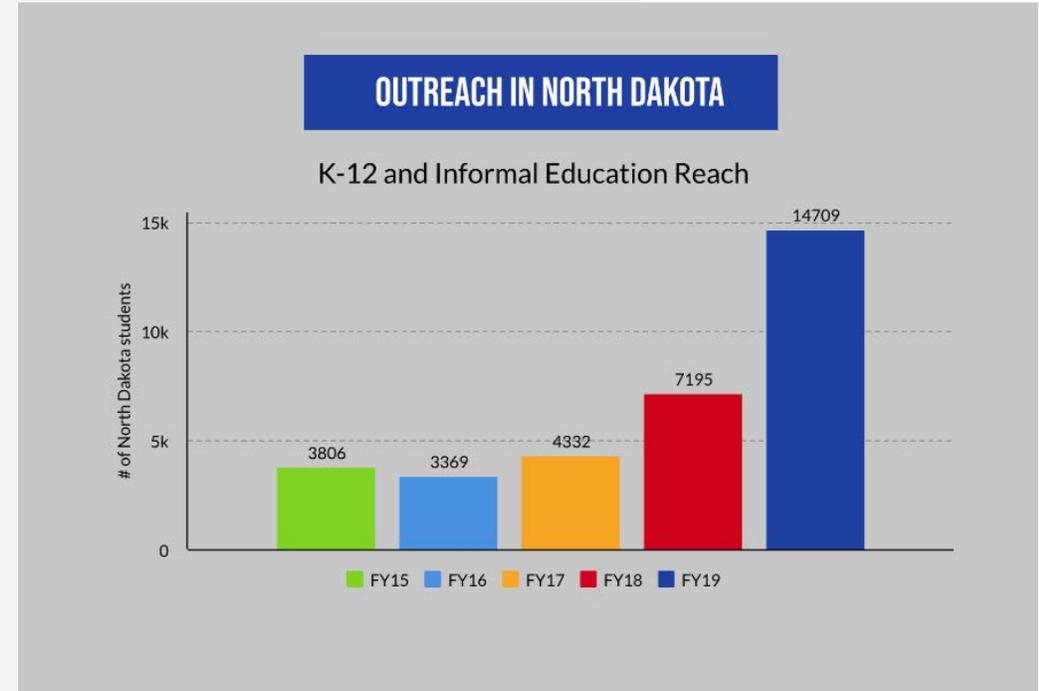
<https://ndspacegrant.und.edu/aurora>



157 NIFS:



49% to female students  
32% to underrepresented minorities



# 2019 Highlights



157 student awards

2018  
Fall Semester

# 5 Research Fellowship Recipients

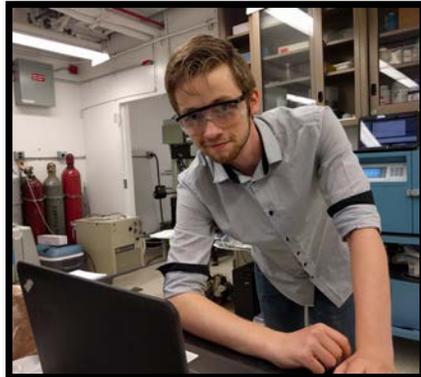


**Denise Buckner**

*Fall 2018 Recipient*

Space Studies, University of North Dakota

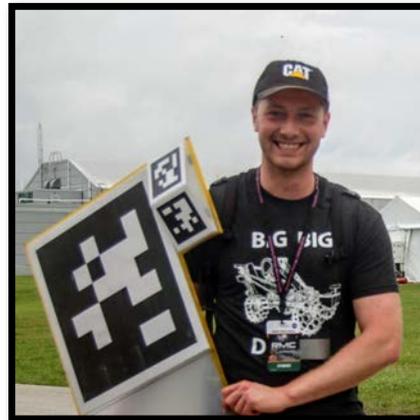
***Atmospheric and Experimental Student Initiated Research***



**Elias Holte**

*Fall 2018 Recipient*

Space Studies, University of North Dakota  
***Investigating Deliquescence and Vapor Diffusion in Halite Evaporites***



**Jacob Huesman**

*Fall 2018 Recipient*

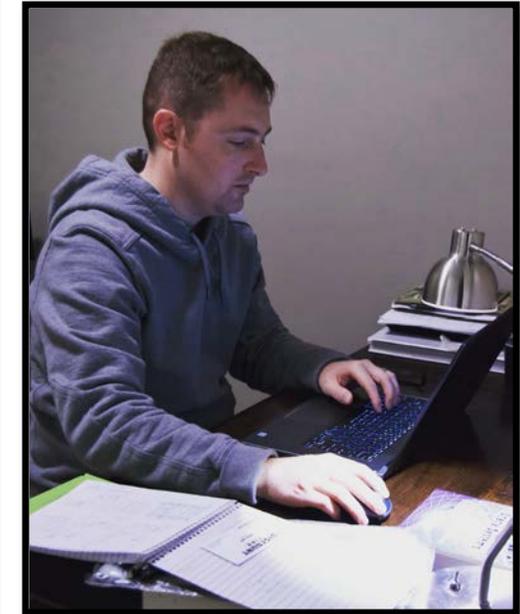
Electrical Engineering, North Dakota State University  
***Bézier Spline Based Path Planning***



**Matthew Lein**

*Fall 2018 Recipient*

Software Engineering, Valley City State University  
***SQL Server Implementation for Radon Detectors and Inventory Management for the Deep Underground Neutrino Experiment***



**Jeremy Harris**

*Fall 2018 Recipient*

Space Studies, University of North Dakota  
***Initial Research for Analysis of Ammonia-Water Thermodynamic Power Cycle on the Lunar Surface***

2019  
Spring Semester

## 5 Research Fellowship Recipients



**Nick Thomas**

*Spring 2019 Recipient*

Mechanical Engineering, North Dakota State University

***Unsteady Wake/Blade Interaction Simulations***



**Halley Score**

*Spring 2019 Recipient*

Mechanical Engineering, North Dakota State University  
***Rocket Combustion Chamber Design and Structural Analysis***



**Jason Schirck**

*Spring 2019 Recipient*

Mechanical Engineering, North Dakota State University  
***Optical Nozzle Design and Diagnostics for Supersonic Flow Studies***

## 5 Research Fellowship Recipients



**Brian Teske**

*Spring 2019 Recipient*

Aerospace Sciences, University of North Dakota  
***Can Safety Management System Attributes  
be Determined? Developing a Survey  
Instrument***



**Aaron Knudtson**

*Spring 2019 Recipient*

Mechanical Engineering, North Dakota State University  
***Turbulence Modeling of Flow Over a Rotating  
Cylinder***

# STEM Ambassador Program

6 Students (2018-2019)



Lexi Borah,  
SBC



Althea Fox,  
SBC



Janna Steen,  
NHSC



Connie Nelson,  
MaSU



Emma  
Twedt,  
NDSU



Shae Skager,  
UND

# 4 FIRST Robotics Teams



Cando, #877



Hatton-Northwood, #876



## 4 FIRST Robotics Team Competitions

### Jamestown, #7578



### West Fargo, #4818

Summer 2019  
Space Center Houston's **Visual Impairment Program** (Houston, TX)



2 ND students (and 2 chaperones)  
from the NDVS/SB

# 2018 – 2019 Academic Year College Team Final Events – NDSU teams



NDSU Rocketry



NDSU NASA Rover Challenge

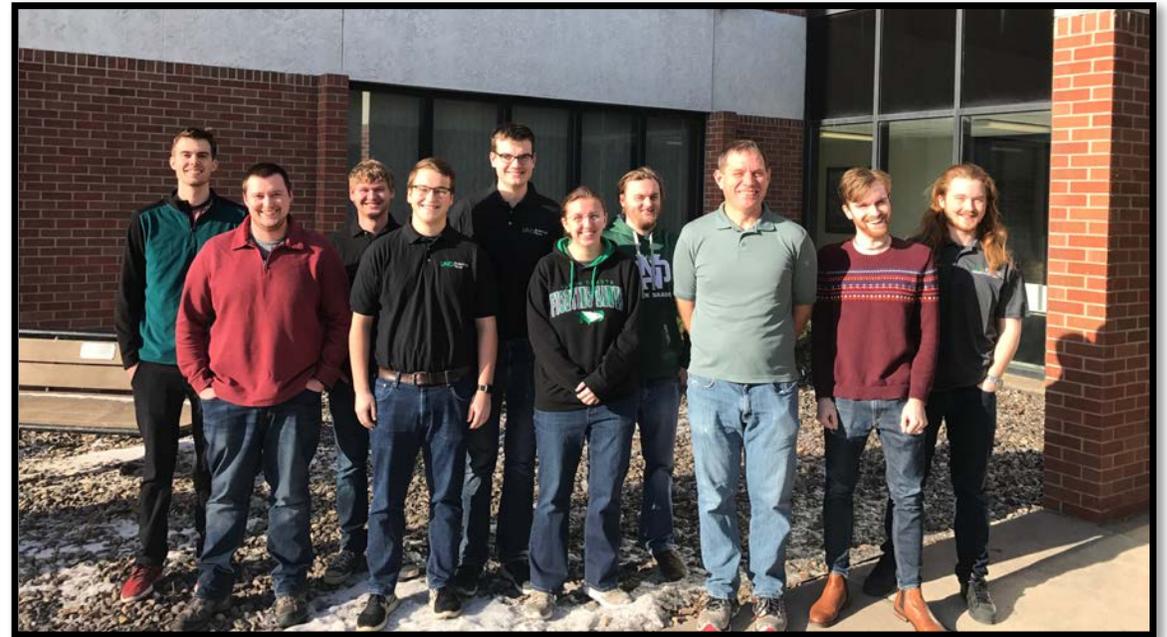


NDSU Robotics Mining

2018 – 2019 Academic Year  
College Team Final Events – UND teams



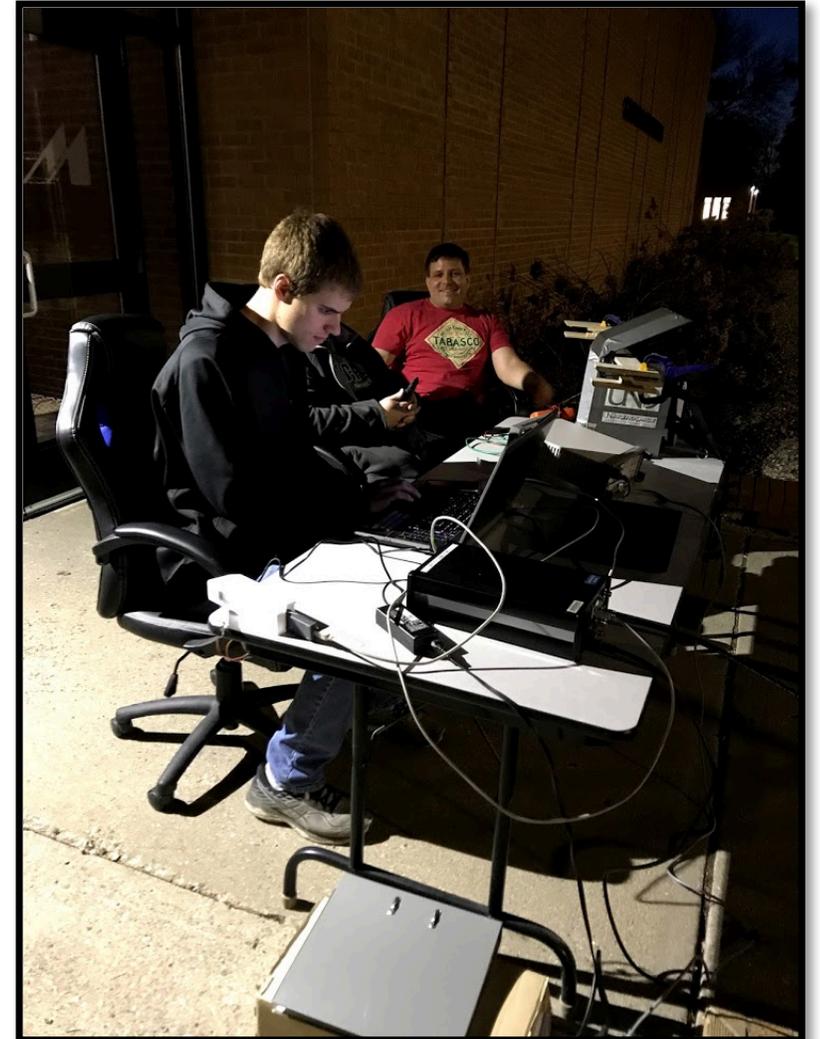
UND FSAE Team



UND Robotics Mining

# Wrapped up the Undergraduate Student Instrument Project (USIP)

- Awarded by NASA OSTEM
- UND team comprised of students from Space Studies, Atmospheric Sciences, Electrical Engineering, and Mechanical Engineering departments.
- The last night launch conducted at Mayville State University (thanks Jeff Hovde!)



# SciGirls in Space!



**Challenger Learning Center**  
Town of Ramapo, New York



**International Space Station**

The main graphic features a dark blue background with a starry space pattern. It contains two inset photographs. The top-left inset shows a woman with blonde hair wearing a black t-shirt with the "SciGirls" logo, speaking at a podium. The top-right inset shows a woman in a maroon shirt standing inside the International Space Station, surrounded by equipment and cables. Below the top-right inset, the text "International Space Station" is written in white on a black background.

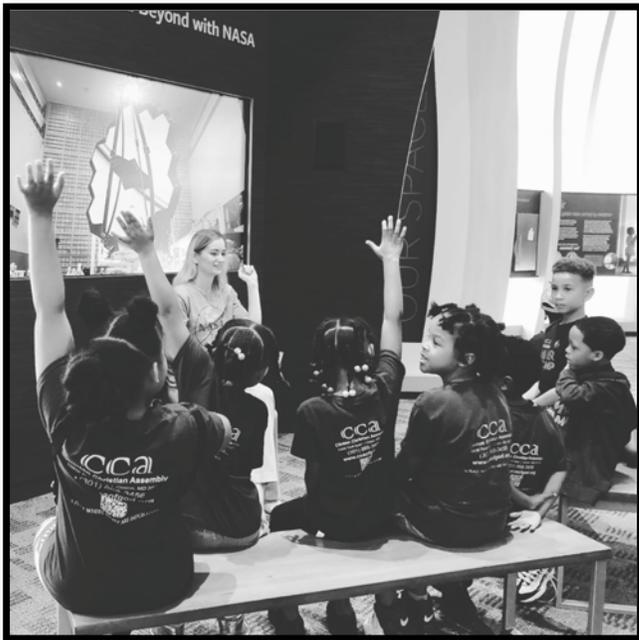
<https://www.youtube.com/watch?v=JJ6pKDrAp0g>

2019  
Summer Semester

# 8 NASA Internship Recipients

## Ashley Balzer

Space Studies, University of North Dakota  
*Goddard Space Flight Center*  
*Astrophysics Communication*



## Justin Germann

Space Studies, University of North Dakota  
*Kennedy Space Center*  
*Optimization of a Machine Learning Model for Identifying Blowing Snow Storms in Antarctica*



## Peter Henson

Space Studies, University of North Dakota  
*Kennedy Space Center*  
*Mars ISRU Pathfinder - CO2 Freezer*  
*Preliminary Scale-up Testing Analysis*



## Jace Paryzek

Mechanical Engineering, Business Administration Minor, North Dakota State University  
*Ames Research Center*  
*Raptor Wind Tunnel Blast Shield Analysis and Recommended Test Section Characterization*



## 8 NASA Internship Recipients



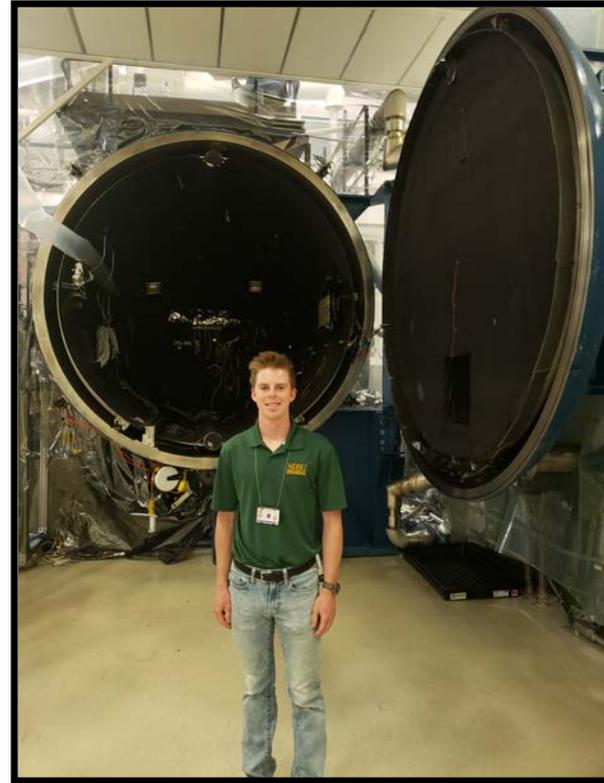
**Jared Peick**

Space Studies, University of North Dakota  
*Kennedy Space Center*  
*Development of a Recirculating, Small-Scale Invertebrate Aquaculture System for Long Duration Spaceflight*



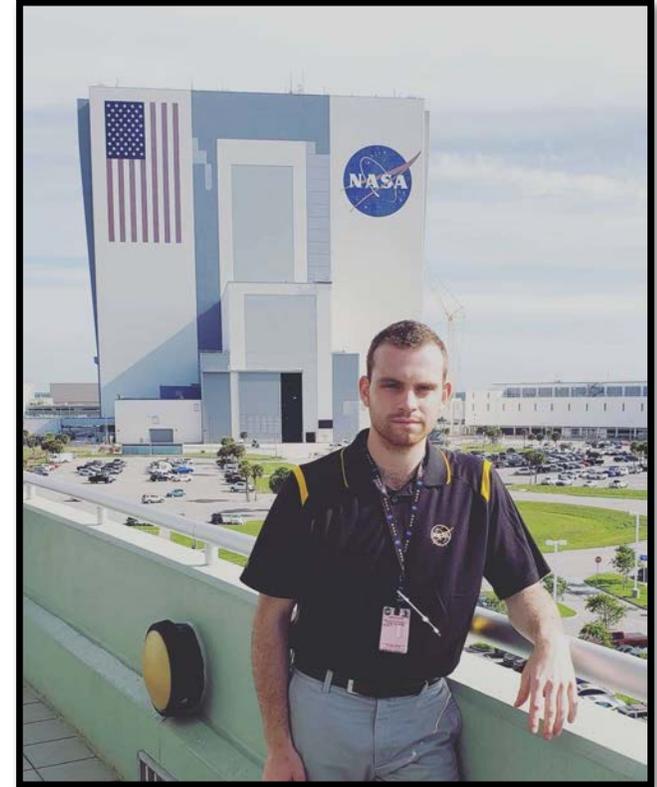
**Steven Russell**

Space Studies, University of North Dakota  
*Kennedy Space Center*  
*Culturing Biological Organisms in Simulated Microgravity*



**Nick Thomas**

Mechanical Engineering, North Dakota State University  
*Goddard Space Flight Center*  
*Kodiak Assembly and Test Support*



**Stefan Tomović**

Space Studies, University of North Dakota  
*Kennedy Space Center*  
*Radiation Monitoring Passive Surface Acoustic Wave Sensors (RaMSAWs)*

# 5 Research Fellowship Recipients



**Jason Hicks**  
*Summer 2019 Recipient*  
Computer Science, University of North Dakota  
***Automation and Visualization of Program Correctness for Automatically Generating Code***



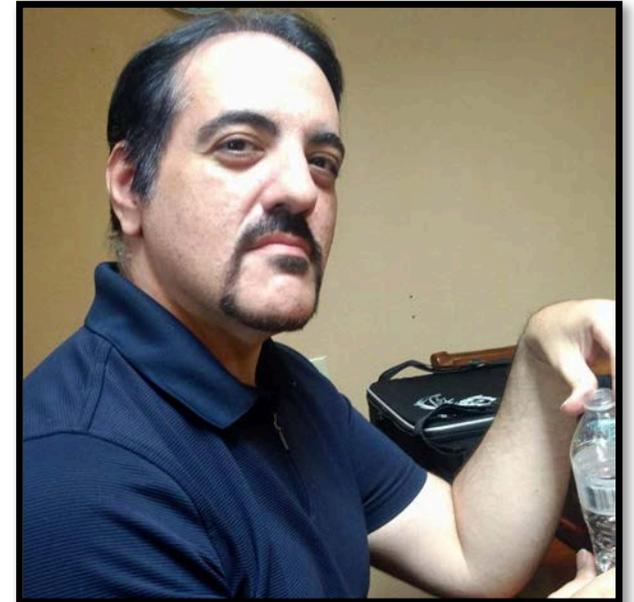
**John Spaight**  
*Summer 2019 Recipient*  
Physics and Mathematics, North Dakota State University  
***Modeling Hydration-Mediated Ion-Ion Interactions in Oscillating Yukawa Potentials***



**Paul Kvamme**  
*Summer 2019 Recipient*  
Air Traffic Management, University of North Dakota  
***Exploring Immersive Technologies for Dome Theater Learning***



**Andrew Jones**  
*Summer 2019 Recipient*  
Software Engineering, North Dakota State University  
***Decision-Making for Self-Replicating 3D Printed Robot Systems***



**Eric Ramesh**  
*Summer 2019 Recipient*  
Space Studies, University of North Dakota  
***Asteroid Farming: Investigating the Suitability of Asteroid CI Chondrite Soil for Plant Growth***

## 4 Summer Faculty Fellowship Recipients



**Eric Brevik**

Natural Sciences | Dickinson State University  
*GEOL 100L - Earth Science Laboratory*



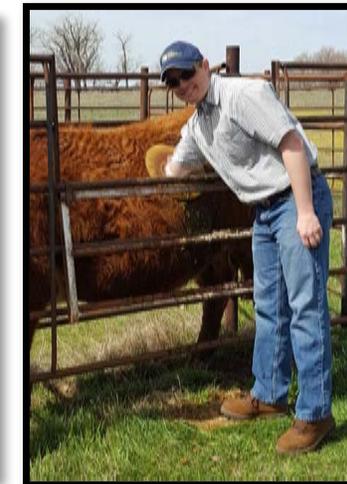
**Mandy Guinn**

Environmental Science | United Tribes Technical College  
*ATS 101 - Introduction to Atmospheric Science and Lab*



**Fardad Azarmi**

Mechanical Engineering |  
North Dakota State  
University  
*Materials Selection in  
Design*



**Joshua Steffan**

Natural Sciences and Agriculture  
and Technical Studies | Dickinson  
State University  
*BIOL/SOIL 455 - Soil  
Microbiology*

# North Dakota Vision Services/School for the Blind (Grand Forks)



# North Dakota Vision Services/School for the Blind (Grand Forks)

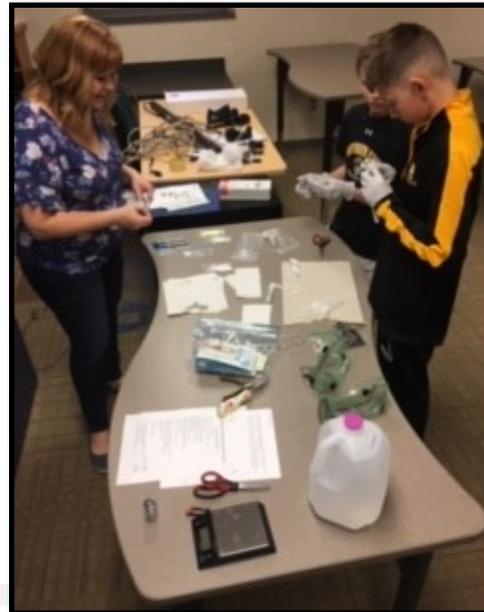
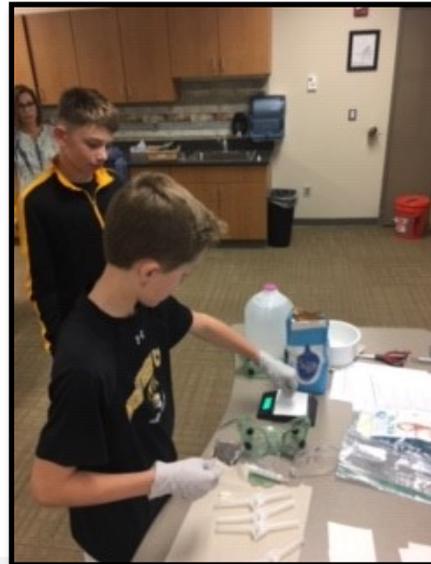
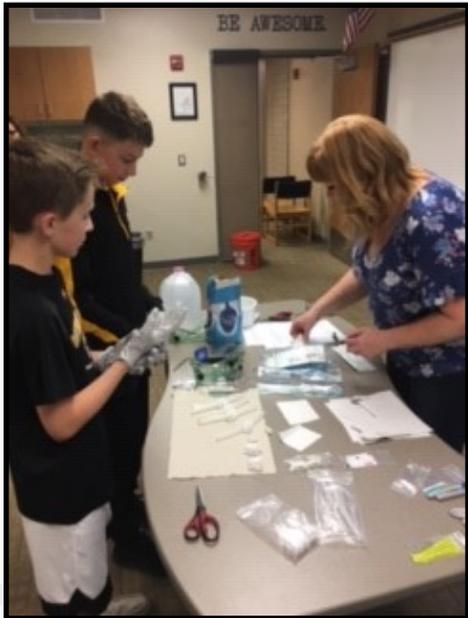
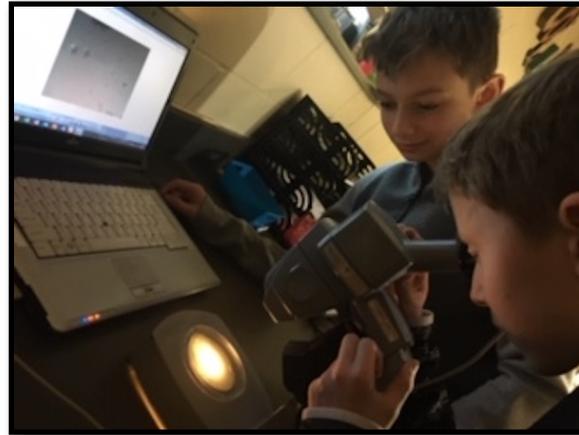


# Student Spaceflight Experiments Program (SSEP)

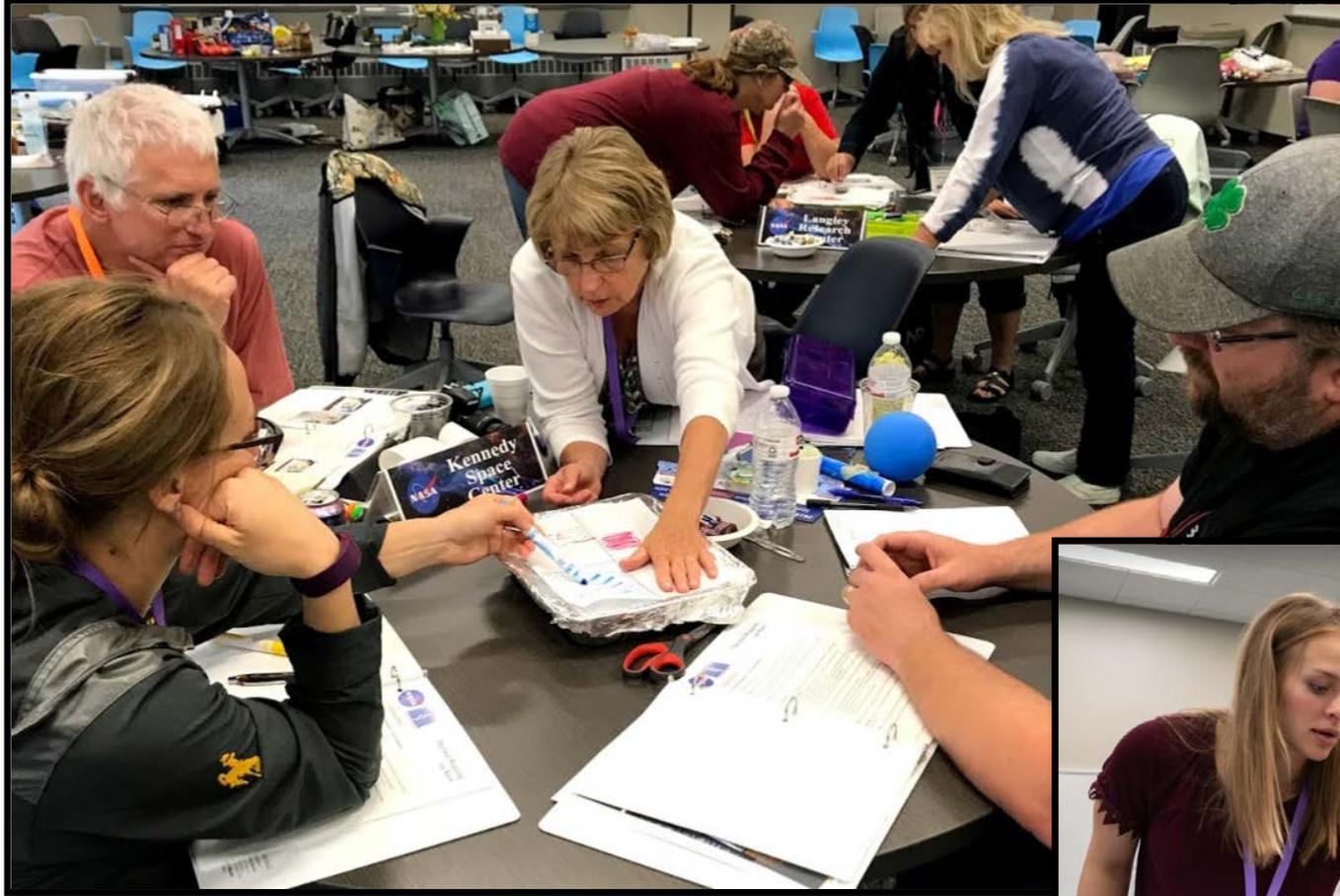
Northern Cass School with Laurie Salander

CRS-18, SpaceX

July 25, 2019



# In-service Educator Workshop at UND



1 Professional Development Credit

Hands-on STEM lessons, sharing best practices, networking, and lunar rocks/meteorite exploration!

2019  
Fall Semester

# STEM Ambassador Program

8 Students (2019-2020)

Muriel Friday, UTTC  
Kimberlee Blevins, UTTC  
Alexis Gullet, DCB  
Alexis Hesse, UND  
Kaelyn Knox, UND  
Erin Doyle, UND  
Shae Skager, UND  
Danielle Siverhus-Dinger, VCSU



2020  
Spring Semester

# STEM Ambassador Program

2020 National Space Grant Meeting in Washington DC

- 30<sup>th</sup> Anniversary Celebration at Rayburn Hall
- Shared VR and SA experiences
- Muriel (UTTC) and Kaelyn (UND)



Kaelyn with the NASA Administrator





# 3<sup>rd</sup> UND Aerospace Community Day

*(+3000 visitors!)*



STEM Ambassadors!

UND Competition Teams!

NDSGC team on steering committee

# Pearl I. Young (UND) and Lillian Goettler (NDSU) Scholarships



**Hannah Park**  
UND Air Traffic Management  
& Airport Management  
Class of 2022



**Michaela Neal**  
UND Civil Engineering  
Class of 2023



**Anna Bahnson**  
NDSU STEM Education  
PhD student

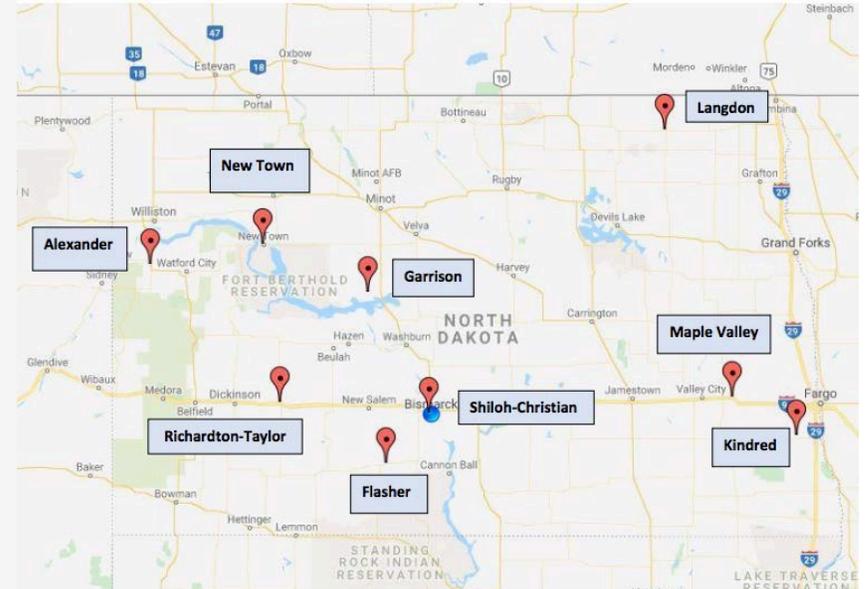


**Gina Blazanin**  
NDSU Civil Engineering  
senior

## Year-round events



NSBC 2019



# Near-Space Balloon Challenge (NSBC)



9<sup>th</sup> annual program

September 2019 – February 2020



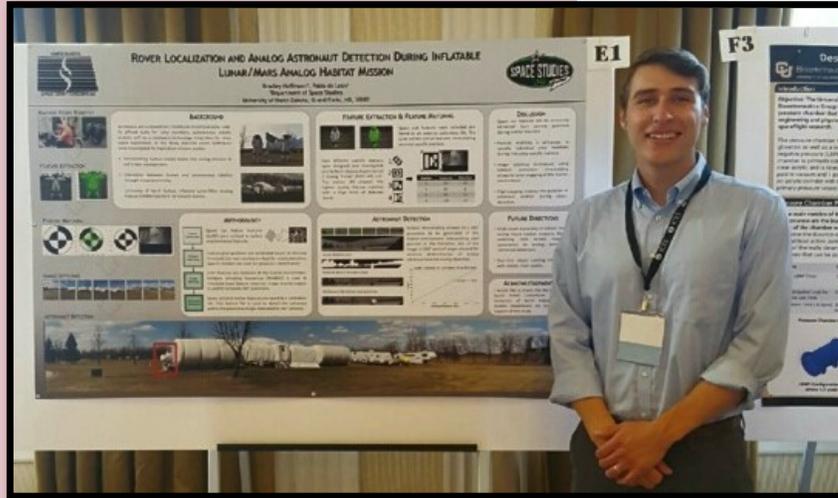


I-29

UND Aerosp



# 6 Travel Grant Recipients



**Brad Hoffman**  
Space Studies, University of North Dakota  
*Rover Localization and Analog Astronaut  
Detection During Inflatable Lunar/Mars  
Analog Habitat Mission*  
International Conference on Environmental  
Systems | Boston, MA

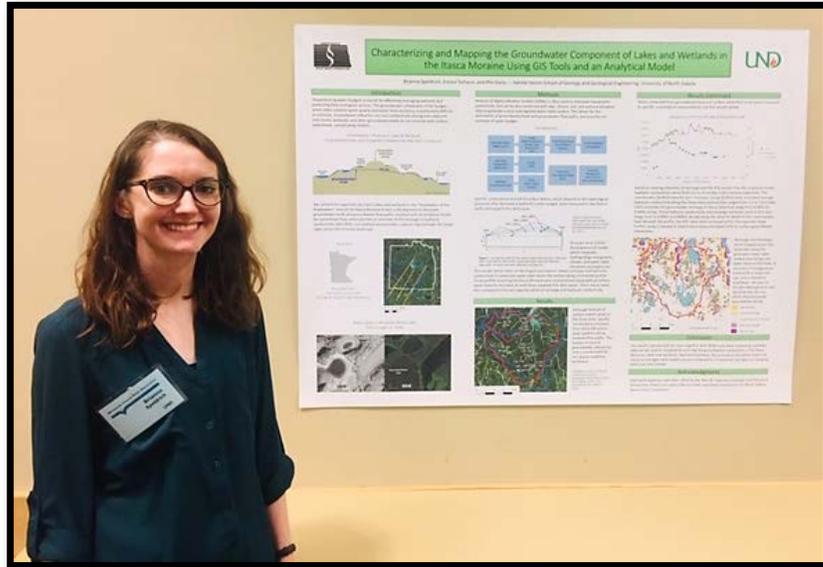


**Kathryn Hall**  
Chemical Engineering, University of North Dakota  
*On the Design of Novel Lignin-Based Green Materials*  
Materials Science and Technology Conference |  
Columbus, Ohio



**Alexis Archambault**  
Geological Engineering, University of North Dakota  
*Wetland Dynamics in a Terminal Lake Basin Using  
Remotely Sensed Imagery: Implication to Recent Hydro-  
climatic Evolution*  
American Geophysical Union Meeting | Washington, D.C.

## 6 Travel Grant Recipients



### **Brianna Speldrich**

**Geological Engineering, University of North Dakota**  
*Characterizing and Mapping the Groundwater Component of Lakes and Wetlands in the Itasca Moraine using GIS Tools and an Analytical Model*  
Minnesota Groundwater Association Spring Conference  
| St. Paul, MN



### **Joseph Allen**

**Biomedical Engineering, University of North Dakota**  
*Digital Image Processing and Metabolic Parameter Linearity to Non-Invasively Detect Analyte Concentration*  
International Astronautical Congress | Washington, D.C.



### **Manna Khan**

**Geography, University of North Dakota**  
*North Dakota Spring Wheat Yield in Relation to Temperature and Precipitation*  
American Association of Geographers Meeting | Washington, D.C.

# Pre-service Teacher Education

- Minot State University
- University of North Dakota
- Valley City State University



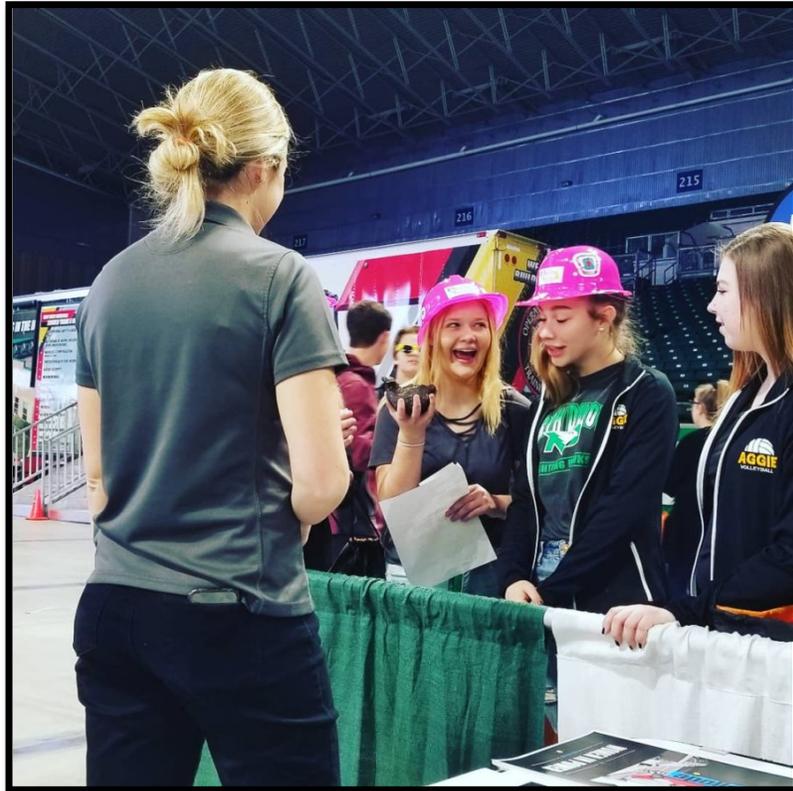
# Open-House at UND

- Pilot “open house” events in Fall 2019 and Spring 2020

Both were a great success!



# K-12 Career Fairs



## New technology:

### Oculus Go Virtual Reality Headsets

- Informal education
- K-12 events
- SciGirls ISS call
- College events
- Career Fairs
- UND Tours
- Etc.

### VR sets located at:

UND  
NHSC  
DSB



Updates from  
NASA's Office of STEM Engagement

Washington, DC Meeting  
Montana Regional Meeting  
Webinars and emails

# National Space Grant Updates

<http://stem.nasa.gov>

The screenshot shows the NASA STEM Engagement website. At the top left is the NASA logo. A navigation bar contains links for Topics, Missions, Galleries, NASA TV, Follow NASA, Downloads, About, and NASA Audiences. A search bar is on the right. Below the navigation is a large banner with the text "NASA STEM Engagement" and a logo with the tagline "INSPIRE - ENGAGE - EDUCATE - EMPLOY The Next Generation of Explorers". Below the banner is a filter bar with "Browse Topics For: Students" and "Educators" dropdown menus, and a search bar with the text "Activities and Opportunities Selected by NASA STEM Experts". The main content area features a large image of two scientists in a lab with the headline "NASA Partners with Langston University to Study Effects of Microgravity". At the bottom left is the text "Explore NASA STEM" and at the bottom right are social media icons for Facebook, Twitter, YouTube, and Pinterest.

- **STEM Search Engine**
- Filter and sort content based on **audience, opportunities, date/location, grade, subject, resource, type**
- Content has been expanded to include **topics for students**

## NASA OSTEM Videos



How we are going to Mars  
Space is Hard  
We go... as Artemis  
NASA 2020... are you ready?

# Jessica Meir, NASA Astronaut, RI Space Grant Alumna

<https://youtu.be/RYRGSXe6LJo>



Astronaut Jessica Meir @astro\_jessica

International Space Station | Expedition 61/62

Welcome to the 2020 – 2024  
Space Grant Award Period!

# Welcome to the 2020-2024 grant cycle!

- North Dakota has been awarded **\$760,000/yr**
  - Four year grant period (4/23/20 – 4/22/2024)
  - All consortia, including ND, are now at an equal funding amount
    - Elimination of two-tier system
  - In Feb, we discussed this with Rep. Armstrong, Sen. Cramer, and Sen. Hoeven.
    - All very supportive of Space Grant
- FY20: April 23, 2020 - April 22, 2021
  - New: All budget items align with NASA's mission directorates
  - New programming additions
  - Goals of staff changes
    - (Caitlin is Director, Marissa will apply for Dep. Director, call for Coordinator position TBD)



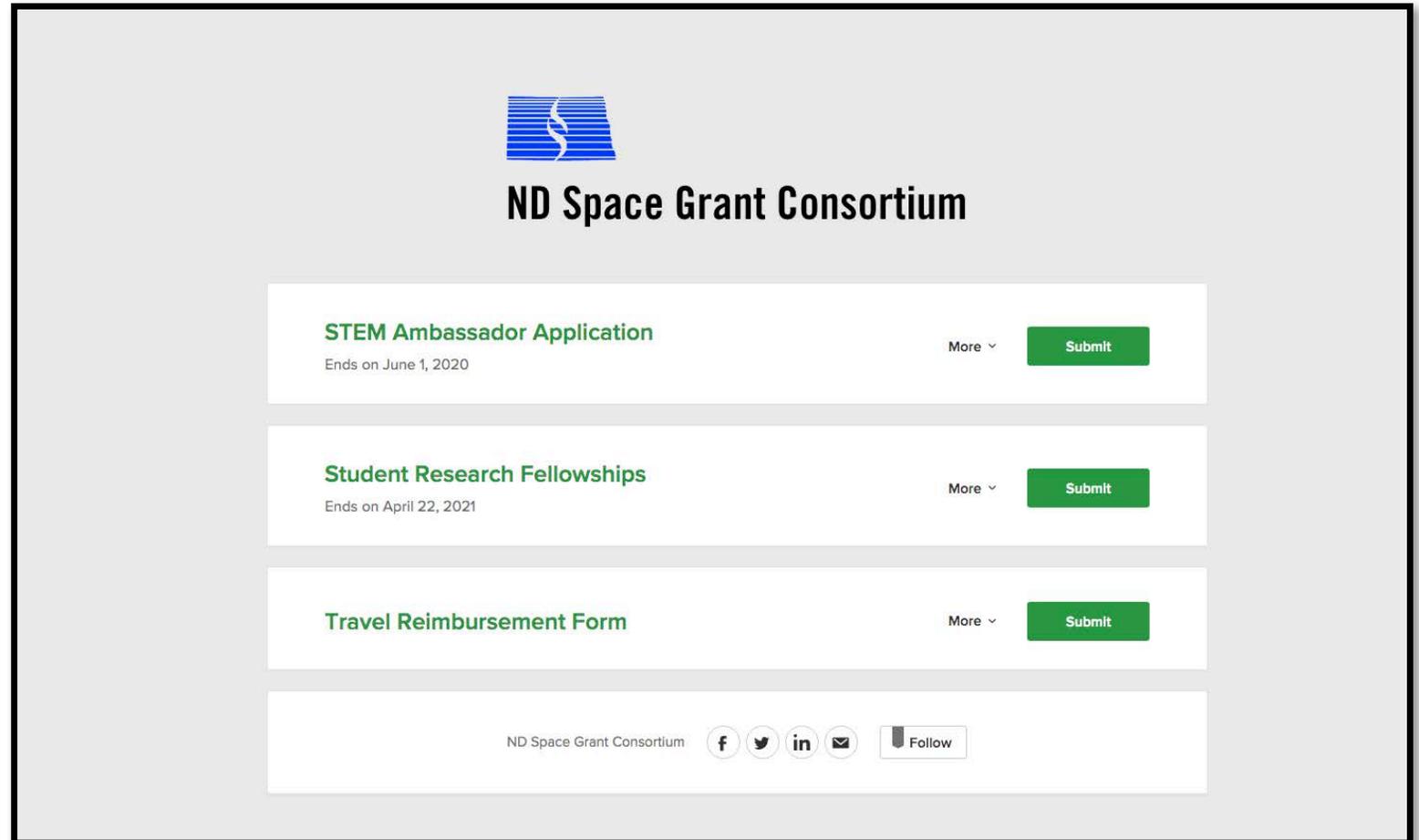
# Submittable

New submission management software

To find live forms:

1. Each application page has a **direct link** to its corresponding application form
2. [ndspacegrant.submittable.com/submit](https://ndspacegrant.submittable.com/submit)
3. [tinyurl.com/Ndsubmittable](https://tinyurl.com/Ndsubmittable)

Enables easy uploads, reviews, and reimbursements.

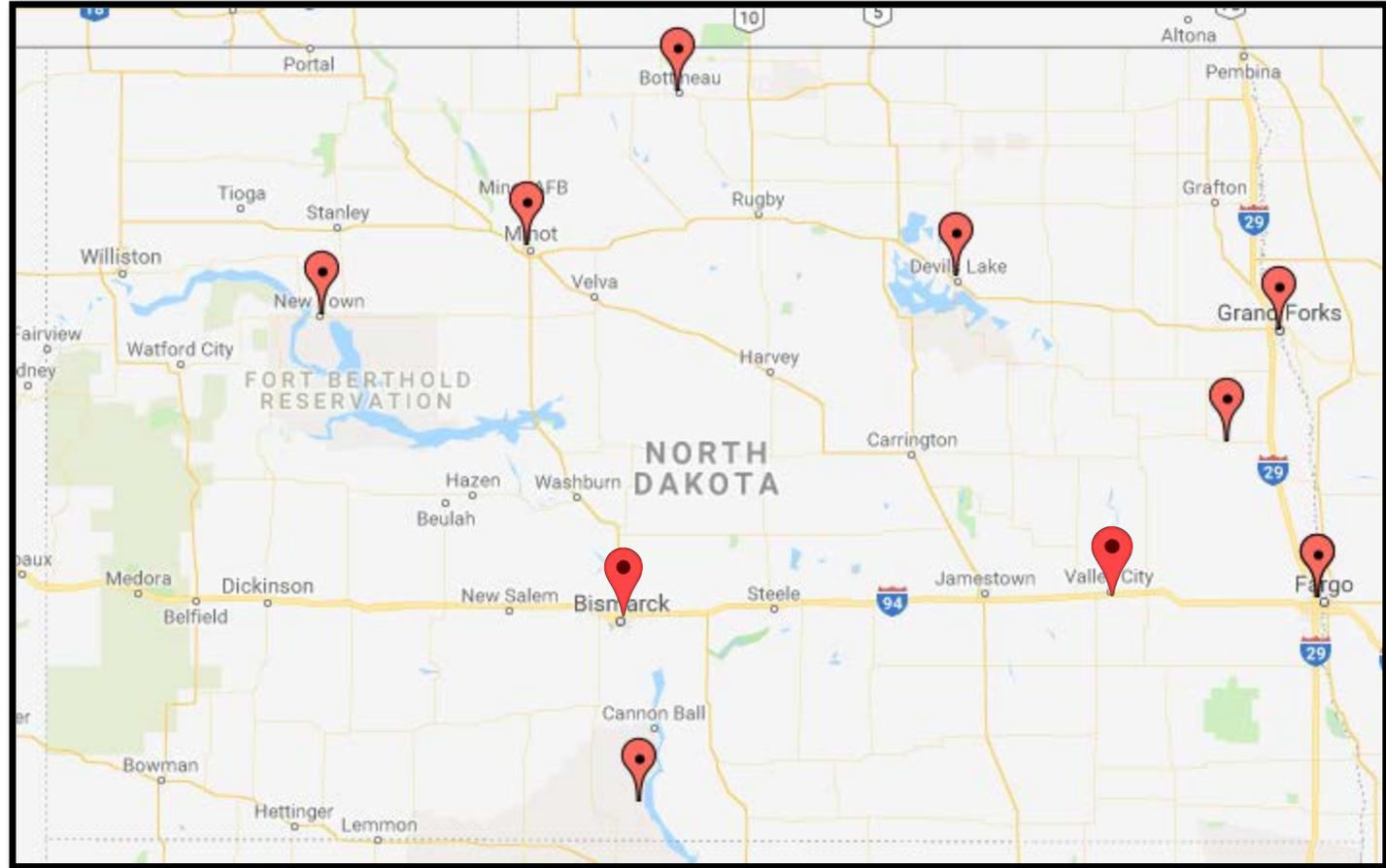


The screenshot displays the ND Space Grant Consortium's Submittable interface. At the top center is the logo, which consists of a blue square with a white stylized 'S' shape. Below the logo is the text "ND Space Grant Consortium". The main content area features three application cards, each with a title, a deadline, a "More" dropdown menu, and a green "Submit" button. The first card is for the "STEM Ambassador Application" with a deadline of "Ends on June 1, 2020". The second card is for "Student Research Fellowships" with a deadline of "Ends on April 22, 2021". The third card is for the "Travel Reimbursement Form". At the bottom of the interface, there is a footer with the text "ND Space Grant Consortium" and social media icons for Facebook, Twitter, LinkedIn, and Email, along with a "Follow" button.



# STEM Ambassadors

- Students are funded to conduct engaging outreach – *all in-person events paused*
  - K-12 schools, library events, museums, public outreach events
  - One Ambassador worked full time at Gateway to Science Center – ½ stipend from NDSGC, ½ GSC
- **STEM Education majors encouraged!**
  - We're visiting more education classes
  - We can visit your school!
- Summer 2020: 4 new UND applicants (conducting online work, social media)
- Fall/Spring semester: apps due **June 1<sup>st</sup>**



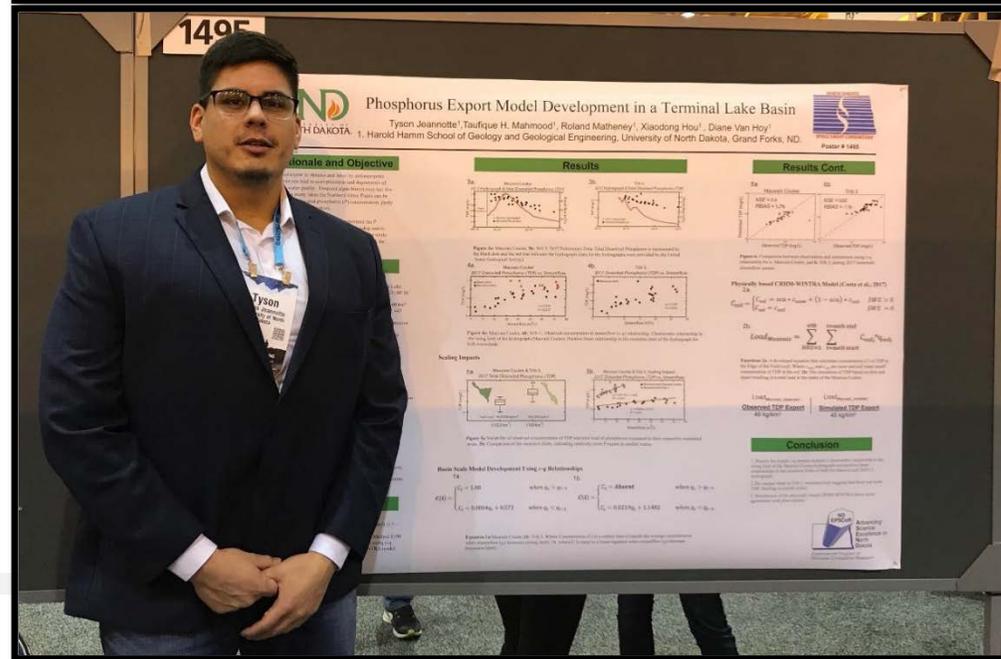
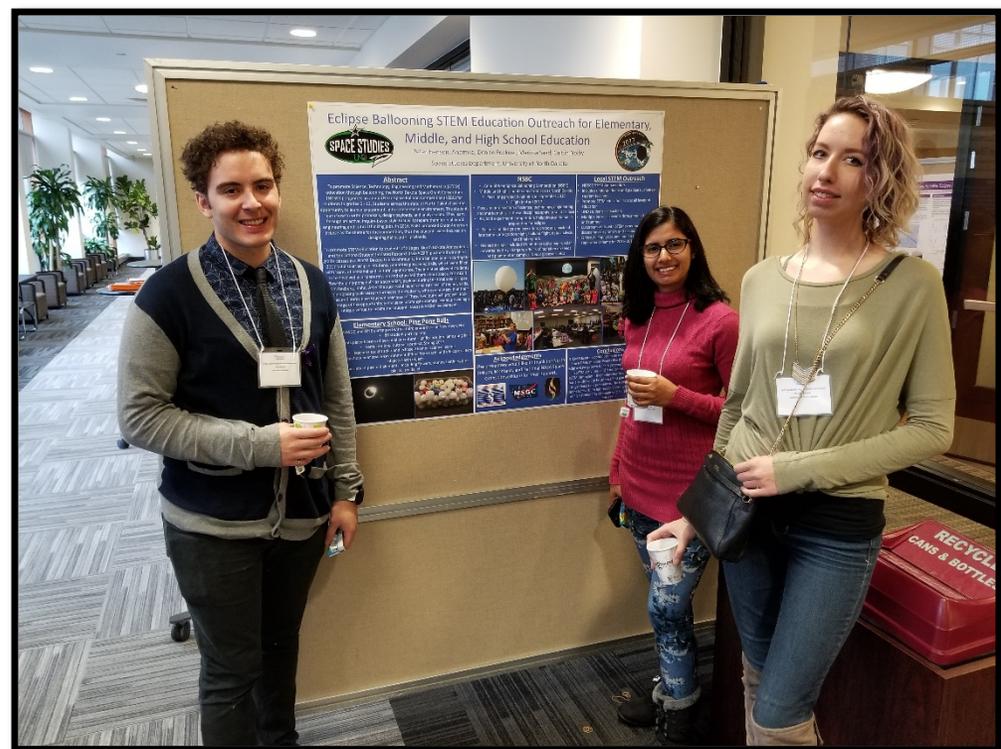
LRSC, UND, MaSU, MiSU, SBC, UTTC, NDSU

2015-2020

# Student Travel Grants

*All travel is paused until it is safe to travel.*

- Travel to conferences to present research or attend hands-on workshops
- New: \$1000 awards
- *Rolling applications to change to each semester*
- Previous years' applicants from UND and NDSU
- Encourage students at affiliate institutions to apply!

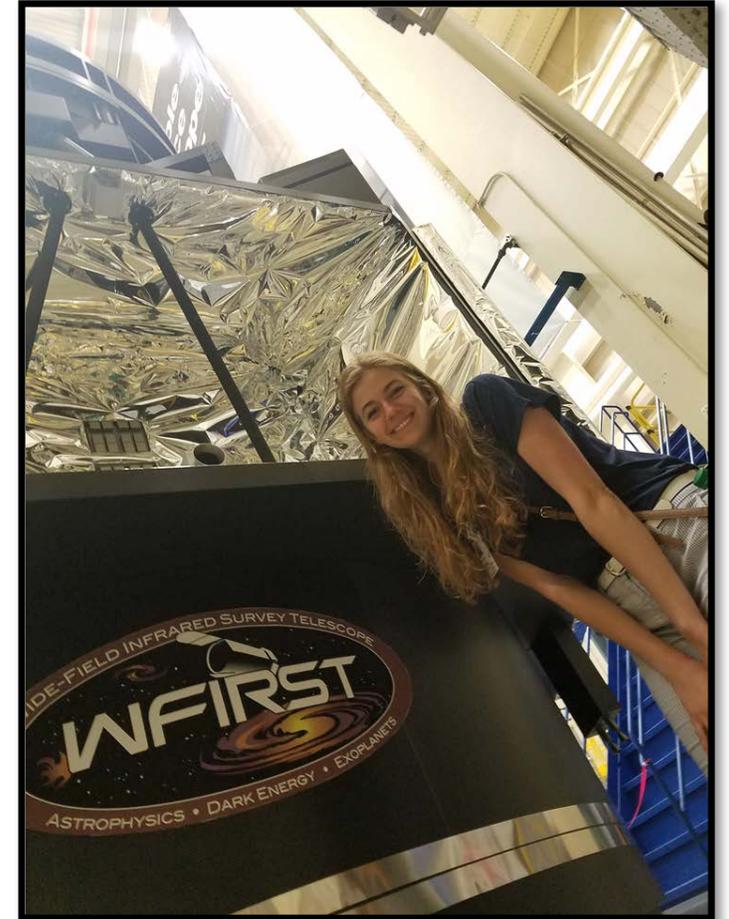


# NASA Internships and Teams

*all will follow NASA and NDUS covid-19 guidelines*

- NASA Competition Teams
  - Application deadline for everyone, **November 15<sup>th</sup>**
  - Highly encourage college teams from outside UND and NDSU
    - Two new FIRST Robotics teams this past year
- NASA Internships
  - Encourage students from affiliate institutions to apply
  - **\$7300** undergraduates, **\$9000** graduate students
  - **2020 ND Summer applicants: 35 total\***
    - 2019 ND Summer applicants: 30 total
    - 2018 ND Summer applicants: 30 total
    - 2017 ND Summer applicants: 34 total
    - 2016 ND Summer applicants: 25 total

\*Internships are online/remote work only. ND selected 9, only 1 could make it remote.



New programming and upcoming opportunities

# Educator Opportunities

## Internal

- Pre-service sessions are 1-3 hours long
- In-service sessions held each summer for 1 PD credit (15 hrs.)
  - Online, multi-session PD workshop on Zoom (coding Spheros, NASA "expert" Q+A, at-home activities, etc.)
- Host "Space Camp" for students
- *Online options are available for all.*

## External

- Space Camp for Educators
  - Marshall Space Flight Center, Houston Space Center, Kennedy Space Center
- Space conferences
  - SEEC, LiftOff, SPACE, etc.



## Discussion from past two affiliates meetings:

- **Bridge program**
  - **Past:** invite students who are transferring from one degree program to another (AS to BS, BS to MS, etc.). This can be at the same institution.
  - **New:** transferred the summer session to the two weeks before school starts. Although this summer, all remote work.
- **NASA Internships**
  - Continue to advertise to non-STEM students, such as graphic designers, communications, etc. and students across the state.
- **Student Involvement**
  - More classroom visits across the state (affiliate representation at fairs).
- **Communication**
  - **Keep improving social media presence** (STEM Ambassadors)
  - **Update:** new NDSGC application platform. Submittable helps collect and review apps
  - Will advertise new programs (i.e. mini-grants)
- **Meetings**
  - (Non-pandemic meetings) Keep it at two days; if it was a one day meeting, many people have to travel far, making it a two-day trip anyways. At UTTC for next in-person meeting?

## Educator Mini-Grants (K-12)

- Competitively awarded [travel](#) and [material requests](#) from ND K-12 and informal educators who are:
  - Teaching, hosting, or participating in research or education initiatives related to STEM and/or NASA
  - Engaging in STEM activities, competitions, challenges, field trips, space camps, and/or research opportunities.
- RFP to come out this summer

## Affiliate Mini-Grants (College)

- Open to NDSGC affiliate representatives who are hosting or participating in research or education events related to STEM and/or NASA.
  - Family Science Days, Apollo 50<sup>th</sup> Outreach Events, Water Festivals, Marketplace for Kids, STEM Exploration Days, etc.
  - [Materials](#) funding for their STEM courses and research, or [travel](#) funding for their college students to participate in field research related to their STEM courses
- RFP to come out this summer

## Faculty Seed Research Grants

### Research Focus Areas (RFA)

*[Faculty]*

- Faculty interested in research areas defined in the strategic plan can apply for FRA funding.
- Year-long awards
- POP: 8/16/20 – 8/15/2021
  - Submittable application
    - RFP to come out this month

## College Student Research Grants

- College students requesting specific research materials and travel (i.e. thesis or dissertation materials)
- Applications:
  - sent to our Submittable platform
  - CFP every semester
- Awards up to \$1,000

## Future Work

## Building a diverse and skilled workforce

- ND Vision Services/School for the Blind
  - Continue collaborations through the:
  - STEM Ambassador program
  - Pre-college
  - Informal education
- Developing connections with the ND Center for Persons with Disabilities at Minot State University



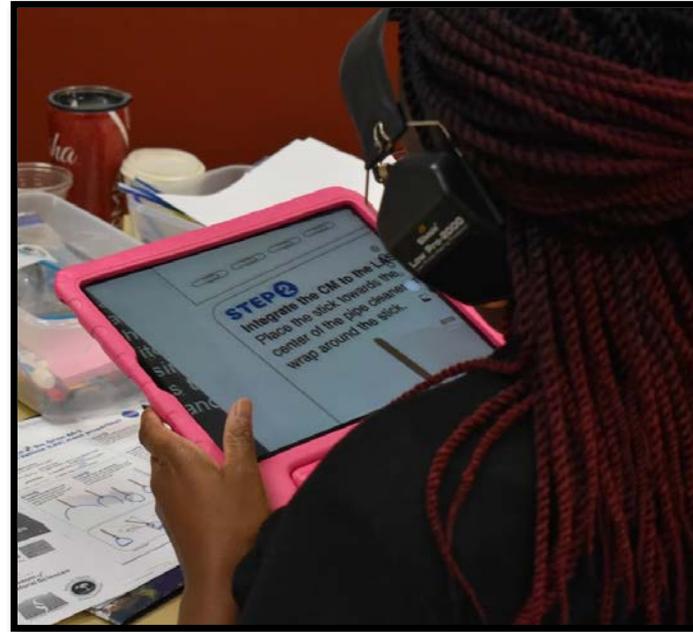
## Innovative Differentiated Exploration Activities in Space Science (IDEAS)



### Partnership with NC and SC Space Grant

- Provide educators with students with special needs with NASA Next Gen STEM **resources**
- Provide **recommendations** for modifications and future design issues
- Catalog “best practices” that can be used by NASA’s **digital badge program**

# Innovative Differentiated Exploration Activities in Space Science (IDEAS)



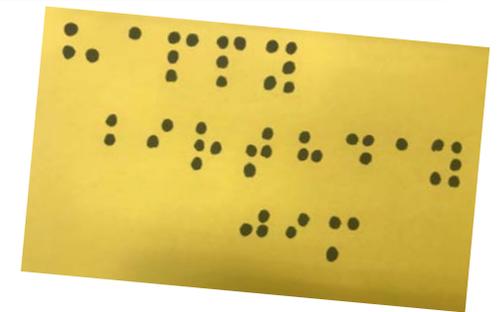
## Implemented at:

North Carolina's Museum of Science ✓

South Carolina Educator Workshop

NASA Langley Workshops

North Dakota Educator workshops



# GLEE

# GET INVOLVED

Interested in being a GLEEmer (one engaged with GLEE)? There are a variety of opportunities to get your GLEE on and get involved. Check out some of the options below.



## STUDENT TEAMS

If you are a part of a university, high school, or middle school and want to organize a student team, let us know you are interested by clicking [here](#). This is not a formal commitment so even if you are remotely interested, let us know. A more formal call for teams will happen by the end of 2019. Let's reach for the Moon together.

## CITIZEN SCIENCE

Available for anyone and everyone, **GLEE** will have an app to publicly share all collected data and to engage the public in project-related events. You can also sign up for our email list where you will receive updates on the state of the project, upcoming activities, and ways to contribute.

## SOCIAL MEDIA

**Like us? Follow us!**

Twitter: @GLEE2023

Instagram: @GLEEmission

Facebook: @GLEE2023

Reddit: r/GLEE2023

<https://www.glee2023.org/>

- *Timeline currently paused*
- **Spacecraft design by Dec. 2020**
- **LunaSat ready for teams by Jan 2021**

**Thank you all for your flexibility and  
continuous efforts to make us**

**#NASAinND**

**If you would like to be in our annual affiliates Meeting **photo**, please turn on your Video.**

## Discussion:

Do you see your institution participating in these new (or existing) activities?

Do you have any comments or suggestions regarding these programs?