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# NDSGC AURORA

NORTH DAKOTA SPACE GRANT CONSORTIUM | 2022 EDITION



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# NOTES FROM THE Director

Dear colleagues-

As we begin 2022, we reflect on the impact of the NDSGC this past year, and the teamwork that made it happen. Despite continued challenges, we stayed **connected** through in-person, virtual, and hybrid events, thanks to the creativity and resilience of our entire affiliate network. 2020 and 2021 brought opportunities for us to both continue existing partnerships and implement new programming, to better **connect** with communities across North Dakota.

New programming this past year included a number of opportunities to increase **connections** statewide. We established "Mini Grants" (p. 25 - 27) to more readily engage affiliate representatives, educators, and college students in research and education opportunities. We now hold monthly "Coffee Chats" (p. 5), where prospective students, funded students, and staff and faculty members of the affiliate network are invited to join in informal tag-ups. At these meetings, we share successes, challenges, and upcoming opportunities for funding and collaborations. (Please reach out if you'd like to **connect** with us through these engaging conversations!) 2021 also brought our first recipients of the North Dakota Vision Services/School for the Blind (NDVS/SB) Scholarship (p. 22). We are honored to have been able to **connect** with the NDVS/SB and grow in this partnership over the past few years.

The NDSGC maintains Diversity, Equity, Inclusion, and Accessibility (DEIA) initiatives as a central focus of all programming. In spring 2021, the NDSGC conducted space-themed Virtual Escape Rooms with students from the NDVS/SB (p. 39). Participants were able to **connect** in a virtual world and work together to navigate the solar system as an astronaut crew. We also presented in a "Career **Connections**" series, sharing STEM and Aerospace opportunities with individuals served by Independence, Inc., a "nonprofit committed to empowering individuals with disabilities, seniors, and people with behavioral health disorders to live independently." In summer 2021, the NDSGC continued collaborations with South Carolina and North Carolina Space Grant Consortia and NASA Langley Research Center in adapting NASA lesson plans to be accessible to all learners (p. 40-41). While many students, educators, and faculty of diverse backgrounds and identities were engaged across NDSGC programming this past year, we know that we always have room to improve, and we invite new engagement strategies as we look to the future.

Much of our impact is due to our ever-growing STEM Ambassador program (p. 29). Thank you to our team of dedicated college students for their continued enthusiasm and innovative ideas. Stay tuned for upcoming events and interactive opportunities developed and hosted by these stellar students!

As you have probably noticed, our goal this past year was to foster an environment of **connectedness** between individuals, between institutions, between communities, and across the state and nation. None of these programs would be possible without the efforts of our dedicated team, affiliate network, and talented students. We look forward to continued opportunities to foster **connections** in all things STEM and NASA. Together, we are #NASAINND.

Thank you for your continued support,

*Caitlin Milera*

Caitlin Milera  
Director, NDSGC



**WHAT IS SPACE GRANT?**

NASA initiated the National Space Grant College and Fellowship Program, also known as Space Grant, in 1989. Space Grant is a national network of colleges and universities. These institutions are working to expand opportunities for Americans to understand and participate in NASA's aeronautics and space projects by supporting and enhancing science and engineering education, research and public engagement efforts. The Space Grant national network includes over 950 affiliates from universities, colleges, industry, museums, science centers, and state and local agencies. These affiliates belong to one of 52 consortia in all 50 States, the District of Columbia, and the Commonwealth of Puerto Rico. The 52 consortia fund fellowships and scholarships for students pursuing careers in science, technology, engineering, and mathematics, or STEM, as well as curriculum enhancement and faculty development. Member colleges and universities also administer pre-college and public service education projects in their states.

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# SPACE GRANT Meetings

## NATIONAL SPACE GRANT MEETING

Traditionally, all fifty-two consortia meet in Washington D.C. for the national Space Grant meeting. Due to COVID-19 precautions, the national Space Grant meeting was hosted online rather than in-person in 2021.

In 2021, NASA's Office of STEM Engagement (OSTEM) hosted a two-day, interactive, virtual conference where NASA personnel and all fifty-two Space Grant Consortia came together to network, facilitate dialogue on best practices for STEM engagement, and discuss NASA's upcoming projects and missions. An interactive virtual exhibit hall even allowed attendees to create their own avatars. Keynote speakers included acting NASA Administrator, Steve Jurczyk and NASA Astronaut, Chris Cassidy.

## CAPITOL HILL MEETINGS

NDSGC's annual meetings in Capitol Hill were moved online in 2021 due to COVID-19 precautions. The NDSGC was excited to visit with U.S. Senator Kevin Cramer via telephone conference and to meet with staff from U.S. Senator John Hoeven's office as well as individuals from U.S. Representative Kelly Armstrong's office via Zoom. NASA-related research and education projects, STEM, and the technical workforce of North Dakota were among the topics discussed in the meetings.

The NDSGC is grateful for all the support Senator Cramer, Senator Hoeven, and Representative Armstrong provide from Washington, D.C.

Top Right: Better Together Logo

Middle Right: The NDSGC Core Team on Zoom.

Bottom Right: The NDSGC Core Team working together on a conference call.

# NASA STEM

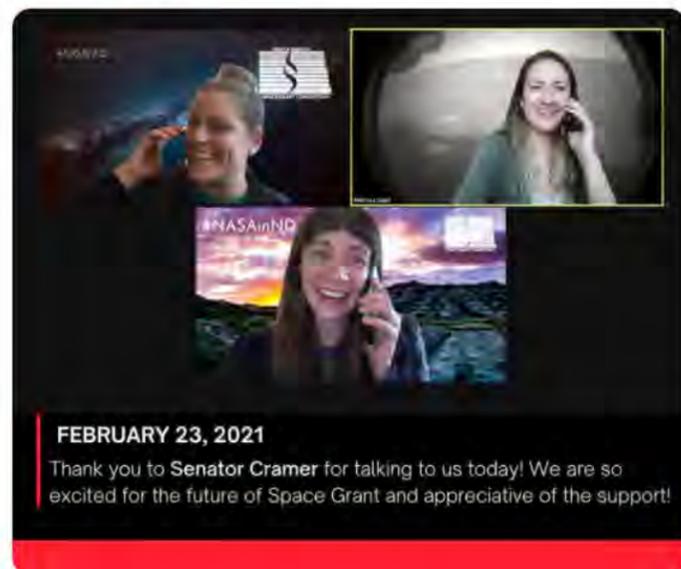
BETTER TOGETHER FOR STAKEHOLDER SUCCESS



← Tweet

NASA ND Space Grant @NDSGC

We just got off the phone with [@SenKevinCramer](#) and are appreciative of his support for NASA and STEM education in North Dakota. ND Space Grant will continue to empower students, educators, and researchers across the state. [#NASAinND](#) [#NorthDakota](#)



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LEARN MORE ABOUT NDSGC'S AFFILIATES!  
[ndspacegrant.und.edu/about/affiliate-members](https://ndspacegrant.und.edu/about/affiliate-members)



NDSGC affiliates and NDSGC-funded students and competition teams from 2019, 2020, and 2021 gathered online for the 2021 Student Symposium and Affiliates Meeting. Pictured: UND President Andy Armacost speaking at the 2021 Student Symposium and Affiliates Meeting.

# AFFILIATE Involvement

## AFFILIATES MEETING

Starting in the Winter of 2020 and continuing through Fall of 2021, the NDSGC lead informational booth sessions, pre-service educator workshops, career fairs, meetings, and virtual reality experiences online. The annual NDSGC Affiliates Meeting was held virtually on April 16th & 17th, 2021. During the meeting, the NDSGC team presented 2020 accomplishments and new funding opportunities to faculty and staff. NDSGC funded students and competition teams presented their work from the 2020-2021 academic year.

University of North Dakota President, Andrew Armacost, opened the meeting with an inspirational speech while the University of North Dakota's Dean of Aerospace, Robert Kraus, joined on Saturday to watch students present their work.

## COFFEE CHATS

To encourage continuing virtual engagement, the NDSGC started hosting monthly Coffee Chats. Coffee Chats are hosted to provide a time and place for the NDSGC to touch base with affiliates and students. Affiliates and students are encouraged to ask questions about NDSGC programming, share upcoming events, celebrate successes, and cultivate new connections.



Coffee Chat slide decks from the past year.




[READ MORE ABOUT THIS MISSION IN THE SPACESUIT LAB BLOG](https://spacesuitlab.blogspot.com)  
[spacesuitlab.blogspot.com](https://spacesuitlab.blogspot.com)

Above: UND Aerospace PhD candidate Terry Rector, UND Mechanical Engineering student John Merila, Space Studies faculty member Dr. Keith Crisman, and the Mission IX crew having a debrief.



**10 YEARS OF THE ILMAH!**  
 The Habitat celebrated its 10-Year Anniversary in 2021.  
*Right: Dr. Pablo de Leon, PI of the Human Spaceflight Laboratory, leads a tour of the ILMAH.*



## INFLATABLE LUNAR/ MARS ANALOG **Habitat**

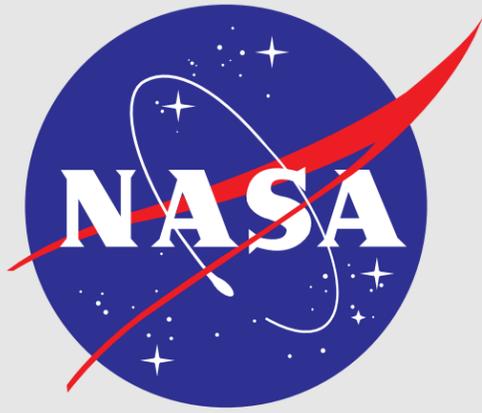
**FROM MAY 4TH TO MAY 17TH, 2021, MISSION IX OF THE INFLATABLE LUNAR/MARS ANALOG HABITAT (ILMAH) WAS CONDUCTED.**

The crew consisted of four UND students: Sophie Bielawski, Jacquelyn Emery, Will Green and Steven Russell. While inside the ILMAH, the four-person crew conducted a 2-week mission focused on neuroscience studies including EEG based cognition performance. In addition to the neuroscience studies the crew practiced extravehicular activities, spent time in space suits designed at UND's Human Spaceflight Laboratory, cared for plants inside the ILMAH, and conducted drone flights.

Left: John D. Odegard School of Aerospace Sciences Dean, Dr. Robert J. Kraus enters the ILMAH.



The Inflatable Lunar/Mars Analog Habitat (ILMAH) has five modules: the living quarters module, a botany/greenhouse module, geology module, exercise module, and an extravehicular activity (EVA) module. Docked to the ILMAH via a tunnel is the Pressurized Electric Rover (PER), which students used to conduct EVAs outside of the habitat.



# NASA Internships

## THE NDSGC IS COMMITTED TO SUPPORTING NORTH DAKOTA STUDENTS IN NASA INTERNSHIPS.

Students who are US citizens and enrolled at NDSGC-affiliated institutions will be able to engage in authentic, hands-on learning experiences that involve real-life problem-solving. Additional competitiveness and inclusive criteria of NASA internship opportunities are determined by respective NASA centers and industry mentors.



### SHAWN CVETEZAR

Spring 2021 | University of North Dakota  
Mechanical Engineering  
Internship Location: Marshall Space Flight Center

#### NASA Human Exploration Rover Challenge

"NASA provides something no other employer can provide, that feeling of family. Being a NASA intern means you'll forever be in the NASA family. It's where people like me go to pursue their dreams, feed their passions, and to fulfill their life-long goals. NASA unconditionally embraces you to succeed and feel at home."



### ERIN DOYLE

Summer 2021 | University of North Dakota  
Atmospheric Sciences  
Internship Location: NASA Headquarters

#### History of Earth Science Applications

"For my internship I worked with the History Division on a project researching the history of Earth Science applications regarding water management within the agency. This involved meeting with researchers and leaders across the agency to discuss their work, compiling resources and writing a report detailing my findings. This was a great opportunity to network, enhance my communications skills, and learn more about the history of NASA!"



### BRIANNA BREAUX

Summer 2021 | Minot State University  
Chemistry, Plant Biochemistry Concentration  
Internship Location: Kennedy Space Center

#### How Does Ionizing Radiation in Space Impact the Vitamin Content of Plants?

"I met professionals involved in different scientific pursuits related to space travel and basic research, which broadened my sense of what is possible through a science education."



### KEVIN JORDAN

Summer 2021 | University of North Dakota  
Electrical Engineering  
Internship Location: Ames Research Center

#### Sustainable Extraterrestrial Construction and Instrument Deployments

"Interning at NASA Ames is a tremendous opportunity - a dream come true! To network and learn from the incredible minds at my center and others, and to soak up the NASA family culture all while serving my country is a true blessing. I am honored to have received this grant!"



### MANNA KHAN

Summer 2021 | University of North Dakota  
Earth System Science and Policy Graduate Program  
Internship Location: NASA Headquarters

#### The Past and Present History of Earth Science Applications Using the NASA Database Regarding Bangladesh Tropical Cyclone Forecast Advancement

"Working at NASA Headquarters this summer allowed me the opportunity to work with a diverse group of people, network with many scientists, and gain knowledge. As a non-traditional woman student, the NASA internship has strengthened my confidence that women are as powerful as men."



## SIMON KROLL

Summer 2021 | North Dakota State University  
Computer Engineering & Electrical Engineering  
Internship Location: Goddard Space Flight Center

### RSA File Signature Verification implementation in cFS's File Manager Application

"Before receiving an award from the ND Space Grant Program, I would have never imagined that I would get the opportunity to work for NASA. Thanks to the program, I've gained hands-on experience in the aerospace industry and been able to apply my education to make contributions to the future of spaceflight. Interning at NASA's Goddard Space Flight Center provided an amazing hands-on experience developing software for real-world applications as part of a large development team. My mentor assigned a project that perfectly matched my interests in coding and computer security and helped me to network with seasoned professionals and fellow interns."



## MAHDI SAEEDI

Summer 2021 | University of North Dakota  
Computer Science, Mathematics  
Internship Location: Goddard Space Flight Center

### Cloud Mission Client Hub

"Ever since I was a kid I wanted to work at NASA. Getting an opportunity to create a cloud-native application from the ground up knowing it will be used by NASA employees for years to come is a surreal experience. This experience allowed me to grow as a software engineer by providing me the experience to design and deliver a tool from within a team from the ground up."



## JOHN MERILA

Summer 2021 | University of North Dakota  
Mechanical Engineering  
Internship Location: Langley Research Center

### ASSEMBLERS Project

"This internship at LARC working on the ASSEMBLERS Project has allowed me to gain experience working with and learning about robotic systems and all the design work that goes into them. The work that I was able to do during my NASA internship through the North Dakota Space Grant allowed me to work in a field that I hope to enter as a career, gaining valuable knowledge and experience."



## DANIEL TRIEFF

Summer 2021 | University of North Dakota  
Mechanical Engineering  
Internship Location: Langley Research Center

### 3D Printing MAB Phase Ceramics

"This award gave me a very unique opportunity to perform research for NASA this summer and further my career as an engineer."



## HARUKA KIDO

Summer 2021 | University of North Dakota  
Electrical Engineering  
Internship Location: Goddard Space Flight Center

### Embedded Processing: Development of MIPI Camera Interface Prototype Adapter Board

"My participation in NASA's internship provided me engineering analysis and design tools used in the electrical engineering industry, allowed me to understand the process of circuit design undertaken by NASA's projects, and showed me the applicability of concepts taught in university to space engineering problems. I'm thankful for the opportunity to contribute to NASA's SpaceCube Mini processor card's MIPI Camera Serial Interface adapter board, especially because it combined my passion for digital imaging, celestial science, and engineering into practice."

# STUDENT RESEARCH Fellowships

The NDSGC Student Research Fellowships are available to students completing NASA-relevant research in a STEM field under the guidance of a faculty mentor. Awards are offered throughout the fall, spring, and summer semesters to undergraduate and graduate students at NDSGC affiliate colleges. All NDSGC Student Research Fellowships are awarded on a competitive basis.

## FALL 2020



### TERRY RECTOR

University of North Dakota  
Aerospace Science Graduate Program

#### Impacts on Cognitive Decay and Memory Recall during Long Duration Spaceflight

"Research to determine when the effects of long-duration spaceflight are costly and time-consuming when accomplished correctly. The NASA North Dakota Space Grant Consortium helped make my research possible. Thank you for your encouragement and support."

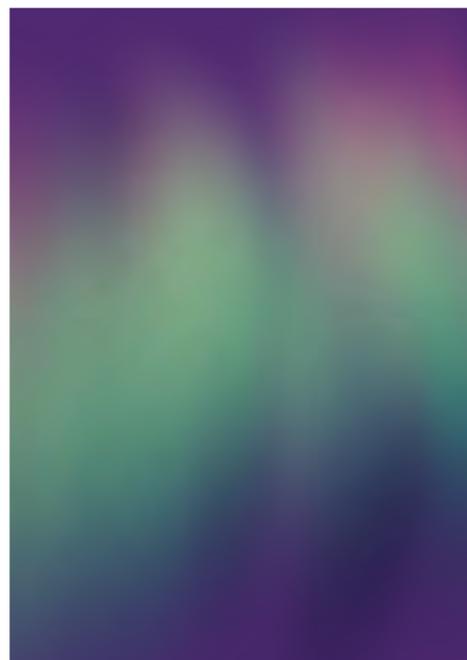


### LORI WATERS

University of North Dakota  
Space Studies Graduate Program

#### Legumes in Space: Red Clover symbiosis with Rhizobia Bacteria

"The NDSGC has facilitated invaluable experiences advancing my career in human spaceflight, especially plant research. By participating in the Student Research Fellowship, virtual NASA internship, and HI SEAS Analog Moon Mission, these extraordinary opportunities deepen my passion for space exploration."



### BLACKBURN

University of North Dakota  
Space Studies Graduate Program

#### Spicing Up Space With In-Situ Chile Pepper Plants



### AMANDA WINTER

University of North Dakota  
Space Studies Graduate Program

#### Changes in the Survivability of Biofilm Due to Rapid Changes in Gravity

"Without this grant, it would have been impossible to pay the fees required for sub orbital flights. I had to purchase all my own equipment, including media dishes, recording equipment, as well as paying for the zero gravity flight itself."



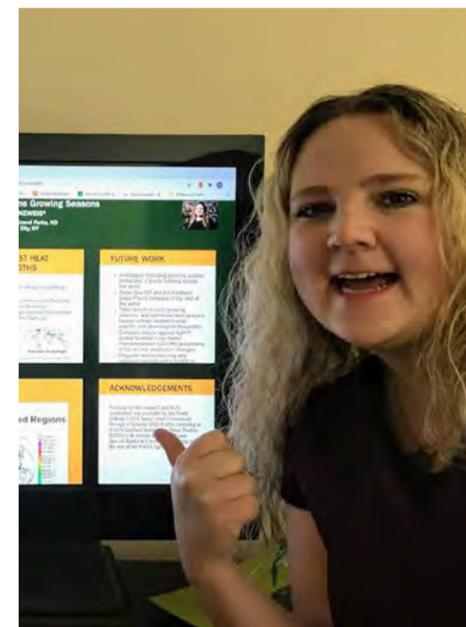
### DANIEL BRUNSON

University of North Dakota  
Geology Graduate Program

#### Thermal Modeling of the Yellowstone Volcanic Complex: Implications for Crustal Structure of the Magma System and Eruption Dynamics

"Despite precarious and uncertain worldwide circumstances, the Student Research Fellowship offered by NDSGC and NASA provided the means and motivation to move forward with the research necessary to make progress on my dissertation project."

## SPRING 2021



### KAELA LUCKE

University of North Dakota  
Atmospheric Sciences Graduate Program

#### Agroclimatic Extremes Limiting Growing Seasons Under Climate Change - North Dakota and Beyond

"The 2021 Spring Fellowship helped me further my agriculture climate modeling research that was previously started with my 2020 summer internship. This would not have been possible without the NDSGC's help. This experience has inspired me to focus my future career on Ag-Climate modeling research and outreach after I graduate."

## SUMMER 2021

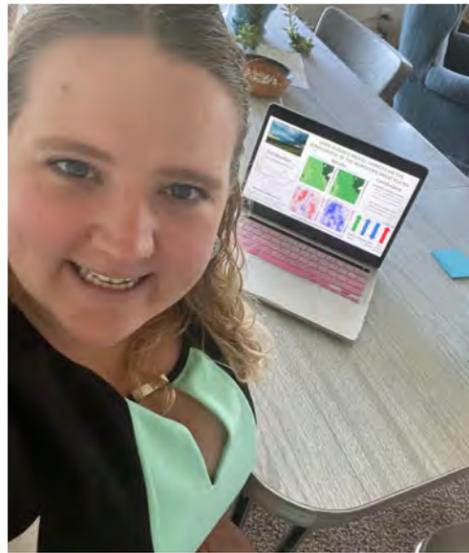


### GEENA BROADWATER

Minot State University  
Biology/Pre-Veterinary Medicine

#### Ichthyofauna and Benthic Macroinvertebrate Communities

"Through the ND Space Grant Student Research Fellowship, I have been able to pursue my interest in aquatic biology. This fellowship has allowed me to study the highly complex aquatic systems and fish/benthic macroinvertebrate assemblages of the Midwest. As I wrap up my senior year at Minot State University, I look forward to utilizing my new skill set in my future work opportunities."



### KAELA LUCKE

Summer 2021 | University of North Dakota  
Atmospheric Sciences Graduate Program

#### Agroclimatic Extremes Limiting Growing Seasons Under Climate Change - North Dakota and Beyond

"The 2021 Summer Fellowship as well as my past Fellowship/Internship with NASA GISS has been a dream come true. It has shown me how my research can be applicable and help the real world and has inspired me to focus my future career on Applied Agricultural Climate modeling and research while trying to educate and help the farmers become more sustainable. Thank you NDSGC, this would not have been possible without your help."



### BRADLEY HOFFMANN

University of North Dakota  
Biomedical Engineering Graduate Program

#### Cardiovascular Predictive Metric of Crew Energy Expenditure and Thermal Loading

"I am beyond grateful for the research experience provided by the ND Space Grant Program. It allowed me to guide my own research in space suit human performance propelling my thesis work forward. From this experience, I am ahead in my graduate work in pursuit of a PhD in Biomedical Engineering."



VINCENT LEDVINA | @VINCENTLEDVINA

Exploring frozen lakes underneath a display of aurora borealis at Kelly's Slough Wildlife Refuge in January, 2021.

# NATIONAL STUDENT Competitions

## UND NASA STUDENT LAUNCH

This year's Advanced Rocketry Club at UND strived to design a rocket that could reach an altitude of 2400 feet. They started with a small-scale design before moving on to designing and constructing a 10-foot-tall rocket. The airframe of this year's rocket was made of fiberglass. The team hopes to incorporate more fiberglass into next year's design due to its durability.

Throughout the season each member of the team gained valuable insight regarding the design and construction of rockets, engineering decision matrices, working with fiberglass, and using tools of the trade. Under the guidance of their advisor Tim Young, the team was awarded 3rd place in the Rookie Team Award category at the NASA Student Launch awards on June 3rd, 2021.

## NDSU DESIGN, BUILD, FLY (AIAA)

NDSU's Design, Build, Fly team did just that- they designed, built, and flew a remote-controlled aircraft which they named Balsa Grey Duck. This year's competition goal was to have their airplane deploy a sensor packaged in a small container, mid-flight, then recover said sensor before landing. NDSU's Balsa Grey Duck completed over five successful test flights and from there placed in the 2020-2021 AIAA Design, Build, Fly competition.

Through this competition NDSU's Design, Build, Fly team learned valuable technical engineering design skills and gained hands-on experience in designing, manufacturing, and testing a remote-controlled aircraft from start to finish. Post-graduation, team members will be able to continue learning from their experiences as they transition into the workforce. NDSU's Design, Build, Fly team is advised and mentored by Bora Suzen.

"We are grateful that the ND Space Grant Consortium was able to help support our senior design project. The experience was very educational and is sure to have lasting positive impacts on our entire team. We hope that our ideas and designs may help lay the foundation for future Pathbuilder-related projects in North Dakota and at NASA."

-Kimberly Whaley, Pathbuilder Project team member

## ^ NDSU PATHBUILDER X-HAB TEAM

A group of 19 engineering students from NDSU, along with their advisor Jessica Vold, worked together to design and build a rover for NASA's M2M X-Hab competition program. The goal of the competition was to design and build a prototype rover that had the capability of engineering flat, compact areas on the lunar surface so roads and foundations can be built. Mentored by NASA experts, NDSU's "Pathfinder Project" was a smashing success as the team and their rover were recognized as a one of the seven winners in this national competition! The rover that was built is on display at NDSU. It will be used to educate and recruit students.

## NDSU NASA HUMAN EXPLORATION ROVER CHALLENGE

NASA's Human Exploration Rover Challenge asks college teams to design and build a human-powered rover that could be used for future space missions, allowing humans to transverse across the moon. Teams gather for the competition each year in Huntsville, AL, where they test their prototypes on an elaborate racetrack. This year's team at NDSU had five members in total and four of them were women. The team was led by their advisor Ghodrati Karami.

Students had a positive experience working on their rover and their participation on the team provided them the opportunity to navigate a project from inception through completion.

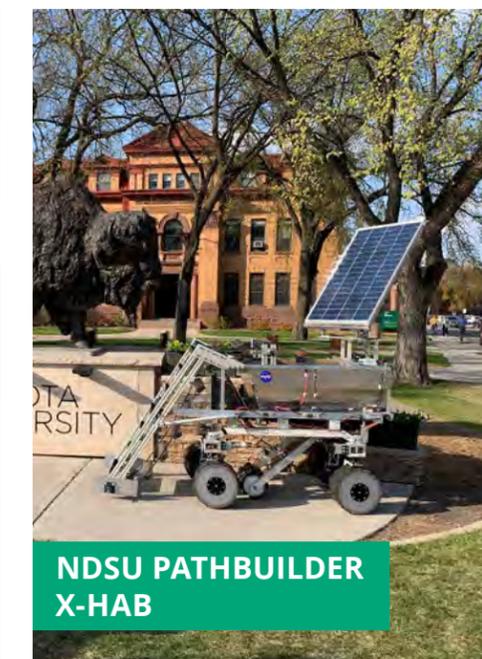
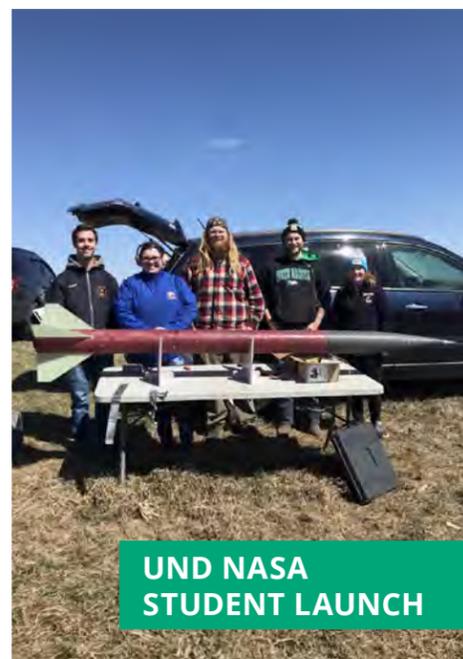
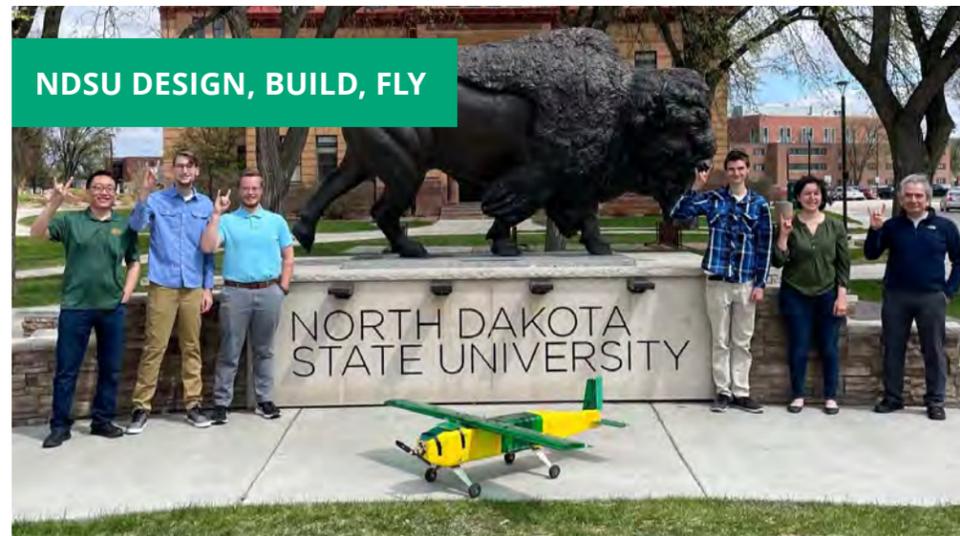
## UND FSAE RACECAR TEAM

Recently, UND's Formula SAE team comprised of 24 undergraduate engineering students and their advisor Djedje-Kossu Zahui. Each year, teams competing in the Formula SAE competition are challenged to conceptualize, design, manufacture, test, then race a small, open-wheeled racecar. Once the racecar is complete, university teams from around the United States gather and are judged by professional automotive engineers in the categories of design, cost, business organization, and vehicle performance.

## NDSU ROBOTICS MINING COMPETITION

NASA's Robotics Mining Competition challenges students to design and build a robot capable of mining ice and minerals on the moon. This year's NDSU Robotics Mining team had three returning members and eight new members, all collaborating both online and in-person. The returning members led the team in designing and prototyping a robot that took into consideration competition constraints such as budget, power, weight, and collection efficiency. Although limited access to the robot due to COVID-19 restrictions was challenging, each team member gained real-world skills and valuable insight during the planning, designing, and building of their robot. Students with little to no experience are welcome to join this team and its advisor Majura Selekwa.

## NDSU DESIGN, BUILD, FLY



The North Dakota Space Grant Consortium proudly provides funding to students participating in national competitions such as NASA's Robotics Mining Competition and the Formula SAE Race Car Competition. It is imperative that students be given the chance to partake in these events as they strengthen a student's collaboration and problem-solving skills while promoting innovation.

Scheduled competition dates were interrupted due to the COVID-19 pandemic. Many of the national competitions adapted by hosting virtual seminars instead of in-person competition events.



# SUMMER FACULTY Fellowships

Summer Faculty Fellowships are designed to assist faculty in creating or revising a college-level course that is part of the Science, Technology, Engineering, or Mathematics (STEM) field and is NASA-relevant. This program directly supports one of the goals of NASA Education, and the overall goal of this program is to increase the exposure of college students to NASA and NASA research.



## KYLE REEPING

Natural Sciences, Dickinson State University  
General Chemistry I/II Lab

"The unification of theory and experiment is one of the most grandiose goals of any scientist, so much so that we've spent centuries striving to achieve it. Too much in early science education is experiment passed over in favor of theory. With the work I've completed this summer, I hope to stress the importance of experiments and their role in how we've arrived at the theories we learn in class now."



## DAVID DEMUTH

Science, Valley City State University  
Introductory Astronomy, Physics 110

"The North Dakota Space Grant Consortium's Summer Faculty Fellowship program has prompted my summer long focus to learn and develop new ways of teaching astronomy to undergraduates who are increasingly demanding a more flexible learning environment."



## ANGELA BARTHOLOMAY

Science, Dakota College at Bottineau  
Organic Chemistry I Lab

"This fellowship provided me with the opportunity to create labs for the new Organic Chemistry Class being offered to the DCB students through IVN."



## THORPE HALLORAN

Biology, Minot State University  
Fisheries Management

"This fellowship allowed me to work with several students collecting ichthyofauna in small-order prairie streams. In addition, we examined the seasonal nearshore distribution of fishes in Lake Metigoshe. Both of these studies relied on electrofishing. It was extremely rewarding to work with undergraduates as we sampled these systems. The specimens we collected also significantly expanding the university's teaching collections."

*Pictured (L to R): Geena Broadwater, Sam Paszek, Bernard Thorpe Halloran, and Hallie Tranby*

# AWARDED Scholarships



## PEARL I. YOUNG SCHOLARSHIP

*The Pearl I. Young Scholarship is a \$2500 scholarship competitively awarded to a UND female or non-binary student with a GPA of 3.5 or greater.*

### SYDNEY MENNE

"I am in my second year at the University of North Dakota, and the North Dakota Space Grant Consortium has already played a big role in my academic career. After my first year, I applied for and received a NDSGC Summer Student Research Fellowship. I am a double major in physics & astrophysics and mathematics, so I decided to conduct research on supernovae, a topic in astrophysics I am interested in. This research experience played a significant role in realizing my ultimate goal; to work in a national or international lab conducting research in astroparticle physics. I am aiming to get a PhD in

astroparticle physics to achieve this goal. Additionally, I have recently been accepted to the NDSGC STEM Ambassador Program, and I am really looking forward to encouraging and supporting students to follow their dreams and pursue a career in STEM. On campus, I am involved in various organizations. I am president of the UND Nordic Ski Club, vice-president of the Honors Program Student Organization, and involved with the Advanced Rocketry Club and the Big Event volunteering organization. As a self-supporting first-generation student, this scholarship goes a long way, and I am so thankful to have received it."



## LILLIAN GOETTLER SCHOLARSHIP

*The Lillian Goettler Scholarship is a \$2500 scholarship competitively awarded to an NDSU female or non-binary student with a GPA of 3.5 or greater.*

### MEGAN KONGABLE

"I am a third-year student studying Mechanical Engineering with an emphasis in Coatings and Polymers at North Dakota State University. I am a member of the Society of Women Engineers (SWE) and enjoy volunteering with the different outreach programs. My favorite outreach program to volunteer with is SWE Techkids. I work with a team to plan lessons and teach elementary aged kids about a variety of engineering disciplines through activities and experiments. After college, I plan to pursue a career in polymer research to develop affordable, environmentally-friendly polymers while

continuing to participate in outreach and inspire the next generation. I am very grateful for the support from NDSGC allowing me to focus on my education and volunteer work at NDSU!"

## NDSGC SCHOLARSHIPS

Every academic year, the NDSGC provides each of the affiliate two-year, four-year, and Tribal colleges with scholarship funding. Students are selected by faculty at their home institution. Students must have an excellent academic record and be majoring in a STEM field.

### BISMARCK STATE COLLEGE

Jace Dew  
Bobbie Gieser  
Lane Goehring  
Cole Hardy  
Ethan Hardy  
Ty Hornbacher  
Isaiah Leingang  
Jaden Mitzel  
Dustin Ross  
Talon Tschider  
Brandon Weist

### CANKDESKA CIKANA COMMUNITY COLLEGE

Garrett Allery  
Nicholas Bittner  
Nateisha Delorme  
Brittany Omen  
Ricki Rainbow

### DAKOTA COLLEGE AT BOTTINEAU

Connor Beck  
Anna Buzzerd  
Sarah Frey  
Alexis Gullett  
Courtney Herman

### DICKINSON STATE UNIVERSITY

Amanda Centko  
Isabel Lopez  
Dawson McGlothlin

### LAKE REGION STATE COLLEGE

Breonna Rance  
Tucker Salander  
Hannah Lundebly  
Jarrel McGarvey

### MAYVILLE STATE UNIVERSITY

Simon Barker  
Hayle Boechler  
Lexi Carpenter  
Kaitlin Engin

Trevor Gravseth  
Laura Jacobson  
Victoria Johnson  
Frida Kjelland  
Sierra McCall  
Taylor Painter  
Creighton Pfau  
Taylor Stegman  
Ashlyn Tingey  
Austin Urlaub  
Paul Willis McSteves

### MINOT STATE UNIVERSITY

Nicole Anderson  
Jessica Bingham  
Breanna Breaux  
Raylea Folstad  
Spencer Furniss  
Ross Hardy  
Jacob Jensen  
Je-Mario Jones  
Noah Keller  
Kellen Peat  
Kaitlynn Quintana  
Travis Smith  
Keegan Summers  
Forest Weigel

### NORTH DAKOTA STATE COLLEGE OF SCIENCE

Andrew Johnson  
Isabel Thomas  
Isaac Larson  
Kevin Revier  
Levi Schwab  
Megan McWethy  
Christopher Mohr  
Dillon Strommen

### NUETA HIDATSA SAHNISH COLLEGE

Laurice MorningStar  
MacKenna Murdock-Moore  
Bryann Rainbow  
Janna Steen

### SITTING BULL COLLEGE

Elena Rodriguez  
Kelcie Two Shields  
Louise Uses Knife

### TURTLE MOUNTAIN COMMUNITY COLLEGE

Stetson Baker  
RaeAna Cromwell  
Falynn Ferris  
Gavin Parisien

### UNITED TRIBES TECHNICAL COLLEGE

Brett Alberts  
Jayce Archambault  
Cody Guardipee  
S'yna Sanchez

### VALLEY CITY STATE UNIVERSITY

Alexis Bentz  
Rachel Blomquist  
Sydney Brunmeier  
Breanna Erlandson  
Katie Gehrig  
Danika Green  
Harmony Hennings  
Kourtney Hintz  
Brooke Kaiser  
Lindsey Kieker  
Andrew King  
Ariyana Malec  
Ethan Rasset  
Noah Schaeffer  
Jaden Scott  
Konnor Stueve  
Colton Taylor  
Cole Thompson  
Skylar Yarbo

### WILLISTON STATE COLLEGE

Shane Buxbaum  
Brady Doesden  
Luis Maria

## AMERICAN INDIAN SCHOLARSHIPS

American Indian Scholarships are awarded to students at each of the five Tribal colleges. Students awarded have an excellent academic record and plan to complete a four-year degree in a STEM field. Students are selected by faculty at their home institution.

**CANKDESKA CIKANA  
COMMUNITY COLLEGE**

Jerrica Guy

**NUETA HIDATSA SAHNISH  
COLLEGE**

Ethan Wells

**SITTING BULL COLLEGE**

LaTawna Pille

**TURTLE MOUNTAIN COMMUNITY  
COLLEGE**

Trever Thomas

**UNITED TRIBES TECHNICAL  
COLLEGE**

Jerral Murray

## NORTH DAKOTA VISION SERVICES/SCHOOL FOR THE BLIND SCHOLARSHIP

The NDSGC, through a partnership with North Dakota Vision Services/ School for the Blind (NDVS/SB), is now awarding an annual NDVS/SB & NDSGC Scholarship.

The scholarship was awarded for the first time during the 2020-2021 academic year.



**MENUKA RAI**

“My name is Menuka Rai. I am a Psychology and Physical Therapy student at the University of North Dakota. I have always dreamt of working in the health care field. Receiving this scholarship has helped me to further my education and to get one step closer to achieving my dream. I am grateful to NDSGC and NDVS/SB for granting this scholarship.”

**DIETRICK SCHLICHTMANN**

“Hello, I am Dietrich Schlichtmann, and I am approaching graduation from the University of North Dakota with Entrepreneurship and Honors majors and a Mathematics minor. While previously on track to embark on the path of a career in Math Education, I have adjusted my focus towards public service and philanthropic projects. I am still a strong supporter of mathematics and science. While attending UND, I have spent most of my time on my studies, however I still

found ways to partake in campus life. I am a percussionist for the University Band, I have been a part of the chess club, and I am involved in my church’s services and Bible studies. I was also a North Dakota State 4-H Ambassador for four years. In my personal time, I enjoy reading, playing board games and card games, listening to and playing music, and spending time with my family. I am grateful to NDSGC for granting this opportunity to complete my college education.”



# SPACE GRANT ALUMNI SUCCESS STORIES Where are They Now?



**ALEXANDER SWANSON**

**NDSGC Involvement:** Competition Team Funding Recipient

**Education:** University of North Dakota, B.S. in Mechanical Engineering

**Where are you now?** University of Michigan pursuing a Master of Science in Engineering and Automotive Systems Engineering

**Advice to Students:** Ask as many questions as you can if you don’t understand a topic. Most of all don’t forget to have fun!



**DENISE BUCKNER**

**NDSGC Involvement:** Fellowship Recipient

**Education:** University of North Dakota, M.S. in Space Studies

**Where are you now?** PhD student (second year) in Geological Sciences at the University of Florida, collaborator on the Perseverance rover science team, astrobiology researcher at Blue Marble Space Institute of Science

**Advice to Students:** Find what you love and be persistent about achieving that goal!



**PETER HENSON**

**NDSGC Involvement:** NASA Intern

**Education:** North Dakota State University, B.S. in Civil & Environmental Engineering, University of North Dakota, M.S. in Space Studies

**Where are you now?** Staff Engineer- civil engineering firm (Interstate Engineering, Inc.)

**Advice to Students:** Find things you enjoy, surround yourself with people who share those interests, and get involved. Be a team player, take care of yourself and those around you (both inside and outside of school & work), do the right thing, and strive for excellence. There will be tough times in your career – keep persevering. Respect your elders and be quick to listen, slow to respond. Make S.M.A.R.T. goals, be prepared, be bold, be strong, do your best, have a positive attitude, and follow your heart.

CONTINUED ON PG. 43

# STUDENT Travel Grants

The NDSGC provides travel grants to students at affiliate schools who will present papers or posters at conferences throughout the U.S. By attending these conferences, students are given the opportunity to share their research and network with others in the STEM community. For the Fall 2020, Spring 2021, and Summer 2021 semesters, NDSGC funded students attended online conferences.

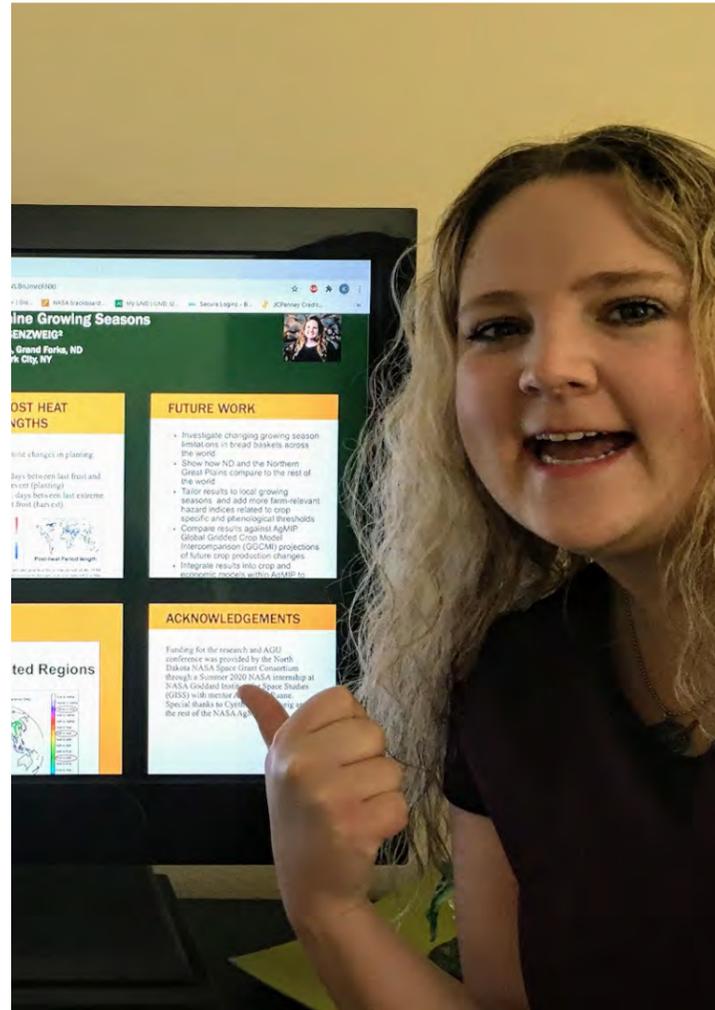
# Mini Grants

## STUDENT MINI GRANTS

Student mini-grants are available for undergraduate and graduate students who are completing STEM- or NASA-relevant research that directly affects their thesis or dissertation (or a similar culminating project that enables students to graduate). Student mini-grants are awarded each semester and may include materials funding.



**STEVEN RUSSELL**  
Spring 2021 | University of North Dakota  
Space Studies Graduate Program  
**Lunar and Planetary Science Conference (Virtual)**



**KAELA LUCKE**  
Fall 2020 | University of North Dakota  
Atmospheric Sciences Graduate Program  
**American Geophysical Union (Virtual)**



**TERRY RECTOR**  
Fall 2020 | University of North Dakota  
Aerospace Science Graduate Program  
**Mission Management Computer System**



**LORI WATERS**  
Fall 2020 | University of North Dakota  
Space Studies Graduate Program  
**ExoLab Supplies**



**STEVEN RUSSELL**  
Fall 2020 | University of North Dakota  
Space Studies Graduate Program  
**Asteroid Regolith**  
“The NDSGC enabled me to complete a project that connected my two research passions of space and biology. They were an invaluable resource for me to get the support I needed to accomplish my goals and earn my degree!”

## EDUCATOR MINI-GRANTS

Educator Mini-Grants are open to North Dakota K-12 and informal educators who are teaching, hosting, or participating in research or education initiatives related to STEM and/or NASA. Mini-Grants may be applied to, but are not limited to: STEM-relevant field trips, materials and resources that enhance the STEM classroom, and participation in NASA-relevant or STEM challenges at local, regional, and national levels.



### LAURA MUNSKI

Fall 2020 | Dakota Science Center

#### Planet Distance Exhibit

"The upgrade to the Planet Distance outdoor exhibit has made the educational exhibit available to the public year-round. Families enjoyed walking the solar system at our December Winter Science event."



### ASHLEY MESSNER

Spring 2021 | Wachter Middle School

#### Modular Robotics Cubelets

"NDSGC has been great to work with for obtaining grants and providing my students with an experience in the classroom."

*Pictured: Ashley Messner's 7th grade students with their Cubelets.*



### RHONDA KUNTZ

Spring 2021 | Richardton-Taylor Public School

#### MakerBot 3D Printer

"This mini-grant has allowed me to offer more STEM classes with a variety of subjects and also enhance my current core classes with hands-on knowledge and experience."

## AFFILIATE MINI-GRANTS

Affiliate Mini-Grants are available to NDSGC affiliate representatives who are hosting or participating in research or education events related to STEM and/or NASA. Affiliate Mini-Grants may also be applied towards college-level initiatives, such as materials funding for STEM courses and research, or travel funding for college students to participate in field research related to their STEM courses. Faculty must be directly involved in the programming to be eligible for a Mini-Grant.



#### STEM CAMP

Vivian Backer, 12, left, and Kole Albers, 13, work together on a MARS Thermos activity on Wednesday at a Gateway to Science Middle School STEM Camp. The activity involved thermal regulation by monitoring temperatures of hot and cold liquids and a control liquid. "We're trying to keep the water the same temperature for ten minutes," Albers said. Gateway to Science Programs Director Janet Rosario said the weeklong camp involves the North Dakota Space Grant Consortium. "And basically all the activities are NASA activities, and they use all their STEM skills in these activities," she said.

### JANET ROSARIO

Summer 2021 | Programs Director, Gateway to Science

#### Engineering Space Settlements Summer Camp

"The camp was designed to both educate and inspire students through a series of engineering activities and astronaut training experiences that a real astronaut might face. The activities focused on STEM skills, the engineering design process, teamwork, and leadership."



### TOM GONNELLA

Fall 2020 | Mayville State University

#### Bringing Back Rocketry



### DAVID DEMUTH

Fall 2020 | Valley City State University

#### Viewing the Universe Using a Celestron Telescope

## SPHERO MINI-GRANTS



In Fall of 2020, the following educators competitively applied for and received a classroom set of Sphero Robots, after completing a 15-hour professional development workshop earlier that summer.

Nancy Coleman

Jana BlueArm

Brenda Rhone

Carrie Reimche

Harmony Richman

Janelle Green

Jennifer Hayes

Katy Ramey

Laura Hoerner

Lisa Ramey

Nancy Coleman

Melanie Star

Rhonda Kuntz

Kelly Hochhlater

Alexa Azure

Kayla Neshem

Terri Moser

# STEM AMBASSADOR Program

**TO PROMOTE SCIENCE, TECHNOLOGY, ENGINEERING, AND MATH (STEM) ACROSS NORTH DAKOTA, THE NDSGC ESTABLISHED THE STEM AMBASSADOR PROGRAM.**

**AVAILABLE FOR UNDERGRADUATE AND GRADUATE STUDENTS AT ALL NDSGC AFFILIATE SCHOOLS.**

STEM Ambassadors conduct hands-on activities to North Dakota students, families, and communities. This can include K-12 classroom visits and informal education events such as library engagement events, family nights, and science festivals.

## ADDITIONAL STEM AMBASSADORS:

**Alexis Gullet**  
Dakota College in Bottineau | Pre-Physical Therapy

**Taylor Keplin**  
University of North Dakota | Occupational Therapy

**Samantha Rosario**  
Bismarck State College | Agriculture/Crop Science

**Alexis Hess**  
University of North Dakota | Commercial Aviation/UAS

**Kimberlee Blevins**  
Sitting Bull College | Environmental Science



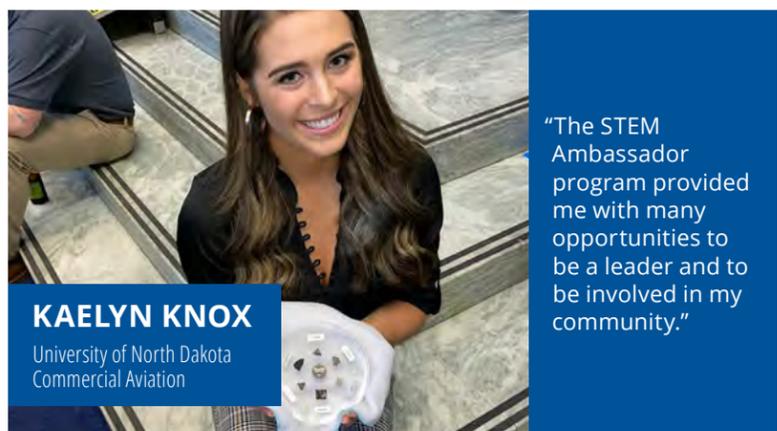
**RYAN KRAM**  
University of North Dakota | Commercial Aviation

"Being a stem ambassador has allowed me to share my love for NASA and STEM careers with the next generation of students during my time in college."



**HOPE BURDOLSKI**  
University of North Dakota | Secondary Science Education

"My time as a STEM Ambassador has been an amazing experience and has allowed me to grow as an educator and grow my passion for serving others in the community. It has been one of my favorite college experiences and has allowed me to grow in every way!"



**KAELYN KNOX**  
University of North Dakota  
Commercial Aviation

"The STEM Ambassador program provided me with many opportunities to be a leader and to be involved in my community."

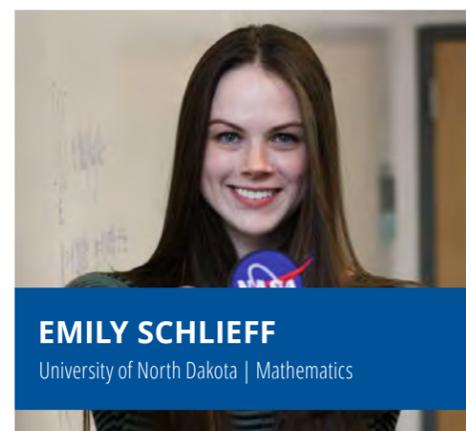


**THOMAS POWER**  
Bismarck State College | Secondary Science Education



**JACQUELYN EMERY**  
University of North Dakota | Commercial Aviation

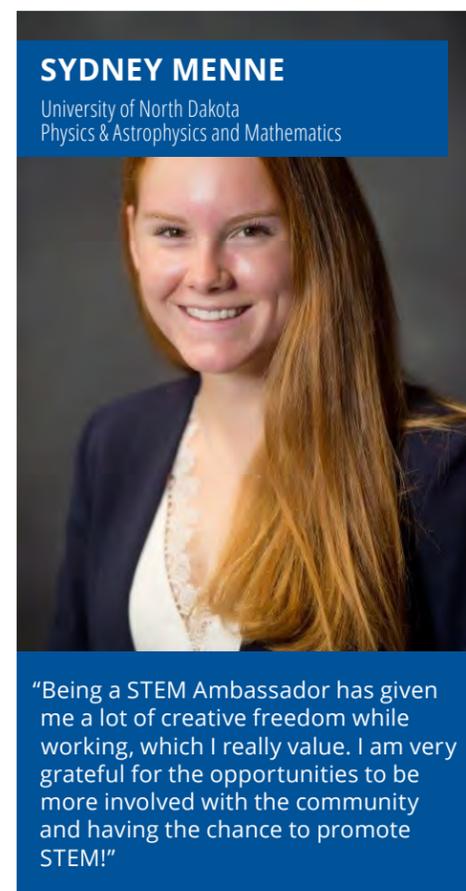
"Working as a STEM Ambassador has been an amazing experience! I love being able to share my STEM knowledge with others and inspire the future generation of STEM leaders. Plus, who doesn't love space?!"



**EMILY SCHLIEFF**  
University of North Dakota | Mathematics

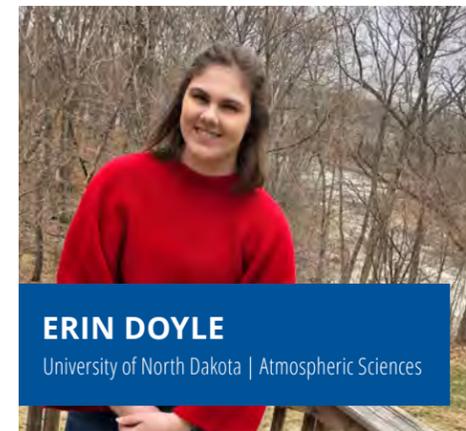


**DANNY ERDMANN**  
University of North Dakota | Commercial Aviation

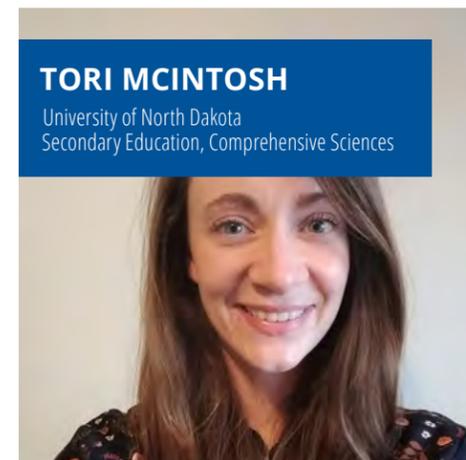


**SYDNEY MENNE**  
University of North Dakota  
Physics & Astrophysics and Mathematics

"Being a STEM Ambassador has given me a lot of creative freedom while working, which I really value. I am very grateful for the opportunities to be more involved with the community and having the chance to promote STEM!"



**ERIN DOYLE**  
University of North Dakota | Atmospheric Sciences



**TORI MCINTOSH**  
University of North Dakota  
Secondary Education, Comprehensive Sciences



**MICHAELA NEAL**  
University of North Dakota  
Environmental Studies

"Being a STEM Ambassador has opened my mind to so many possibilities for interactive educational experiences that will enable students statewide to access relevant NASA resources with a click of a mouse. By integrating these resources with virtual reality headsets, I feel as though I am glimpsing the future!"



The STEM Ambassador of the Year is awarded each spring to a STEM Ambassador that has made a lasting impact on the program through high performance and outstanding achievements. Each student awarded STEM Ambassador of the Year receives a \$250 scholarship.

STEM AMBASSADOR  
OF THE YEAR

# ERIN DOYLE

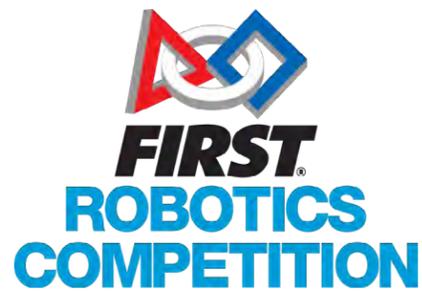
2021

**“In May of 2021, I graduate from UND with a Bachelor of Science in Atmospheric Sciences and Honors, with minors in Mathematics and Sustainability studies. Post-graduation I plan to attend law school with a focus on environmental law. It is my hope that I will be able to bring my science background to the policy that surrounds our environment and natural resource use.**

**I have worked as a STEM Ambassador with the NDSGC for two academic years and am very sad to be leaving them once I graduate. I have also received NDSGC funding for a NASA internship in the summer of 2021. I am very grateful for all the support the Space Grant has given me over the last few years!”**

**-Erin Doyle, April 2021**

**UPDATE** Since May of 2021, Erin completed a NASA internship at NASA Headquarters, earned a byline on the front page of a NASA newsletter, and had a successful first semester of law school in Portland, Oregon.



The FIRST (For Inspiration and Recognition of Science and Technology) Robotics Competition promotes inclusivity and hopes to inspire students to engage in STEM activities in order to become future STEM leaders.

All students, whether they possess technical or non-technical skills, are encouraged to be part of these competition teams. The FIRST Robotics Competitions combine STEM and sports. Past regional qualification rounds have put robots to the test of playing basketball! The North Dakota Space Grant Consortium is thrilled to fund FIRST Robotics Teams across the state of North Dakota. In the past, North Dakota teams have even advanced to the FIRST Robotics World Championships.

# FIRST Robotics

## NORTH STAR (CANDO) FIRST ROBOTICS: TEAM # 877

"North Star FIRST Robotics Team 877 was fortunate to have the opportunity to meet together, face-to-face during our build season this year, with appropriate precautions for COVID-19, alongside our normal shop safety protocols. Although our competition was virtual, it didn't stop the team from learning new skills, refining existing ones and having a great time building a completely new robot. New members learned all the basics of assembling a robot chassis, wiring the control system and, of course, driving!

The team invested in new robot parts, a resin 3D printer and will be adding a benchtop metal lathe this summer. Without the ongoing support from the NASA North Dakota Space Consortium, our team would be missing out on all the important STEM, leadership and communication skills that are part of FIRST Robotics. Thank you so much for investing in our future engineers, scientists, and innovators!"

- Lisa Ramey, 2021 North Star (Cando) FIRST Robotics Mentor and Team Lead

## HATTON-NORTHWOOD FIRST ROBOTICS: TEAM #876 (THUNDER ROBOTICS)

"The Thunder Robotics team had a strange but very successful season. Team 876 re-designed their 2020 robot for a "virtual competition" in which the

students needed to use all their skills. The programmers got the robot to autonomously compete in two events while the drivers worked hard to compete in four different events. Some of the students designed an entire new game for future competition and were judged via video conferencing, while others prepared speeches and presentations for the Chairman's Award, which is the ultimate prize for a FIRST robotics team. We attended one competition, the NMRC Invitational at Bemidji.

Our NDSGC grant allowed our team to learn by designing and building our robot 'Scorpion'. Our goals and horizons were expanded to new levels as the students competed against similar teams from a wide area."

- Mike Voglewede, 2021 Hatton-Northwood FIRST Robotics Mentor and Team Lead

## GRAND FORKS FIRST ROBOTICS: TEAM #8188

"Participating in the FIRST Robotics Competition this year has allowed us all to continue to learn valuable skills, such as programming, CAD, designing, and fabrication. This will help us all figure out what we want to do in the future and give us the skills to succeed.

Having the support of the ND Space Grant Program has been amazing in helping us learn new things while participating in robotics. The parts and tools we were able to get thanks to the Space Grant were extremely helpful this year and allowed

me to learn new ways of making parts for our robot."

- Sarah Dignan, 2021 Grand Forks FIRST Robotics Mentor and Team Lead

## JAMESTOWN FIRST ROBOTICS: TEAM # 7578

The Quantum Misfits, FIRST Robotics Team 7578 entered its third season in 2021 and it's first as a co-op team.

The NDSGC was excited to have the Jamestown FIRST Robotics Team present at the 2021 Student Symposium, thank you!

## ROLLA FIRST ROBOTICS: TEAM #8255

The Rolla Robodogs team consists of 9th-12th grade students. In 2020, the Robodogs were the highest seeded rookie team at the Great Northern Regional in Grand Forks!

"First Robotics opens doors for our students they would never has a chance for without."

- Brad Nash, 2021 Rolla FIRST Robotics Mentor and Team Lead



HATTON-NORTHWOOD FIRST ROBOTICS: TEAM #876



ROLLA FIRST ROBOTICS: TEAM #8255



JAMESTOWN FIRST ROBOTICS: TEAM # 7578



NORTH STAR (CANDO): TEAM # 877

Top Left: The Hatton-Northwood robot.

Top Right: Brad Nash, Wyatt Dunlop and Adam Gottbreht.

Bottom Left: The Jamestown FIRST Robotics robot.

Bottom Right: Student Comi working on part of the team robot.



The North Dakota Space Grant Consortium has abided by all COVID-19 rules and regulations for their programming since the start of the pandemic. The North Dakota Space Grant Consortium will continue to adhere to the standards set by the University of North Dakota and NASA to ensure the safety of their community.

# COMMUNITY Engagement Events

## VIRTUAL 5K

In the Spring of 2021, the NDSGC hosted a Virtual 5k event to celebrate their 30th birthday. Participants had 15 days to complete their 5k in whichever way suited them best. People participated from near and far: CA, FL, VA, and across ND. There were teams, families, and solo participants. Some of those that registered walked and ran while others surf skateboarded or completed their 5k challenge on a bicycle. All participants received a virtual race bib and those based in North Dakota received a 3D-printed medal, posters, and stickers.

arrived at the State Historic Site and sat together while they watched the meteors pass overhead in the dark sky. Caitlin and Sydney were on hand to answer any questions those that attended had and handed out brochures that included fun facts on meteor showers.

## FARGO AIRSHO AND STEM EXPO

NDSGC Coordinator Tori McIntosh, and STEM Ambassadors Daniel Erdmann and Sydney Menne were invited to join the STEM Alliance as part of the STEM Expo at the Fargo AirSho on July 24th, 2021. The NDSGC team brought virtual reality headsets for the everyone at the AirSho to try. The NDSGC was excited to share a STEM Expo tent with the North Dakota FIRST Robotics booth!

## LOGO REDESIGN CONTEST

In October of 2020, the NDSGC sent a call to all K-12 and college students for help in designing a new logo. We received six entries from across the state. Prizes included a Sphero Mini and a virtual classroom visit with a Crew Systems Trainer from NASA's Johnson Space Center. The NDSGC thanks all those that participated, and the STEM Ambassadors that managed the contest.

*See the logo entries on the next page!*

## MDU STEM EXPO

In August of 2021 STEM Ambassadors Hope Burdolski and Thomas Power led a stomp rockets activity and handed out NASA posters and stickers at the MDU Resources STEM Expo. This community science fair was held at the Bismarck Municipal Ballpark in Bismarck, ND.

## MINUTEMEN PERSEID PARTY

On August 11th, 2021 NDSGC Director Caitlin Milera and STEM Ambassador Sydney Menne attended the Ronald Reagan Minuteman Missile State Historic Site Perseid Party. This meteor shower viewing party started around 11 pm and went late into the night. Families



Above: The social media post from NDSGC's Virtual 5k.

Top Left: STEM Ambassadors Sydney Menne and Daniel Erdmann, and NDSGC Coordinator Tori McIntosh hosting their booth at the Fargo Air Show and STEM expo.

Top Right: NDSGC Director Caitlin Milera and NDSGC STEM Ambassador Sydney Menne attend the Minutemen Perseid Party.

Bottom Left: NDSGC STEM Ambassadors Hope Burdolski and Thomas Power attend the MDU STEM Expo.

Bottom Right: NDSGC awardee, Kaela Luck participated in the Virtual 5k; NDSGC 5K bib.

# LOGO REDESIGN CONTEST ENTRIES

OCTOBER 2020



Submission from Missouri Ridge School in Williston, ND.

**Most Creative**

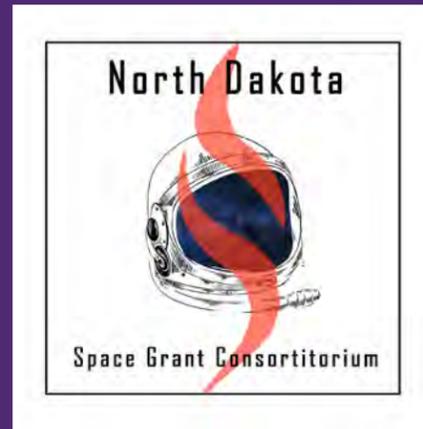
The NDSGC appreciated this hand-drawn entry and the use of color from the artist.



Submission from the University of North Dakota in Grand Forks, ND.

**The NDSGC decided to adapt this logo into a new logo for the STEM Ambassador program!**

The artist included an array of STEM subjects in this design.



Submission from Napoleon School in Napoleon, ND.

**High School Category Winner**

This artist incorporated part of our original logo into the design.



Submission from Ben Franklin Junior High in Fargo, ND.

**Middle School Category Winner**

The graphics in this entry encapsulated North Dakota, space, orbits, and farming.



Submission from Ben Franklin Junior High in Fargo, ND.

**Local Pride Award Winner**

This design recognizes the connection between farming in ND and NASA.



Submission from the University of North Dakota in Grand Forks, ND.

**Grand Prize Winner!\***

Each star on the map of North Dakota represents one of NDSGC's 18 affiliates.

*\*Unfortunately, the NDSGC was unable to adopt the winning logo as their official logo due to NASA rules and regulations.*

## SPACE EXPLORATION Educators Conference

SEEC: FEBRUARY 2021

Through a competitive application process, the NDSGC awarded United Tribes Technical College instructor Kelly Rexine and his class of education students funding to virtually attend the 2021 Space Exploration Educators Conference (SEEC).

Traditionally hosted at the Space Center Houston in Texas, this professional development conference allows pre- and in-service educators the chance to network with other educational professionals and learn about hands-on STEM activities they can conduct in their classrooms. Keynote speakers for the 2021 conference included NASA Astronaut Kjell Lindgren, and James Webb Telescope Project Manager and Physics Nobel Prize winner Dr. John Mather. STEM activities shared included rocket chemistry, Lego engineering, and a crest-cutting demonstration provided by an educator from Japan.

NDSGC Deputy Director, Marissa Saad, NDSGC Coordinator, Tori McIntosh, and three NDSGC educator affiliates also attended the conference online.

Right Top: Space Exploration Educators Conference logo.

Right Bottom: NASA Astronaut Kjell Lindgren speaking at the 2021 Space Exploration Educators Conference.



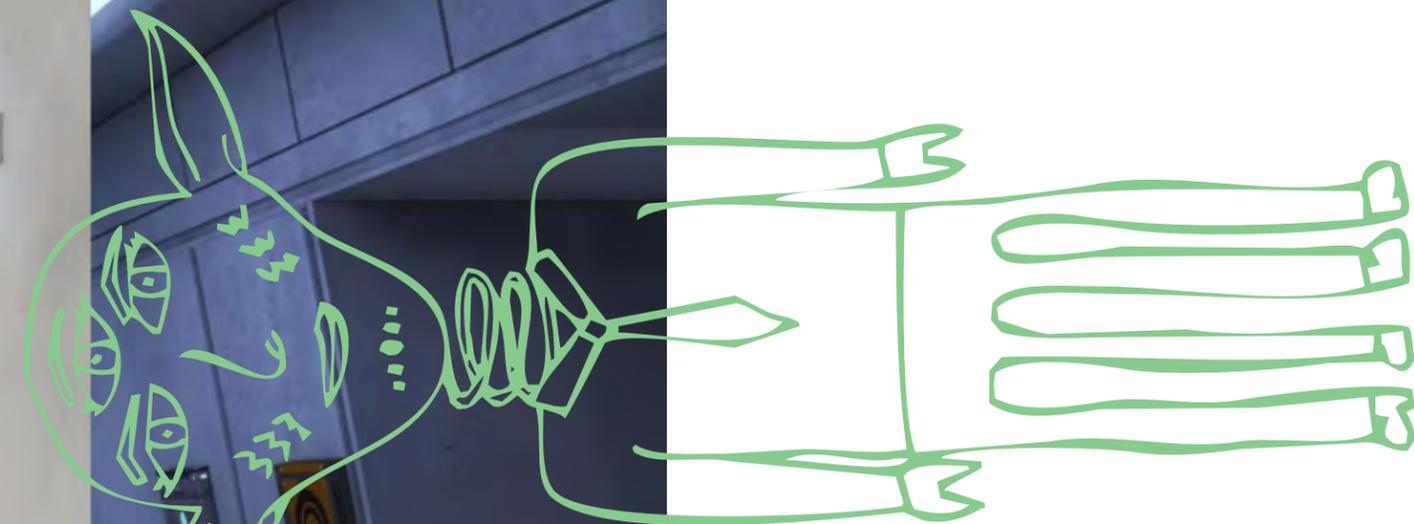
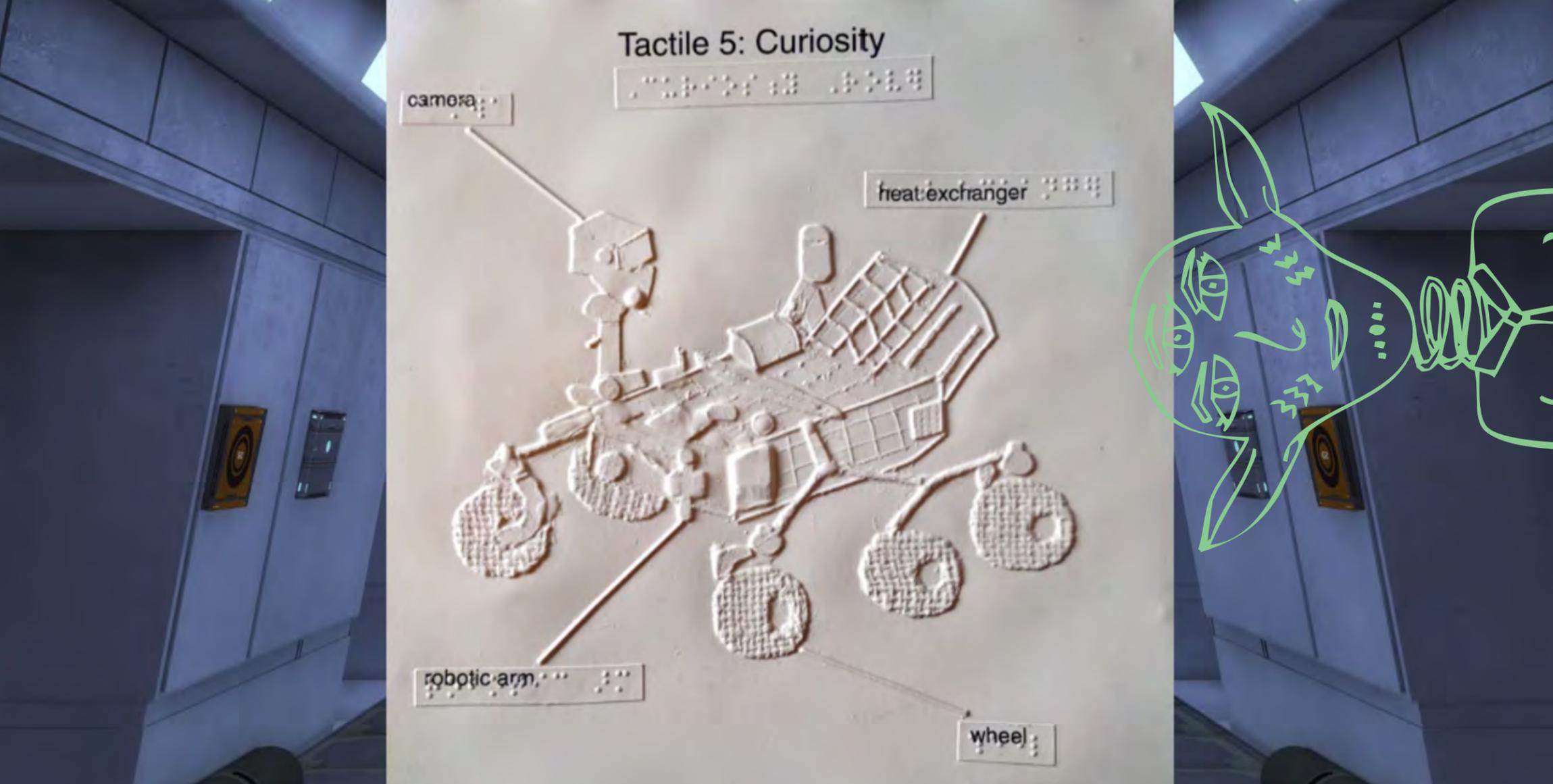
NASA astronaut [@astro\\_kjell](#) is opening [#SEEC2021](#) with an inspiring keynote presentation this morning. Dr. Lindgren flew on Expedition 44/45 & logged 141 days in space. He participated in 2 spacewalks & in more than a hundred different scientific experiments.



8:33 AM · Feb 4, 2021 · Twitter Web App

3 Retweets 1 Quote Tweet 18 Likes





# NDVS/SB

## ESCAPE ROOM

In 2021, the NDSGC created and facilitated a virtual escape room activity for NDVS/SB students. This virtual activity was based on a space vacation gone awry. Students had fun as they navigated Mars, escaped a meteor shower, flew a spaceship, and discovered a new alien. Breakout rooms with trivia, tactile books, and a build-an-alien activity were all part of the adventure. Two escape rooms were hosted and the NDSGC hopes to conduct more in the future.

The NDSGC team even went on to present about the organization and facilitation of their virtual escape rooms to educators at the North Dakota Center for Persons with Disabilities, discussing potential future collaborations.

## SCHOLARSHIP

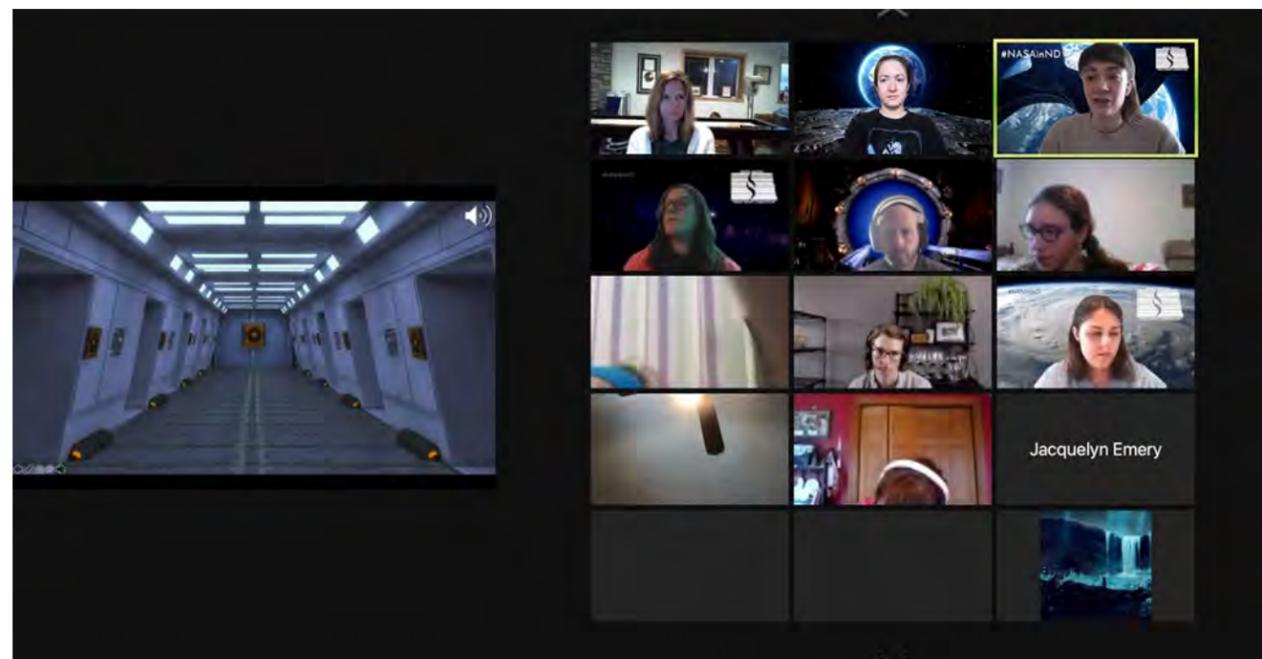
The NDSGC, through a partnership with NDVS/SB, awards annual NDVS/SB scholarships. Up to five scholarships from a collective total of \$2,500 are awarded. The NDSGC attended the first annual NDVS/SB and NDSGC Scholarship ceremony in 2021. The two awardees, Menuka Rai and Dietrick Schlichtmann were present along with their family members, NDVS/SB faculty and staff, and the NDSGC Deputy Director and Coordinator.

[Learn more about the scholarship winners on page 22!](#)

*Top: A page from the SSERVI braille book focusing on the Mars Exploration Program. Books were supplied by the South Carolina Space Grant.*

*Bottom Left (from L to R): NDSGC Coordinator, Tori McIntosh, Scholarship Winner Dietrick Schlichtmann, NDVS/SB Faculty Cindy Williams, Scholarship Winner Menuka Rai, and NDSGC Deputy Director Marissa Saad.*

*Bottom right: Students explore a space ship as part of the escape room activity.*



 **CHECK OUT THE PURPLEAIR MAP WITH NEWLY POPULATED ND DATA POINTS!**  
[tinyurl.com/37w9jbab](https://tinyurl.com/37w9jbab)

# EDUCATOR PROFESSIONAL Development

## IDEAS

IDEAS, or Innovative Differentiated Exploration Activities in Space Science, is a collaborative effort between the North Dakota, North Carolina, South Carolina Space Grant Consortia, and NASA, all of whom have the common goal of providing inclusive and accessible best practices and adaptations for existing NASA lesson plans.

The IDEAS program is a spin-off of a series of workshops that occurred over seven years where NASA scientists and engineers, formal and informal educators, and students gathered to conduct hands-on STEM activities to help identify what needed to be excluded, adapted, or enhanced with the concept of Universal Design in mind.

In 2021, the IDEAS team started working with NASA Langley's Office of STEM Engagement to record footage of their

## IMPACTING STUDENTS AND CLASSROOMS: LISA RAMEY, CANDU, ND EDUCATOR

NASA-in-the-Classroom workshops impact both educators and their students. Educator Lisa Ramey, from Cando, ND attended the 2020 Sphero Robot workshop. Lisa's sixth grade students at North Star used Sphero robots to learn about loops and conditional code, and created a hot potato game that incorporated animal sounds. Lisa's students also had fun designing obstacle courses, complete with ramps, for their Sphero robots on "Sphero Fun Day"

suggested adaptations. In the Summer of 2021, the North Dakota Space Grant Consortium was joined in the recording studio by both the North Carolina and the South Carolina Space Grant Consortia at NASA Langley. Videos should be available in 2022.

## PURPLEAIR SENSOR WORKSHOP

The NDSGC hosts a NASA-themed workshop each year for North Dakota educators. Pre- and in-service teachers can register for professional development credits and/or continuing education credits. Past workshops have implemented Sphero Robots, PurpleAir Sensors, and NASA education standards and content.

These "NASA-in-the-Classroom" workshops allow educators to receive hands-on experience and integrate these project-based learning activities into their

own classrooms. Workshops are open to all North Dakota pre- and in-service educators and are free to attend.

In August of 2021, the NDSGC hosted a virtual workshop titled "North Dakota Atmospheric Investigations." Twenty educators spent 15 hours studying atmospheric teaching resources (PurpleAir sensors, Aerosol Watch, Fire and Smoke maps, wind data, etc.). All teachers received a free PurpleAir sensor, interviewed 4 NASA scientists, learned about citizen science, planetary atmospheres, and networked with other ND educators.

"The opportunities and resources that the NDSGC provides educators with are real STEM-based materials that are easy to implement and get students excited about."  
 —Emma Rage, Kensal Public School educator and 2021 PurpleAir Educator Workshop participant



Top Row Left: Educators interacting with Dr. Kristina Pistone from NASA Ames as she discusses aerosols and the atmosphere.

Top Row Right: An educator's PurpleAir Sensor, mounted to the outside of their school.

Center Row Left: Team mascot from North Star schools

Center Row Right: NDSGC Coordinator, Tori McIntosh in the studio at NASA Langley.

Bottom Row Left: NDSGC Director, Caitlin Milera in the studio and NASA Langley.

Bottom Row Right: The North Dakota, South Carolina, and North Carolina Space Grants pose with the NASA Langley Educational Media Team.

MEET AN AFFILIATE:

# North Dakota's Gateway to Science

**"SEEING A CHILD'S FACE LIGHT UP WHEN THEY DISCOVER SOMETHING NEW NEVER GETS OLD," NOTES BETH DEMKE, EXECUTIVE DIRECTOR OF NORTH DAKOTA'S GATEWAY TO SCIENCE.**

"We often see this light in the children that visit our hands-on gallery or participate in our programming. It's the spark that gives them confidence to try new ideas, and inspires them to more discovery."

Demke has been a part of North Dakota's Gateway to Science (NDGTS) since it was founded in 1994 and located in Bismarck's Gateway Mall. Ten years later, the hands-on science center moved to space in the Tom & Frances Leach High Prairie Arts & Science Complex where you'll find it today. Its remaining time there is limited, however, as NDGTS is building for the future.

A construction project on the Bismarck State College campus will greatly expand this valued resource to better serve the students and families in our state. Scheduled for completion in 2022, this new facility will feature interactive experiences that highlight STEM industries, careers, and skills.

"In North Dakota, we start our kids in hockey, soccer and gymnastics in preschool. Shouldn't we do the same for future engineers, nurses, and mechanics?" Demke asks.

The current facility includes 2,500 square feet of exhibit area, no classrooms, and limited capabilities. The new science center will have 13,700 square feet of gallery space, or 5½ times more room for exhibits. "Our interactive gallery will tell the story of innovation and opportunity in North Dakota with exhibits on agriculture, energy, healthcare, transportation and



The NDGTS staff take a photo at the building site in December of 2021

Left to right: Zak Allen, Assistant Director; MeriCarol Storhaug, Administrative Assistant; Judy Sauter, Marketing Director; Kim Eslinger, Gallery & Exhibits Director; Brooke Kemmet, Gallery Assistant; Beth Demke, Executive Director; Lesley Icenogle, Development Director; Janet Rosario, Programs Director

more," Demke explains. "North Dakota's Gateway to Science is a place where families have fun together. They're learning and may not even realize it."

The facility will also feature an education wing including a laboratory classroom, two additional classrooms, and outdoor learning areas. The expanded space means expanded programs offered by NDGTS - including camps, after-school clubs, workshops, and public events - will reach more children and families.

In addition to expanding its current programming, the science center will host labs, workshops, and professional development opportunities for educators. The new center will also serve as the headquarters for Gateway to Science on the Go, a statewide STEM outreach program.

NDGTS has a significant record of direct service in promoting and delivering STEM activities throughout North Dakota. In

the past three years, science center staff have provided hands-on STEM learning experiences at more than 100 community sites through Gateway to Science on the Go. Learning experiences take the form of in-class, interactive STEM workshops, STEM festivals with facilitated activity stations during the school day for students, and out-of-school-time STEM festivals for students and families.

In 2021, the science center announced a name change to North Dakota's Gateway to Science. The Board of Directors made this change in recognition of the support received from the State of North Dakota and from individuals and businesses throughout the state.

"Updating our name to include North Dakota reflects the statewide nature of our mission and impact," Demke explained.

"Our interactive gallery is located in Bismarck, where we host visitors from all across the state. We also serve students and families through our mobile program that brings our unique, hands-on STEM

programming to North Dakota schools and communities."

A core value of North Dakota's Gateway to Science is accessibility and affordability for all. "We believe STEM skills like critical thinking and creative problem solving empower people of all ages, backgrounds, and perspectives," Demke said.

### NDGTS OFFERS:

- Discounted admission for at-risk youth and adults through agency admission program and for families receiving food assistance through Museums for All
- Scholarships for students to attend after-school and summer clubs and camps
- Free Family days with activities for all ages
- STEM at Home web page with experiments and resources for families and educators

"Our mission is to inspire the scientist in everyone," says Demke. "We engage and empower children and families to spark their passion with hands-on exhibits and programs. And we have fun doing it!"



Rendering of the new building's front entrance.

## WHERE ARE THEY NOW? CONT.

FROM PG. 23



### DYLAN YOUNG

**NDSGC Involvement:** Fellowship Recipient

**Education:** University of North Dakota, B.S./M.S. in Geology

**Where are you now?** Physical Scientist at the Naval Oceanographic Office, Stennis Space Center; Part-time Adjunct Faculty at the University of Southern Mississippi

**Advice to Students:** The world has endless opportunities, but many times, YOU need to be the one to find them and to reach out. Be willing to adapt, to keep moving forward, to communicate and connect with others, to volunteer and to give back to your community. Sometimes, after we reevaluate our challenges, we can even find inspiration in ourselves, and share it with others.



### JAMES STOFFEL

**NDSGC Involvement:** Fellowship Recipient

**Education:** University of North Dakota, M.S. in Space Studies

**Where are you now?** NASA, Johnson Space Center, Deputy Space Suit Exploration & Operations Technical Area Lead: Extravehicular Activity (EVA) Human Performance & Analog Engineer

**Advice to Students:** Earth is a complex dynamic fascinating world of infinite possibilities. Continue to be dreamers and doers, never give up, and do these great endeavors off the Earth, for the Earth, and beyond! Remember it's okay to fail, just as long as you get back up and never give up. Eventually, you'll have covered every possibility and you will become the subject matter expert.

#DreamersDoers #NeverGiveUp

Students and affiliates are encouraged to submit additional Student Success Stories to NDSGC Coordinator, Tori McIntosh (tori.mcintosh@und.edu).

# WE ARE #NASAINND

#NASAINND allows North Dakota students, faculty, and community members to share STEM and NASA involvement on social media. Take a look at all the activities and hard work from the past year!

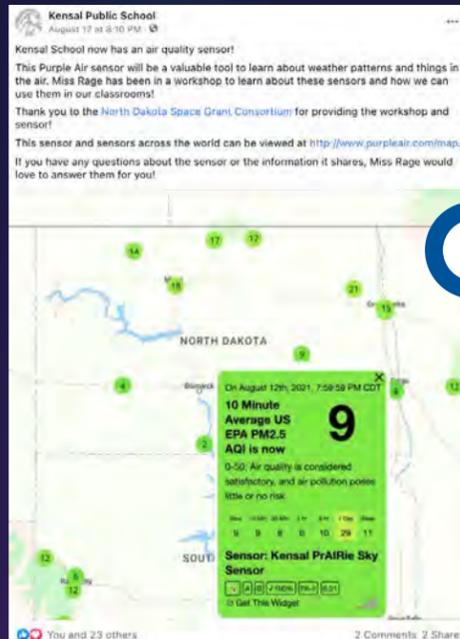
The NDSGC was part of the STEM Expo at the Fargo AirSho in July. The NDSGC hosted a VR headset booth. The NDSGC was excited to have a booth near the FIRST Robotics teams!  
@FargoAirSho @NDSGC @STEMExpo @FIRSTRobotics

UND President Andy Armacost joined the 2021 Student Symposium and Affiliates Meeting. The 2021 Student Symposium and Affiliates Meeting took place online.  
@NDSGC @NASA

LOOK AT THIS LIL' CUTIE! Our coordinator, Tori, has had some luck- her seed from The Space Chile Grow a Pepper Plant Challenge sprouted.  
#TheSpaceChileChallenge

The North Dakota Space Grant Consortium's STEM Ambassadors were part of the Space Chile Grow a Pepper Plant Challenge.  
#SpaceChileChallenge #NDSGC

@undaerospace made sure to feature NDSGC Director Caitlin Milera (Nolby) when she was part of the Women in Space panel.  
#girlpower #NASAINND #WomeninSpace

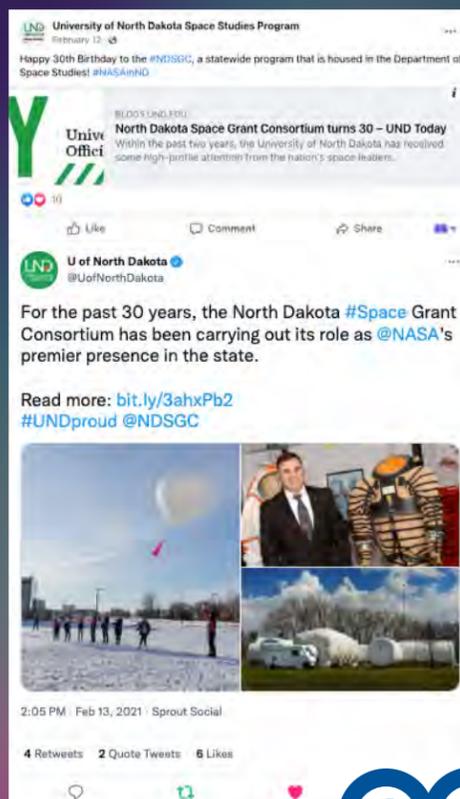


Miss Rage, an educator at Kensal Public Schools, was part of the PurpleAir Teacher Workshop that the NDSGC hosted in August of 2021. The NDSGC hosts teacher workshop development courses each year!

#NDSGC #PurpleAir #STEMEducation

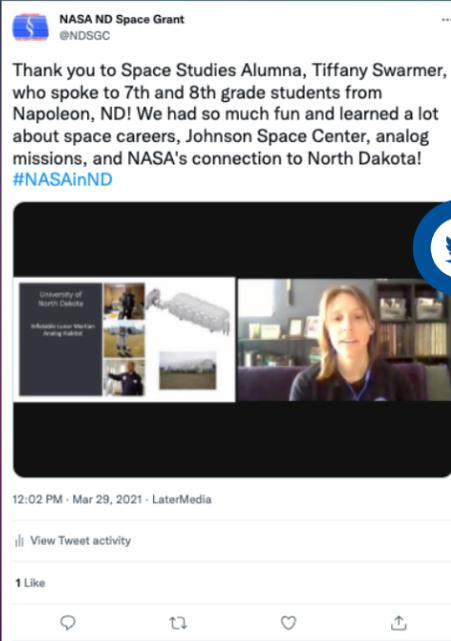
The NDSGC turned 30 in February! Deputy Director Marissa Saad and STEM Ambassadors handed out cupcakes to celebrate.

#HappyBirthday @NDSGC #NASAINND



Many celebrated the NDSGC's 30th birthday, including the University of North Dakota and the Space Studies Department.

#UND #UNDproud #SpaceStudies #NASAINND



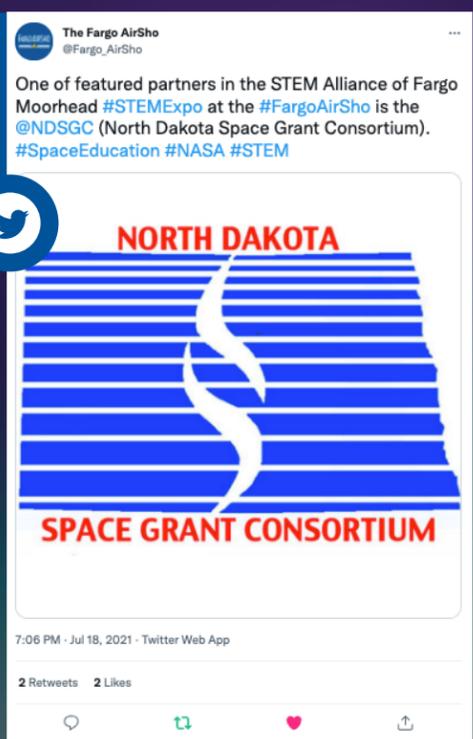
Check out this NASA-themed Valentine's Day box!

@NDSGC @NASA @UNDAerospace

The winner of our NDSGC Logo Redesign Contest choose the prize of having a NASA guest speaker visit their classroom. Thank you, Napoleon School and Tiffany Swarmer!

#NapoleonND #NASAINND

When your 3 year old asks to make an @NASA themed Valentines box, you can't say no! Thank you @NDSGC for the supplies and @SouthMrsG for the crafting skills!  
#UNDproud @NASAArtemis @UNDAerospace



# STAY ENGAGED WITH Space Grant



JOIN OUR MAILING LIST  
tinyurl.com/mpncthaf



VIEW OUR BROCHURE  
tinyurl.com/2p97j4zf



## WE WANT YOU!

The NDSGC is always looking to expand its reach with students and educators across North Dakota.

If you are interested in any of the opportunities described in this newsletter, want to engage your students or colleagues, or want to contact us, please reach out to any member of the NDSGC team. Contact information is listed on the inside of the front cover. You can register for our electronic mailing list and look at our brochure with the QR codes found on this page.

## EDUCATOR WEBSITE

Educator activities can be found on our K-12 Engagement website.

Scan the QR code below to get involved with e-field trips to the Human Spaceflight Lab, to find STEM lesson plans, to request classroom guest speakers, and more!



VISIT OUR  
EDUCATOR WEBSITE

[spacegranteducation.wixsite.com/ndsgc](https://spacegranteducation.wixsite.com/ndsgc)

## WEBSITE AND SUBMITTABLE

To view all of the active NDSGC applications, please visit our Submittable application site.

This list of programs change throughout the year and reflect open application windows. You can find each application form on it's respective web page, within <https://ndspacegrant.und.edu>.



VIEW ACTIVE  
NDSGC APPLICATIONS

[ndspacegrant.submittable.com/submit](https://ndspacegrant.submittable.com/submit)

*We Need You: NASA commissioned poster for an exhibit at the Kennedy Space Center Visitor's Complex in 2009.*

## SOCIAL MEDIA

Stay up to date with North Dakota Space Grant events and happenings by following the North Dakota Space Grant on social media.



@NORTHDAKOTASPACEGRANT



@NDSGC



@NDSPACEGRANT



@NDSPACEGRANT



NORTH DAKOTA SPACE GRANT



NORTH DAKOTA SPACE GRANT CONSORTIUM

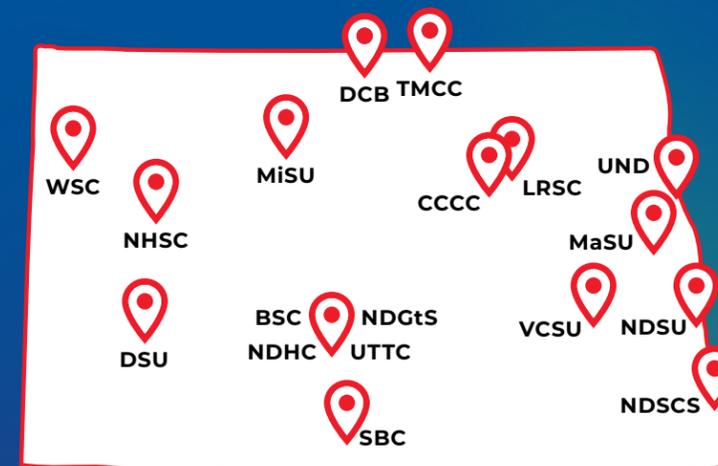


@NDSPACEGRANT



NORTH DAKOTA SPACE GRANT CONSORTIUM

## NORTH DAKOTA SPACE GRANT AFFILIATES



## THANK YOU!

None of these events would be possible without the amazing work of representatives at the NDSGC affiliate institutions (listed on the back cover). Their efforts allow the NDSGC to expand its reach statewide and ensure that students across North Dakota are able to participate in a number of programs. The NDSGC would like to thank each of them for their dedication to NDSGC programming, promotion of opportunities, and continued involvement.

Two essential members of the NDSGC Team retired in 2021. Bev Fetter, Administrative Assistant in the Department of Space Studies, was an absolute asset to the NDSGC team for more than 25 years. Kathy Borgen

served as a Graphic Artist for the NDSGC for 20 years, designing the annual newsletter and other educational materials. Thank you both for your years of service!

Thank you, also, to Heather Schuler (Visual Communications Specialist in the School of Aerospace at the University of North Dakota) for designing the Aurora Newsletter. The NDSGC is grateful for all the work Heather has done and her contributions to the NDSGC.

# WE NEED YOU



# THANK YOU TO OUR AFFILIATES!



**BISMARCK STATE COLLEGE**



**CANKDESKA CIKANA COMMUNITY COLLEGE**



**DAKOTA COLLEGE AT BOTTINEAU**



**DICKINSON STATE UNIVERSITY**

North Dakota's



**ND GATEWAY TO SCIENCE**



**LAKE REGION STATE COLLEGE**



**MAYVILLE STATE UNIVERSITY**



**MINOT STATE UNIVERSITY**



**NORTH DAKOTA STATE COLLEGE OF SCIENCE**



**NORTH DAKOTA STATE UNIVERSITY**



**NUETA HIDATSA SAHNISH COLLEGE**



**SITTING BULL COLLEGE**



**STATE HISTORICAL SOCIETY OF NORTH DAKOTA**



**TURTLE MOUNTAIN COMMUNITY COLLEGE**



**UNITED TRIBES TECHNICAL COLLEGE**



**UNIVERSITY OF NORTH DAKOTA**



**VALLEY CITY STATE UNIVERSITY**

**VALLEY CITY STATE UNIVERSITY**



**WILLISTON STATE COLLEGE**