

VIEW ARCHIVED ISSUES OF
AURORA ONLINE!

ndspacegrant.und.edu/aurora

A photograph of a woman with long blonde hair and three children standing on a grassy field. The woman is in the center, wearing a black polo shirt and jeans. To her left is a girl in a purple hoodie holding a yellow model rocket. To her right is a girl in a white and blue patterned dress holding a brown model rocket. In the foreground, a girl in a teal vest with the number '20310' is kneeling and holding a yellow model rocket. The background shows other people and trees under a clear sky.

NDSGC AURORA

NORTH DAKOTA SPACE GRANT CONSORTIUM | 2024 EDITION



NOTES FROM THE Director

Dear colleagues-

2023 was a year of pretty big changes for the NDSGC Team. In Jan. 2023, the NDSGC welcomed a new Office Manager to the team - Grecia Flaws! Grecia became a master of all things this past year and is the glue that holds this team together! In Feb. 2023, our Coordinator took on a new position outside of the Consortium, gained valuable experience in research and grants, and we are extremely excited to announce her return! Tori McIntosh began in her new role as the Associate Director in August 2023.

After eight years with the ND team, our Deputy Director, Marissa Saad, took on a new position as an Evaluation Specialist with Guardians of Honor in March 2023 and is still involved in the NASA Space Grant world. In Nov. 2023, we welcomed a new Assistant Director, Laurie Salander. Laurie comes to us with significant experience in K-12 education, and active participation in both NASA and NDSGC programming. She has already transformed programs and made positive contributions to the team! While being understaffed made it a challenging year for the NDSGC, we persevered and continued to engage ND students, faculty, and educators in all things NASA and STEM.

In summer 2023, the NDSGC awarded six NASA internships (p. 6), for both in-person and virtual experiences. The NDSGC is proud to support these opportunities, as virtual options for internships invite students to participate who otherwise may not have had the chance. These options also create more equity in opportunities for ND students to build toward a career at NASA, which is one of our overarching goals with Space Grant, connecting students to the NASA and STEM workforce.

In July 2023, the NDSGC partnered with North Carolina and South Carolina Space Grant Consortia, and the Johns Hopkins Applied Physics Laboratory to host another iteration of the IDEAS Educator Professional Development workshop series. These workshops continue to engage teachers in hands-on NASA and STEM lessons focused on designing accessible and equitable activities for all learners. Keep an eye out for the summer 2024 workshop to be hosted by Space Center Houston and NASA's Johnson Space Center!

The NDSGC STEM Ambassador Program (p. 20) continues to grow each year. These students come from various colleges across ND and show true initiative in leading their own K-12 visits and participating in community engagement events (p. 35). They established new partnerships in 2023, and traveled to Western and rural North Dakota to engage with new groups of students and educators.

We are beyond grateful for the strong support of our ND affiliate network, our NASA Space Grant colleagues, and our all-star STEM Ambassadors. Thank you for your collaborations, enthusiasm, patience, and creative ideas throughout the year. We could not have done it without you. Together, we are #NASAINND.

Thank you for your continued support,

Caitlin Milera

Caitlin Milera
Director, NDSGC

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Cover photo: STEM Ambassador Amanda Higginbotham launched rockets with Girl Scouts at an event hosted by UND's Physics Department. Learn more on pg.36!

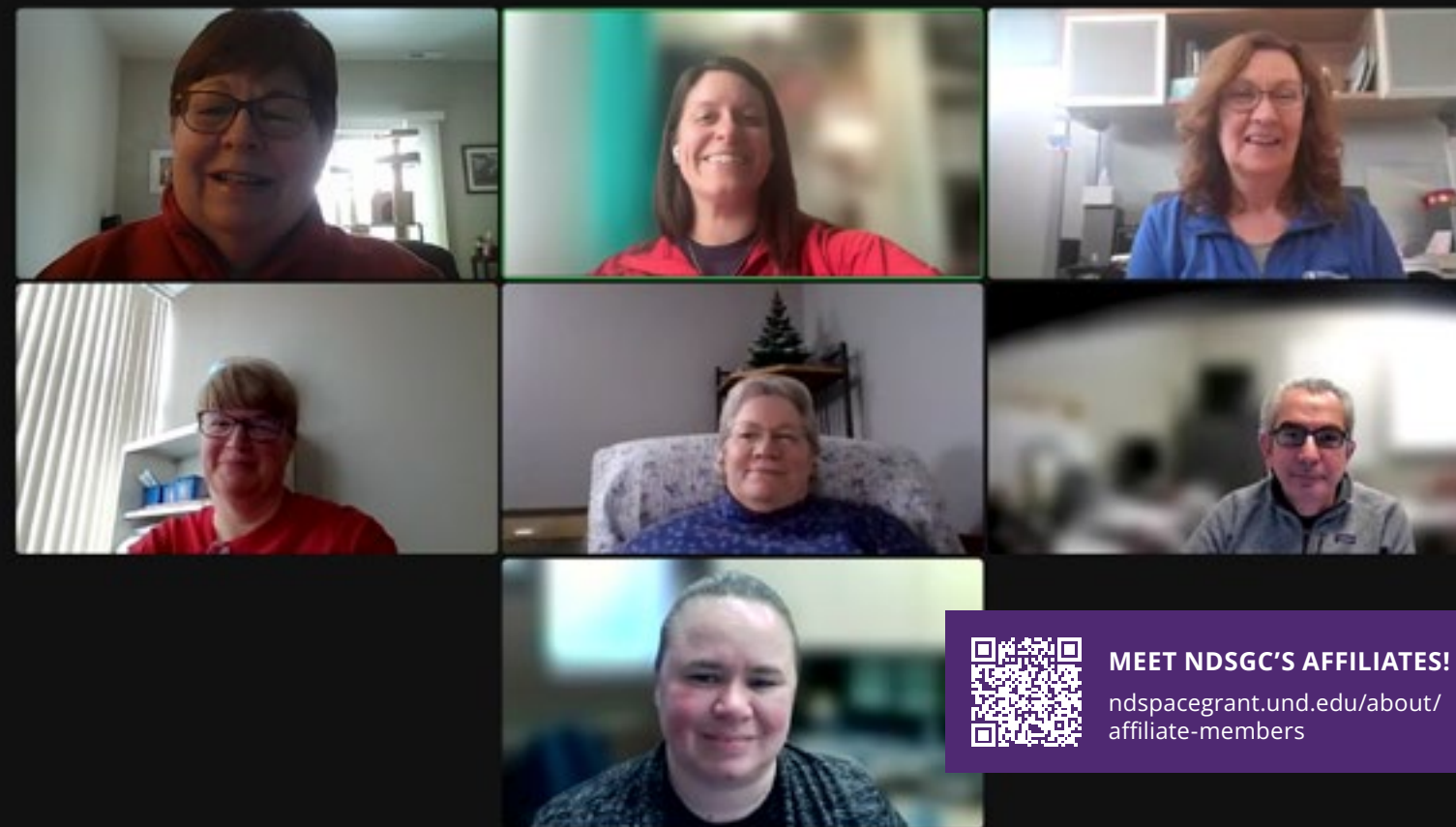
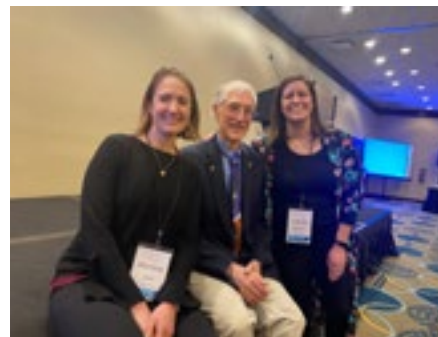
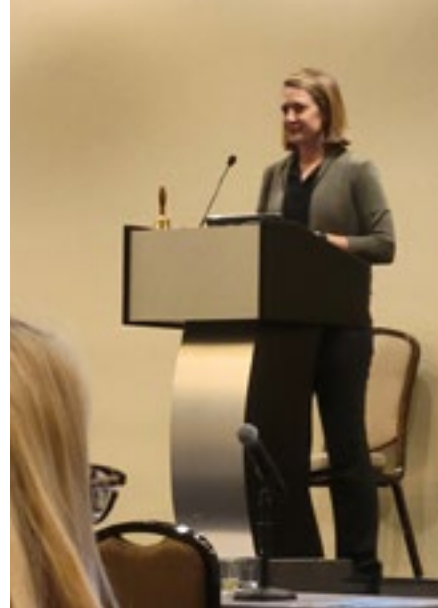


WHAT IS SPACE GRANT?

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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MEET NDSGC'S AFFILIATES!

ndspacegrant.und.edu/about/affiliate-members

Top left: National Space Grant Consortia gather for a group photo at the Texas Regional Meeting.

Top right: Former NDSGC Deputy Director Dr. Saad presenting her research to the National Space Grant Consortia.

Bottom right: NDSGC Director Dr. Milera and former Deputy Director Dr. Saad with Dr. John C. Mather, Nobel Prize Laureate and Senior Project Scientist for the James Webb Telescope!

Top: Affiliates gathered on Zoom to attend the 2023 NDSGC Annual Affiliates Meeting.

SPACE GRANT Meetings

REGIONAL MEETING

In the Fall of 2022, Space Grant Consortia and NASA personnel met in Houston, TX to network, facilitate dialogue on best practices for STEM engagement, and discuss programming that engages historically underrepresented students. NDSGC Coordinator Tori McIntosh and NDSGC STEM Ambassador Jacquelyn Emery presented on the successes of the NDSGC STEM Ambassador Program during the conference.

DC NATIONAL MEETING

The National Space Grant Meeting was held in Washington, D.C. in March 2023. All 52 Space Grant Consortia; one from each state, the District of Columbia and Puerto Rico, gathered to discuss Space Grant's contributions and involvement in STEM through the funding of research, education, and public service projects.

NASA Senior Astrophysicist, Nobel Prize Laureate, and Senior Project Scientist for the James Webb Space Telescope, Dr. John C. Mather, received the 2023 National Space Grant Distinguished Service Award during the meeting.

Past NDSGC Deputy Director, Marissa Saad, presented her dissertation research at the National Meeting, titled, "Space Grant Students' Experiences on Teams," examining different experiences in STEM Teams based on students' genders.

CAPITAL HILL MEETING

In March 2023, the NDSGC Team met with all ND Legislators' staff in a virtual setting. They held three Zoom meetings with U.S. Representative Kelly Armstrong, U.S. Senator Kevin Cramer, and U.S. Senator John Hoeven's offices.

The NDSGC team shared successes of the past year, including NASA-related research and education projects, STEM initiatives, and building the technical workforce of North Dakota through student programming. The NDSGC is grateful for the continued support of Senator Cramer, Senator Hoeven, and Representative Armstrong for the NASA Space Grant program.

AFFILIATE Involvement

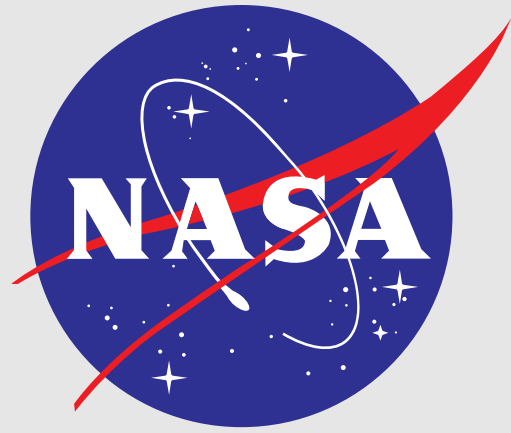
^ SPRING AFFILIATE'S MEETING

The NDSGC held its Annual Affiliates Meeting on April 21, 2023, as a virtual business meeting. Meeting topics included an overview of the NDSGC and NASA Space Grant program at a national level, a review of the previous year's accomplishments and program highlights. The NDSGC also discussed upcoming funding and project opportunities and award processes. The NDSGC is grateful for the continued support of the affiliate network.

COFFEE CHATS >

To continue providing engagement and networking opportunities among affiliates and students, the NDSGC started hosting monthly Coffee Chats. Coffee Chats are a time and place for the NDSGC to touch base with their audience and stakeholders, and for all to share new endeavors, networking opportunities, and successes. Those attending the monthly Coffee Chats and are encouraged to ask questions about NDSGC programming, share upcoming events, and cultivate new connections.





NASA Internships

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

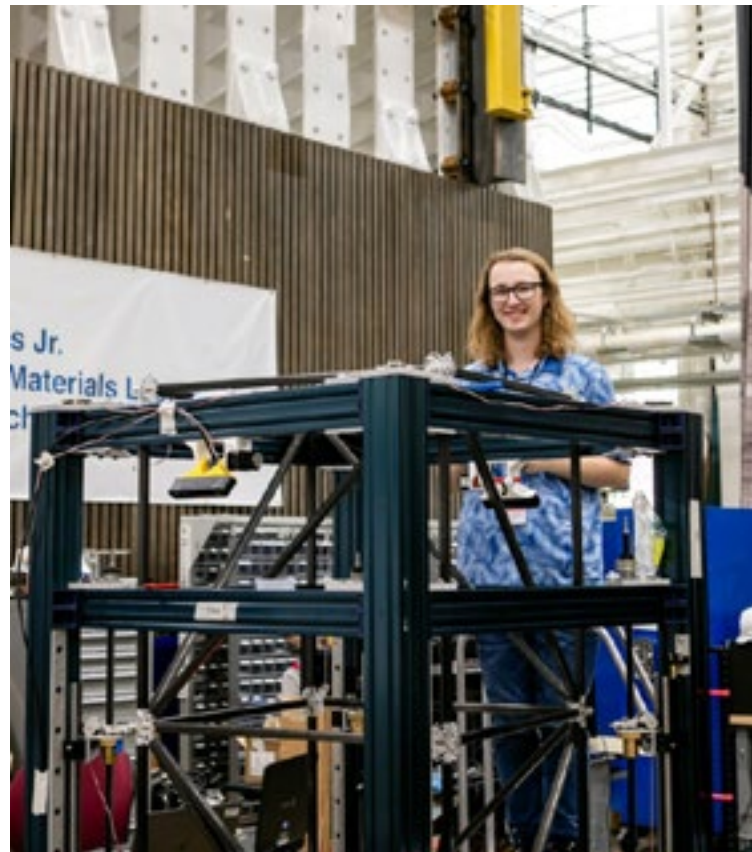
Students who are US citizens and enrolled at NDSGC-affiliated institutions will be able to engage in authentic, hands-on learning experiences that involve real-life problem-solving.



LAINA BEHRENBRIKER

Summer 2023 | University of North Dakota
Internship Location: Ames Research Center

"I am forever grateful for the opportunity to intern at NASA Ames Research Center. The experiences and connections gained throughout this experience led me to grow in confidence as a student and professional in engineering. I gained expertise in subjects I had not previously studied and expanded my existing skill set. This was all possible thanks to support from the North Dakota Space Grant Consortium!"



CADEN KNUTSVIG

Summer 2023 | University of North Dakota
Internship Location: NASA Langley Research Center

"The NDSGC Space Grant Program allowed me to participate and assist in the fabrication and integration phase of a large-scale multi-year project. This experience will be extremely useful as I prepare for my Senior Design classes and eventual transition into the workforce."



CHEYENNE HARRISON

Summer 2023 | University of North Dakota
Internship Location: Glenn Research Center

"One of the most amazing experiences I have ever had. I've been able to learn much more about data analysis as well as research testing and it has been able to show me what I would like to turn my career goals to after university."

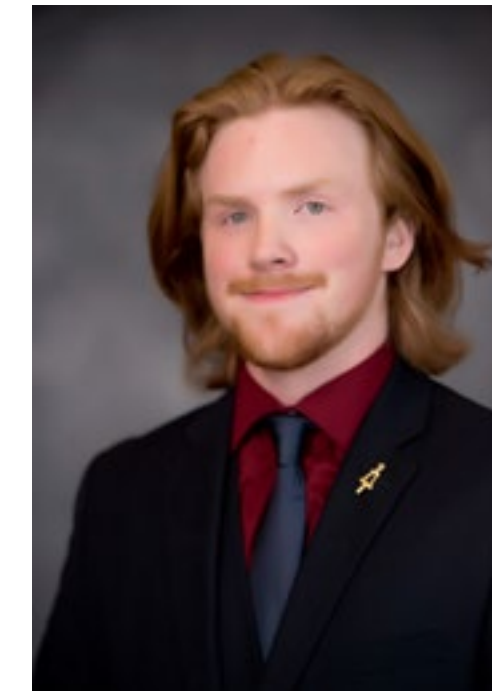


KATE KESLER

Summer 2023 | University of North Dakota
Internship Location: NASA Headquarters

Biological Diversity & Ecological Forecasting Program Support

"It was truly an 'out of this world' experience."

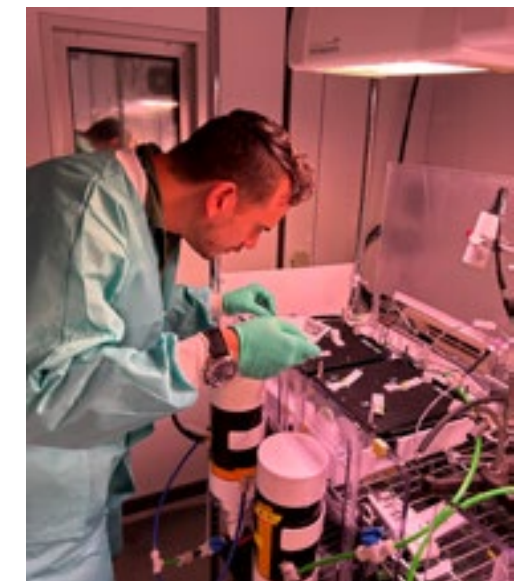


KRISTIAN ANDERS HAUGEN

Summer 2023 | University of North Dakota
Internship Location: NASA Langley Research Center

2D Materials

"This internship through NASA's Langley Research Center has given me a multitude of professional tools regarding research and compilation. I am grateful for the opportunity provided to me by the NDSGC that has allowed me to learn and apply my knowledge in a professional environment."



GILBERT CAUTHORN

Summer 2023 | University of North Dakota
Internship Location: Kennedy Space Center

Space Crop Production

"The opportunity to work and research along the Space Crop Production Team at NASA KSC as an intern has been the single most valuable experience in both my academic and professional career. I am thankful for the opportunity to have been able to have this incredible experience through the support of the ND Space Grant Program. The skills and insight I was able to gain through this program will support my work as a PhD student in the Space Studies department as continue to research crop production systems integration in bioregenerative life support systems."

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.



DID YOU KNOW THE NDSGC HAS A STUDENT RESEARCH FELLOWSHIP BRIDGE PROGRAM?

The Fellowship Bridge Program is a flexible entry-level research program, designed to introduce student transfers into the research at their new program.

<https://ndspacegrant.und.edu/college-students/internships-and-fellowships/bridge-program.html>

FALL 2022



SKYE SCHWARTZ

University of North Dakota
Space Studies

An In-Depth Look on Earth-Anchoring Through Architectural Treatments to Mitigate Psychological and Psychosocial Issues During Long-Duration Spaceflight



GILBERT CAUTHORN

University of North Dakota
Space Studies

Preliminary Analysis of Human Factors in Space Crop Cultivation Interactions

"This experience has allowed me to produce a foundation for not only my doctoral program of research, but also support in developing a testbed for an emergent and crucial element in future long-term space exploration: human factors in space crop production. This research gave me the opportunity to develop a team to support space crop production efforts and research in the ILMAH habitat over two analogue Martian missions. The findings of this project will support in informing future multi-year projects that will support NASA space plant biology goals as well as raise the fidelity of research conducted in analogue settings."

SPRING 2023



SEAN MCCLOAT

University of North Dakota
Aerospace Sciences (Space Studies)

Modeling the Architecture and Composition of Exoplanetary Systems from Pebble Accretion

"The support from ND Space Grant was indispensable. My department offers a wide range of expertise, and the funding for the student research fellowship really enabled me to complement that by building off the department knowledge base into my own direction - that direction has led to my dissertation. The fellowship is a big step for me to do what I came to graduate school to do."



SYDNEY MENNE

University of North Dakota
Physics, Mathematics

Investigating the Dust Tolerance Capability of Additively Manufactured Samples for Lunar Exploration

"Thanks to this NDSGC research fellowship, I had the opportunity to further explore my research interests in a different department than I would typically have the chance to work with! I worked with a lab to examine the erosion of lunar dust simulant on different additively manufactured samples, and have learned many hands-on and experimental processes through the experience."



JACOB YATES

University of North Dakota
Aerospace Sciences

Characterizing the Micrometeoroid Hazard to Future Lunar Surface Operations

"The Space Grant fellowship enabled me to perform high kinetic energy analysis of simulated meteoroid ejecta upon various materials that may be used for future lunar surface operations. The results of these tests may end up being used by NASA's Artemis program. That's what makes space grant such a key enabler for space research and its potential impact for future missions."



Photo credit: Minot State University Communications

MARK VERNON

Minot State University
Biology

Mustelid Population Survey in the Souris River Basin

To read more about Mark's experience in research at Minot State University, check out this article detailing his NDSGC award by Minot State University Communications!



<https://www.minotstateu.edu/pio/news/2023/04/research-provides-vernion-with-the-passion-he-was-looking-for.shtml>

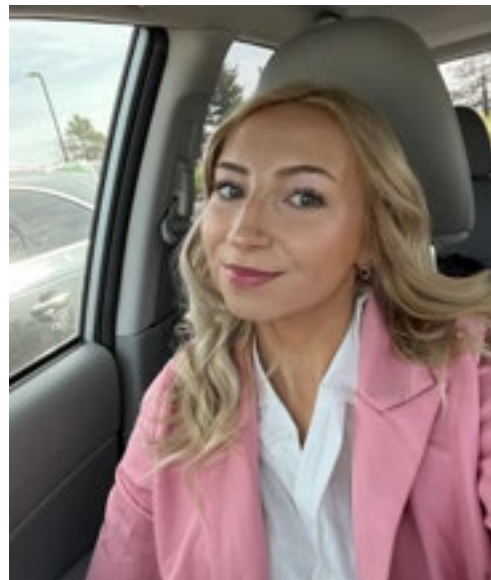
SUMMER 2023



BELLA HETTICH
University of North Dakota
PhD student in Education, Health, and Behavior

The Impact of Experience of Belonging on Major Congruence among Historically Underrepresented Minoritized Students in Aerospace Sciences

"The NDSGC Student Research Scholarship that I received in the summer of 2023, was a catalyst to shape my dissertation that focuses on enhancing aerospace science programs to better engage and support students from marginalized communities. As we approach the spacefaring era, we must ensure the representation of all humanity in this monumental endeavor. I am thankful for the opportunity to be part of the effort through my NDSGC-supported research."



TAYLOR DOLAN
University of North Dakota
Meteorology B.S.

The Role of ENSO on Atmospheric Patterns in the Great Plains of the United States in the CESM2 Large Ensemble

"The NDSGC Student Research Fellowship allowed me to work closely with my advisor over the summer and complete the majority of my thesis. I am so grateful for the opportunity to help accelerate my research progress!"



EMILY BALLUFF
North Dakota State University
Mechanical Engineering

Hybrid Rocket Propulsion Research

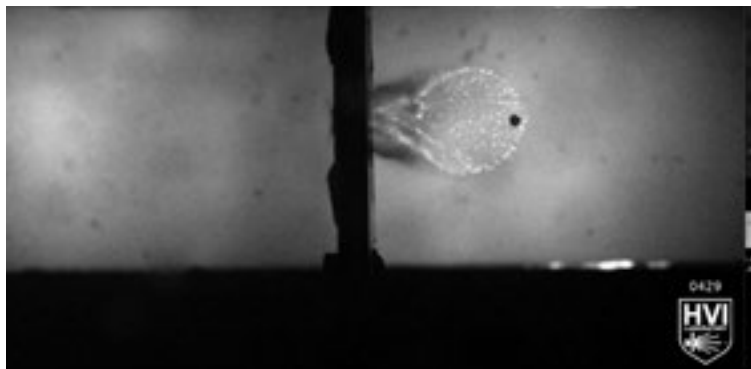
"I am very grateful for the opportunities that NDSGC has provided me. Their support helped me find my passion for jet propulsion systems and inspired me to continue my education to get my Master of Science in Aerospace Engineering."



THOMAS IKEN
University of North Dakota
Physics and Mathematics

Synthesis and Characterization of Tin Selenide's Thermal Conductivity

"The North Dakota Space Grant Consortium has been a pivotal step in my career. I was able to make an impact in the scientific community with my work on the heat transport and frictional properties of thermoelectric material. Additionally, their support allowed me to conduct research as an undergraduate student allowing me to gain valuable skills and helping me be a step above my peers applying for graduate school."



JACOB YATES
University of North Dakota
Aerospace Sciences

Characterizing the Risk of Meteoroid Ejecta for Future Lunar Surface Operations

"This Space Grant fellowship was clutch in helping me procure time and materials for hypervelocity impact testing at the Texas facility (HVIL). Without it, I could not complete my research for my dissertation. I am exceptionally grateful to all at the North Dakota Space Grant Consortium (NDSGC)."

INDUSTRY
Internships

NDSGC-sponsored industry internships allow college students to complete a research project at a STEM-relevant company or laboratory to help develop STEM skill sets. Specific qualities that make a good industry partnership include, but are not limited to, real-world STEM experiences, hands-on and experiential learning, diverse perspectives, and an inclusive and equitable environment. These internships do not involve NASA centers.



MICHAELA NEAL
University of North Dakota
Geological Engineering
Location: Central Sierra Snow Lab

"My NDSGC Industry Internship placement with the Central Sierra Snow Lab was an invaluable opportunity to build experiential knowledge about precipitation measurement and acquire computational skills for working with data, including a first introduction to R programming. This foundational understanding has boosted my awareness of topics and methods in the meteorological literature and broadened my horizons as a future hydrological researcher."

SUMMER FACULTY Fellowships

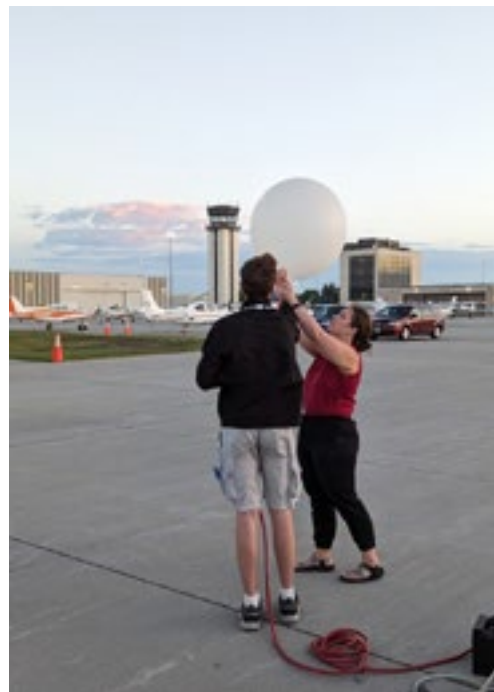
Summer Faculty Fellowships are designed to assist faculty in creating or revising a college-level course that is part of the Science, Technology, Engineering, or Mathematics (STEM) field and is NASA-relevant. This program directly supports one of the goals of NASA Education, and the overall goal of this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



MARCOS FERNANDEZ-TOUS

Space Studies, University of North Dakota

"The 2023 Summer Faculty Fellowship allowed me to develop a new course on nuclear space propulsion. As a geek in anything related to aerospace engineering, I feel honored to have been granted this great opportunity. My best reward is to see students enjoy learning how the machines that will take us to new worlds work."



MONTANA ETTEN-BOHM

Atmospheric Sciences, University of North Dakota

"The Summer Faculty Fellowship has allowed me to focus efforts on DEIAJ initiatives and how we can get those in under-served communities more involved in science. I've also learned more about NASA's initiatives and have a greater appreciation for their short and long-term strategic goals to serve the community and today's student."



JARED MARQUIS

Atmospheric Sciences, University of North Dakota

"The NDSGC Summer Faculty Fellowship provided vital support for to allow for the design of a course open to all UND students that centers around the science and observations of the once-in-a-lifetime 2023 and 2024 solar eclipses."

^ See pgs. 36-37 for more about the Nationwide Eclipse Ballooning Project!



RACHEL SCHOMAKER

Biology, Minot State University

"The NDSGC Summer Faculty Fellowship allowed me to get a jump-start on creating a new Bioinformatics course at Minot State University. With these funds, I was also able to begin a collaborative effort with the UND Genomics Core to obtain robust computational resources for future Bioinformatics students that they would otherwise not have access to."



DAREN ERISMAN

Mathematics and Computer Science, Minot State University

"The redevelopment of an advanced database course into an updated machine learning and data mining course has co-evolved with the beginning of a new data science program for the fall at Minot State. The diversity of interests from these new students has influenced my course design, and the NASA-related data sets and mission are a perfect fit."

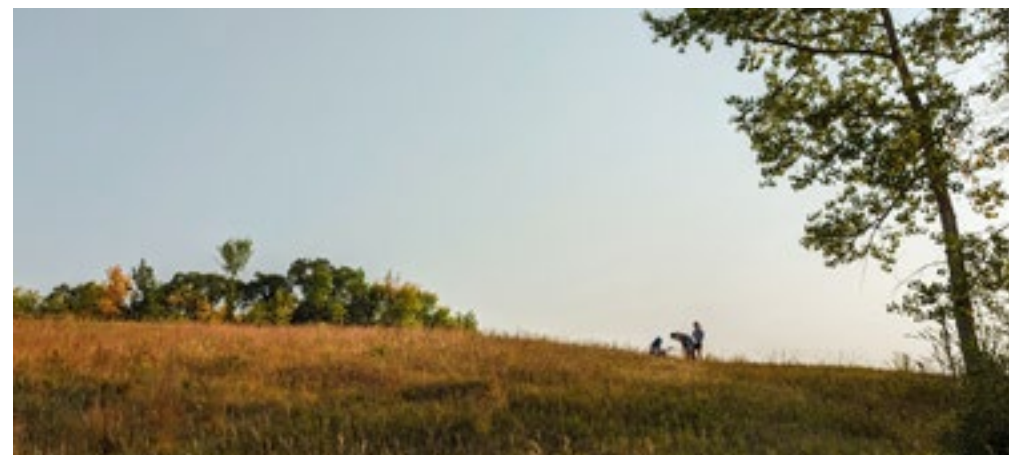


GAUTHAM KRISHNAMOORTHY

Chemical Engineering, University of North Dakota

"The NDSGC Summer Faculty Fellowship enabled me to enhance the course content in my Rocket Propulsion course. As a result of these revisions, students will develop new skills and techniques in the area(s) of Data Science and Analytics and apply them in the context of solving a real world challenging problem faced by NASA."

During the next offering of the course (in Fall '24), students enrolled in the class will apply concepts of probabilistic computing, Bayesian analysis and Physics Informed Neural Networks in the context of predicting the drag forces on a satellite in low earth orbit (LEO) and its subsequent impact on its orbital decay."



TRISTA MONTGOMERY

Science, Valley City State University

"The NDSGC Summer Faculty Fellowship awarded me the opportunity to redevelop our Range Management course in such a way that provides students the opportunity to learn about the current and local research that is directly applicable to the rangelands of the entire great plains region. With a hands-on approach and field trips hosted by professionals, students become well-versed in land management approaches that they can carry into their careers. In addition to this, students in this course now have the opportunity to think critically by synthesizing the working parts of rangelands and create a detailed land management plan of their own as a final project. As a professor in my second year, this was my first opportunity to make a course my own. Thank you NDSGC!"



CHAD WILLIAMSON

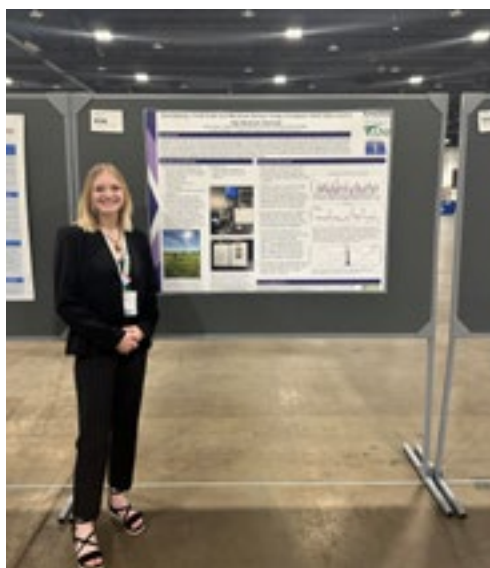
Biology, Minot State University

Photo credit: Chad Williamson | <https://williamsonwildlifelab.com/>

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.

FALL 2022



CASSIDY HOLTH

University of North Dakota
Atmospheric Science and Environmental Studies

"With the help of NDSGC, I had the opportunity to attend the National American Meteorological Student Conference and present my own research. I learned about emerging fields of study in weather, and made many memorable professional relationships."



MATT MALUSKY

University of North Dakota
Mechanical Engineering

"The opportunity provided to me through the ND Space Grant Consortium in helping me attend an international conference on my field of undergraduate study was an experience unlike anything else in my professional career this far. I am very thankful to have been given the chance to present my work and better understand the vast range of applications available to me through research and the development of my professional engineering skills."



COURTNEY CHATBURN

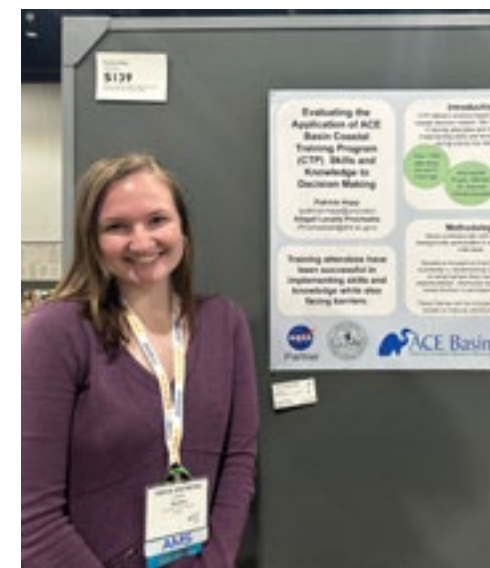
Minot State University
Chemistry

"I am so grateful for the opportunity to expand my knowledge and learn how to utilize my undergraduate research in real world applications which was made possible by the ND Space Grant Program. The ND Space Grant Program has given me the opportunity to acquire a passion for increasing undergraduate research opportunities within Minot State University."



KAELA LUCKE

University of North Dakota
Atmospheric Sciences



PATRICIA HOPP

University of North Dakota
Atmospheric Sciences

"The North Dakota Space Grant Consortium has given me the opportunity to learn, grow, and network with experts across the weather enterprise. Without their support, this trip would not have been possible. Through my experience I have continued to build my professional community, gain insightful information, and share an educational experience with people from around the world."

SPRING 2023



RACHEL JONES

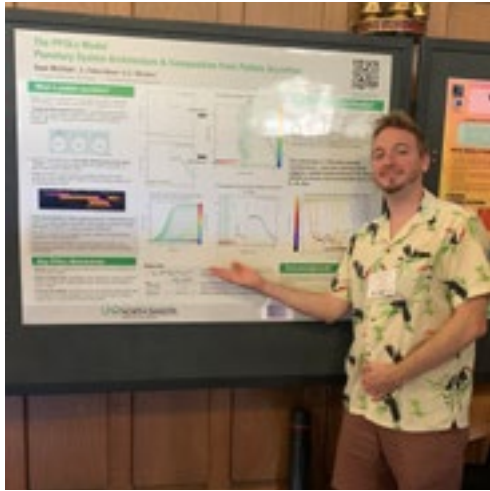
University of North Dakota
Space Studies

SPRING 2023



JACOB YATES
University of North Dakota
Space Studies

SUMMER 2023



SEAN MCCLOAT
University of North Dakota
Space Studies



GRACE HERON
University of North Dakota
Aviation Safety, Commercial Aviation, and Sociology



BAILEY CARLSON
University of North Dakota
Space Studies

"Thanks to ND Space Grant, I was able to attend an informative and spectacular rocket launch event, which provided valuable practical insight into amateur rocket design. I anticipate that this experience will be highly valuable in my continuing propulsion systems research in UND's Master of Science in Space Studies degree program, as well as in my future engineering career."



THOMAS IKEN
University of North Dakota
Physics and Mathematics

ASCEND Grant

The Affiliate Synergistic and Collaborative Engagements across ND (ASCEND) program is designed to promote, develop, and expand NASA research and projects within North Dakota. These grants, which may be research- or teaching-based, will be defined by the goals found within NASA's Mission Directorates (MDs) and the NDSGC's proposal.



LEARN MORE ABOUT THE ASCEND GRANT

<https://ndspacegrant.und.edu/affiliate-members/seed-grants.html>



◀ **ND's Gateway to Science** earned an ASCEND Grant in 2022 that helped them develop a flight simulator education system for rural and western ND students!

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.

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 or staff must be directly involved in the programming to be eligible for a Mini-Grant.

EDUCATOR MINI-GRANTS

Educator Mini-Grants are open to North Dakota formal and informal educators who are teaching, hosting, or participating in research or education initiatives related to STEM and/or NASA. Educator 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.



BELLA HETTICH

Summer 2023 | University of North Dakota
Education, Health, and Behavior

"I'm deeply grateful for the mini grant that allowed me to collaborate with both professionals and students in aerospace sciences. This experience enriched my understanding of the challenges faced by minoritized students in their persistence and it has sharpened my research conceptualization, propelling me further in my dissertation."



NICHOLAS CAMP

Summer 2023 | University of North Dakota
Atmospheric Sciences

"The NDSGC grant gave me the opportunity to go beyond the normal bounds for my senior project, funding my travel costs for my severe storms research. As a result, I got to improve my leadership abilities, field project logistics, and data analysis skills."



JOSEPH COLLETTE

Fall 2022 | Minot State University
Geoscience

Take a Hike and Experience Geology Along the Way!

*Photo credit: Minot State University
Communications*



Check out this MSU article on Joseph Collette!

<https://www.minotstateu.edu/pio/news/2023/07/Joseph-Collette-Bridging-the-gap-between-academia-and-scientific-discovery.shtml>



CHAD WILLIAMSON

Spring 2023 | Minot State University
Biology

Biogeography of Sapelo Island, Georgia

*Photo credit: Chad Williamson
<https://williamsonwildlifelab.com/>*



JENNIFER TRADER

Spring 2023 | Discovery Elementary School

Robotics Opportunities for All

"This mini grant has allowed our robotics organization to grow and reach more elementary students that are curious about the STEM field. We were able to purchase a robotics field and new pieces to expand our inventory for students to design and build a robot. It helped us qualify two teams to represent North Dakota at the VEX Robotics World Championships in Dallas, TX in May 2023! We are very grateful to be a recipient of a NDSGC educator mini grant."

Pictured from L to R: Coaches Ali Glines, Hailey Joyce, and Jennifer Trader

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.



IAN BAUER
University of North Dakota | Aviation Safety and Operations major, French minor



GRACE HERON
University of North Dakota | Aviation and Sociology

"My role as a STEM Ambassador opened my eyes to the different opportunities in education and the continued need for making STEM accessible. My time as a STEM Ambassador so far, has pushed me to look at some of the many barriers in the aerospace industry and has encouraged me to look at pursuing a Master's degree in Teaching and Leadership with an emphasis in STEM Education.

The most rewarding part of being a STEM ambassador is engaging with different students with different abilities and connecting with them through STEM activities!"



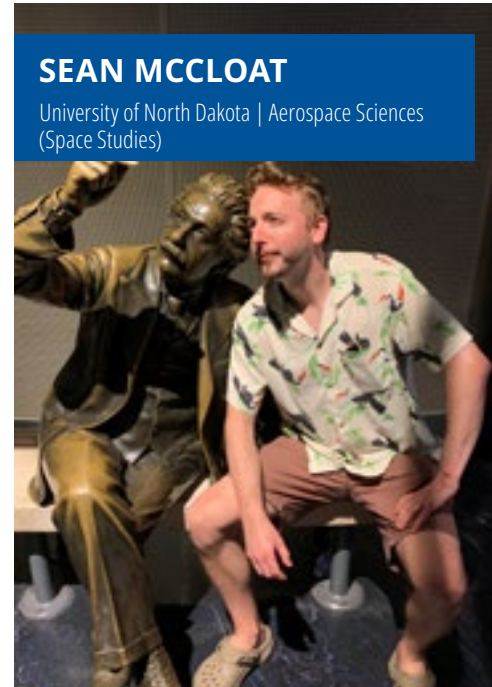
LAINA BEHRENBRINKER
University of North Dakota | Mechanical Engineering

"As a STEM Ambassador I've had the opportunity to surround myself with those who have a passion for all things STEM! This community is so supportive and inspiring, and connections made within this network are invaluable."




JACQUELYN EMERY
University of North Dakota | Commercial Aviation

"This was my third and final year as a STEM Ambassador, and I'm so grateful for all the opportunities I received during my time with NDSGC. Sharing my passion for STEM with North Dakota has brought me so much joy, and I learned new things every step of the way."



SEAN MCCLOAT
University of North Dakota | Aerospace Sciences (Space Studies)

"I love working with ND Space Grant and the STEM Ambassador program. The coordinators and students are all very passionate about science education and its easy to catch that excitement. It makes the role dynamic and a lot fun to contribute to."



SYDNEY MENNE
University of North Dakota | Physics and Astrophysics, Mathematics

"Being a STEM Ambassador allowed me to explore creative and fun ways to promote STEM within the community. It was a very fulfilling job, and has opened so many doors! I have thoroughly enjoyed working to open similar doors for others, and share the many incredible opportunities available through the NDSGC."



AMANDA HIGGINBOTHAM
University of North Dakota | Aeronautical Science and International Studies

"Being a STEM Ambassador has allowed me the opportunity to promote my passions while uplifting others through experience and education. There's nothing more fulfilling or more motivating than introducing a child/a peer to the endless possibilities of all things STEM!"



THOMAS POWER
Bismarck State College (at time of employment), University of North Dakota (current) | Composite Science Education

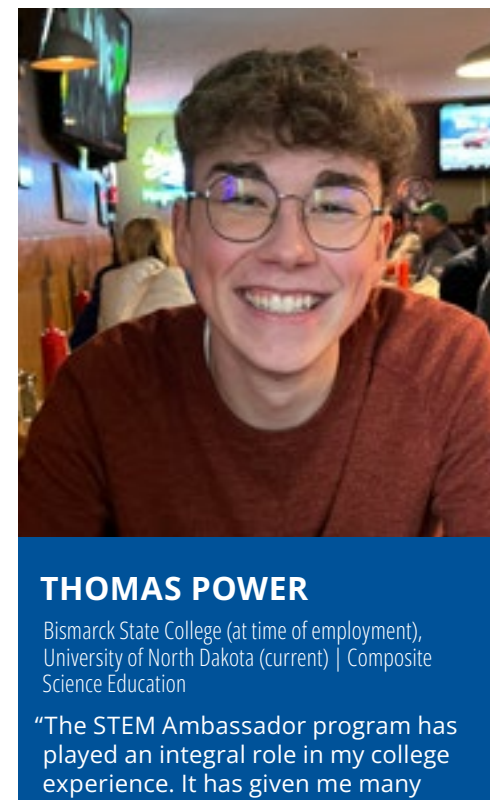
"The STEM Ambassador program has played an integral role in my college experience. It has given me many opportunities to grow as an educator and has allowed me to become more involved in my community. I have loved every second!"



VINCENT LEDVINA
University of North Dakota | Physics



"My time with the NDSGC as a STEM Ambassador taught me how to be an effective science communicator and educator. I use these skills on a daily basis when communicating with the public and to the media about aurora science and space weather."



DANNY ERDMANN
University of North Dakota | Commercial Aviation





ABIGAIL MOE
University of North Dakota | Psychology

"Being a STEM ambassador was incredibly enjoyable and served as a great way for me to meet new people my first two years in college. It also allowed me to surround myself with new knowledge on subjects I had rarely thought about beforehand, like NASA, for example."



HOPE BURDOLSKI
University of North Dakota | Secondary Science Education

"I have loved being a STEM Ambassador. Through this program, I have learned how to be a better educator and created partnerships across the state. I am excited to continue working with the NDSGC as an affiliate (Senior STEM Educator for North Dakota's Gateway to Science)!"



CASSANDRA TAGGART
University of North Dakota | Atmospheric Sciences & Middle-Level Education

"Being a STEM Ambassador has been an absolute dream! I wish I'd never wake up. I've been able to experience tremendous growth not only as a STEM educator but also within myself as a leader thanks to the amazing Space Grant team and my fellow STEM Ambassadors."



KAYLEE BEACHLER
University of North Dakota
Civil Engineering major, Sustainability minor



LINDSEY KIECKER
Valley City State University
Chemistry Education

"The STEM Ambassador Program provided me experience planning and facilitating STEM activities. I thoroughly enjoyed the experience!"

BECOME A
**STEM
AMBASSADOR!**



LEARN MORE ABOUT THE STEM AMBASSADOR PROGRAM AND APPLY TODAY!

<https://ndspacegrant.und.edu/college-students/stem-ambassadors.html>

AWARDED Scholarships

PEARL I. YOUNG SCHOLARSHIP

The NDSGC established the prestigious Pearl I. Young Scholarship for a student pursuing a STEM degree at the University of North Dakota. These students must also hold a minimum GPA of 3.5, and identify as women, girls, trans, non-binary, or gender expansive. This \$2500 award honors Pearl I. Young and her many contributions to the NACA, NASA, and STEM fields.



LEARN MORE!

<https://ndsgrantspacegrant.und.edu/college-students/scholarships/pearl-i-young.html>



ELIZABETH STAROSTA

ELISABETH STAROSTA

Biomedical Engineering

Elisabeth Starosta is a sophomore double majoring in Biochemistry and Molecular & Integrative Biology. She is currently working in Dr. Binglin Sui's laboratory, working on synthesizing fluorescent probes to attach to a nanoprodug targeting pancreatic tumors. After her undergraduate education, she hopes to attain an MD/PhD and conduct research in drug development.

MOLLY RAYHORN

Electrical Engineering

"I am completing my sophomore year in electrical engineering at the University of North Dakota. In addition to my coursework, I enjoy being involved in the campus community. I am the vice president of the Society of Women Engineers which provides many outreach activities for children in the community, as well as opportunities to hear from industry professionals. As the electrical team lead for Engineers Without Borders, I am able to apply what I learn in class to real world problems. We work on designing, implementing, and monitoring water purification systems in Guatemala. I also enjoy volunteering through organizations such as the Big Event, as well as participating in networking events hosted by the Young Professionals.

After graduation, I hope to work on designing lighting and other electrical systems in buildings. The support provided by this scholarship is greatly appreciated, as it will allow me to focus on my education while taking advantage of all the opportunities UND has to offer."



MOLLY RAYHORN



LEARN MORE!

<https://ndsgrantspacegrant.und.edu/college-students/scholarships/lillian-goettler.html>

LILLIAN GOETTLER SCHOLARSHIP

The NDSGC established the prestigious Lillian Goettler Scholarship for a student pursuing a STEM degree at North Dakota State University. These students must also hold a minimum GPA of 3.5, and identify as women, girls, trans, non-binary, or gender expansive. This \$2500 award honors Lillian Goettler and her many career contributions in STEM.



KATRINA DIETZ

KATRINA DIETZ

Civil Engineering and Spanish

"I am a junior in Civil Engineering and Spanish at North Dakota State University. After graduation I plan to earn my MBA and work towards becoming a professional engineer. Currently, I am involved on campus with the society of women engineers and engineering ambassadors. Both of these organizations have given me opportunities to spark interest for STEM among young students. With SWE, I have been able to volunteer at girls outreach events for students of all ages and share my experiences on a panel for 8th grade girls interested in engineering. With engineering ambassadors, I get to show all the things I love about engineering and NDSU when students tour to help them determine if it is where they belong. I look forward to continuing this outreach as an ambassador for the college of engineering and the president of SWE in my senior year. It feels good to help students find their passion and feel like they belong and I am excited to see that even more in the future. I am so thankful for this scholarship, as it allows me to focus more time and energy on my education while doing things I love on campus!



LEA KOBROSSY

LEA KOBROSSY

Biological Sciences with a pre-med emphasis

"I am a biological sciences major with a pre-med emphasis. Thanks to the ND Space Grant Student Research Fellowship, I have been able to pursue my interest in pre-medical studies while attending North Dakota State University. This fellowship has provided me with vital financial support that has enabled me to focus on my coursework, conduct research, and

participate in extracurricular activities without worrying about the financial burden of tuition and living expenses. As a sophomore, I have already gained valuable knowledge and skills that will serve me well as I continue my pre-medical education. I am grateful for this opportunity and look forward to utilizing the resources and support provided by the fellowship to achieve my goals in the medical field."

HAILEY HIGHLAND

Mechanical Engineering

"I am a first year student at North Dakota State University. I am pursuing a degree in Mechanical Engineering, and I am planning on completing a Robotics minor while at NDSU. During my time at NDSU, I have become involved with numerous clubs and organizations. I have been a member of the Engineering Leadership Learning Community, where I have developed healthy study habits alongside peers who are also studying engineering. I have been a part of NDSU's division of Society of Women Engineers and the Women's Club Soccer Team. I was recently accepted into Engineering Ambassadors, which provides me with the opportunity to interact with future engineering students and represent the College of Engineering. I am the Vice President of the Grand Challenge Scholars Club on campus, and I am taking a seminar class that is providing me with the resources needed to become involved with research on campus. While I have not yet chosen a specific project, I am planning on becoming involved with robotics research on campus in the next year. I am looking forward to the rest of my time at NDSU, and I am excited to gain more experience and knowledge as a Mechanical Engineer."



HAILEY HIGHLAND

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.



STARLA LITTLEWIND
Cankdeska Cikana Community College



KACEY MURDOCK
Nueta Hidatsa Sahnish College



LARIN CRISSLER
Turtle Mountain Community College



SHANG AGARD
Sitting Bull College



GERIKA KINGBIRD
United Tribes Technical College

NDSGC SCHOLARSHIPS

Each academic year, the NDSGC provides scholarship funding to affiliate schools. Scholarship recipients are selected by faculty and staff at their home institution. Students must have an excellent academic record and be majoring in a STEM field.

BISMARCK STATE COLLEGE

Andrew Schwartz
Reno Ogden
Thomas Power

CANKDESKA CIKANA COMMUNITY COLLEGE

Starla Littlewind
Derik Bull
Tara Dauphinais
Randy Leben
Dorvan Mckay

DAKOTA COLLEGE AT BOTTINEAU

Keily Albertson
Dalton Anderson
Koylynn Gulliford
Fallon Kramer
Whitni Peck
Sutton Shurley
Aaron Springer

DICKINSON STATE UNIVERSITY

Jonathan Schendel
Isabel Lopez
Madison Beckler
Anna Beer
Cole Jensen
Ucechukwu

LAKE REGION STATE COLLEGE

Lauren Voeller
Lindsey Nyhagen
Matthew McCollum

Alexa Holth
Jozey Goodall
Jaden Boardman
Hannah Lundeby

MAYVILLE STATE UNIVERSITY

Kaitlin Ensign
Samantha Passa
Ellie Rierson
Riley B Wass
Trevor Gravseth
Taylor Painter
Jesse Halverson
Kayla Rocholl
Gerrit Bjornstad

MINOT STATE UNIVERSITY

Madison Elliott
Ross Hardy
Jacob Jensen
Karen Robinson
Quinn Sullivan
Keegan Summers
Cayden White
Rebecca Zeitzew
Krista Permentier
Spencer Gordon
Clayton Mantz
Sarah Upton

NORTH DAKOTA STATE COLLEGE OF SCIENCE

Jayden Hicks
Noah Cunningham
Eric Formo
Katie Gostovich
Jacob Trout

Jacob Bredeson
Jada Griffin

NUETA HIDATSA SAHNISH COLLEGE

Kacey Murdock
Shadlynn Severance
Michael Medeiros
Pierre Pretty Weasel
Chelsey Quick Bear
Shaundeen Smith

SITTING BULL COLLEGE

Zane Prentice
Lawrence Village Center III
Shang Agard

TURTLE MOUNTAIN COMMUNITY COLLEGE

Larin Crissler
Izabella Baker-Schilken
Quentin Brien
Nick Dionne
Nathan Conley
Brandon Roussin
Kelsey Bercier
Christina James
Duane Jerome
Tyra Jerome
Talon DeCoteau
Gracee Poitra
Seth Belgarde
Falyann Ferris

UNITED TRIBES TECHNICAL COLLEGE

Gerika Kingbird
Jennifer Fragua
Kianna Stroh

Robert Sam
Tanner Veo
Brett Alberts
Sara Fruetel
Bowen Simpson
Audrey Hall
Camille Youngbird

VALLEY CITY STATE UNIVERSITY

Jamie Burkle
Macie Danielson
Bryan Delaney
Ashanti Harris
Jocelyn Kriewald
Misa Miyashiro
Macy Olstad
Bridger Pulver
Jennifer Sandberg
Cassidy Sanderson
Ava Wille
Neeliegh Wollenzien
Alora Woodruff
Madison Yoder

WILLISTON STATE COLLEGE

Ulises Gonzalez
Chiara Marsh
Hudson Kjos




The 2021 NDVS/SB Scholarship Winners. (From left to right) NDSGC Associate Director Tori McIntosh, Scholarship Winner Dietrich Schlichtmann, NDVS/SB Faculty Cindy Williams, Scholarship Winner Menuka Rai, and former NDSGC Deputy Director Marissa Saad.

NDVS/SB 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.

Up to five scholarships, from a collective total of \$2,500, will be awarded. The amount and number of scholarships awarded will be determined by need and the number of eligible applicants.



LEARN MORE!
<https://ndspacegrant.und.edu/college-students/scholarships/ndvssb.html>

Students studying STEM at any the NDSGC's 16 affiliate schools and who qualify for services from the NDVS/SB are highly encouraged to apply. The scholarship was awarded for the first time during the 2020-2021 academic year (pictured above).

UND AEROSPACE COMMUNITY DAY 2024

Saturday April 6, 2024 | 10am-3pm

Join us for Aerospace Community Day — a day full of fun and prizes!

Tour the facilities and stamp your Aerospace Passport at various hands-on stations, fly spacecraft and aircraft simulators, and experience the thrill at UND Aerospace.

Attendance: FREE!

Parking: UND will not be ticketing on the day of our event when you park in UND Aerospace parking lots.

Check-in: Doors open at 10am where you will check-in and grab your passport. All entrances will be marked by green or black UND Aerospace flags!

The first 500 kids to check-in will receive a free t-shirt! *First come first served, while supplies and sizes last.*

ALL AGES WELCOME!

Children must be accompanied by an adult.



learn more:
aero.UND.edu/events/community-day

 **Facebook Event:** 2024 UND Aerospace Community Day



NATIONAL STUDENT Competitions

The North Dakota Space Grant Consortium proudly provides funding to students participating in regional and national NASA and STEM competitions. It is imperative that students be given the chance to partake in these events as they challenge a student's collaboration and problem-solving skills while promoting innovation.

UNIVERSITY OF NORTH DAKOTA'S NASA STUDENT LAUNCH & SPACEPORT AMERICA CUP TEAM

The UND Advanced Rocketry Club competed in two competitions during the 2022-2023 academic year. Their first was the NASA Student Launch that took them to Huntsville, Alabama to compete and the Spaceport America Cup, an Intercollegiate Rocket Engineering Competition that hosts students from across the globe and is held in New Mexico.

The club continues to grow and during the 2022-2023 competition year they constructed one of their most powerful rockets, yet. The 2022-2023 rocket featured a fully 3D printed payload/nose cone design. The team is excited to return to both competitions next year.

NORTH DAKOTA STATE UNIVERSITY'S ROBOTICS MINING COMPETITION TEAM

NASA's Robotics Mining Competition challenges teams to design, build and operate a robot capable of mining materials on lunar surfaces. Teams must take weight, power, communication, and technical capabilities into consideration when participating in the competition.

NDSU's 2022-2023 Bison Robotics club intended to minimize their robot's size and weight and improve its mining capabilities. The team continues to learn from past successes and failures to improve their robots.

The Bison Robotics club works with local schools, Girl Scout troops, and organizers from Introduce a Girl to Engineering Day to engage future engineers.

UNITED TRIBES TECHNICAL COLLEGE'S FIRST NATIONS LAUNCH TEAM

Each year the Wisconsin Space Grant hosts the First Nations Launch, offering Tribal Colleges and Universities, Native American-Serving Nontribal Institutions, and American Indian Science and Engineering Society students the chance to showcase their engineering skills pertaining to high-powered rocketry.

The 2022-2023 United Tribes Technical College team were high achievers, receiving awards across four categories including the Moon Challenge, Oral Reports, Written Reports, and Aesthetics.

The team hopes to return to the competition next year and continue to excel.

UNIVERSITY OF NORTH DAKOTA'S FSAE ELECTRIC RACECAR CHALLENGE TEAM

The goal of Formula SAE Competition is to design, build, and race an open-wheel formula style race car in the span of nine months. Initially starting out as a senior design project, UND Formula SAE eventually transitioned into a student organization open to all majors across campus.

The 2022-2023 team made the switch to being a Formula SAE Electric vehicle team, utilizing an Emrax 208 Electric motor. The current team consists of approximately 30 students. Among them, 17 members are returning from last year's team.



UNIVERSITY OF NORTH DAKOTA'S NASA STUDENT LAUNCH & SPACEPORT AMERICA CUP TEAM

"The support that the NDSGC has provided the Advanced Rocketry Club this year has been incredibly important to our successes throughout the year. We are very excited to continue to explore, build, and reach for the stars."

Pictured: A team member from the UND Rocketry Club works on their final product.



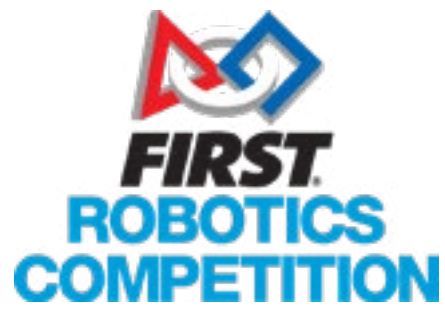
NORTH DAKOTA STATE UNIVERSITY'S ROBOTICS MINING COMPETITION TEAM

Pictured: team logo



UNITED TRIBES TECHNICAL COLLEGE'S FIRST NATIONS LAUNCH TEAM

Pictured: Logo from the Wisconsin Space Grant's First Nations Launch competition.



The FIRST (For Inspiration and Recognition of Science and Technology) Robotics Competition "prepares young people for the future through a suite of inclusive, team-based robotics programs." Their "thrilling, sports-like challenges build [students'] self-confidence and collaborative problem-solving skills and have a proven and lasting impact on STEM learning and interest. Participants and alumni gain access to education and career discovery opportunities, connections to exclusive scholarships and employers, and a place in the FIRST community for life."

The NDSGC is proud to fund teams from across the state, adding more teams each year. These ND teams have a rich history of excellent placement at regional competitions and World Championships.

FIRST Robotics

GRAND FORKS: TEAM #8188

The FIRST Robotics team out of Grand Forks is mentored by students at the University of North Dakota. During the 2023 competition year the team competed in two different regional competitions, the Great Northern Regional in Grand Forks and the Wisconsin Regional in Milwaukee. The experience of these competitions advanced the knowledge base of the team by introducing a brand new style of drive train and all new electronics for the students to program. Students of the Grand Force team gained new skill sets and techniques pertaining to robot design and construction throughout the season.

CANDO: TEAM #877

FIRST Robotics Team #877 built a small, stable, and quick robot during the 2023 season. Mentors watched as the FIRST Robotics students enhanced their communication skills and found their confidence. Coined as the "hardest fun ever," students learned how to utilize industry tools and resources during the 2023 season. The FIRST Robotics mentors from Cando continue to raise awareness about STEM careers and the importance of taking on challenges with their team.

JAMESTOWN: TEAM #7578

The Quantum Misfits, Jamestown's FIRST Robotics team, includes students from 12 different schools. The 2023 season marked the 5th year the team has participated in the FIRST Robotics program. The Quantum Misfits' team shop is located in the Jamestown High School, allowing for access to a precision machining shop and a central location for the team members and their community mentors. Industry professionals assist the Quantum Misfits in their machine lab and with the designing and programming of their competition robot.

ROLLA: TEAM #8255

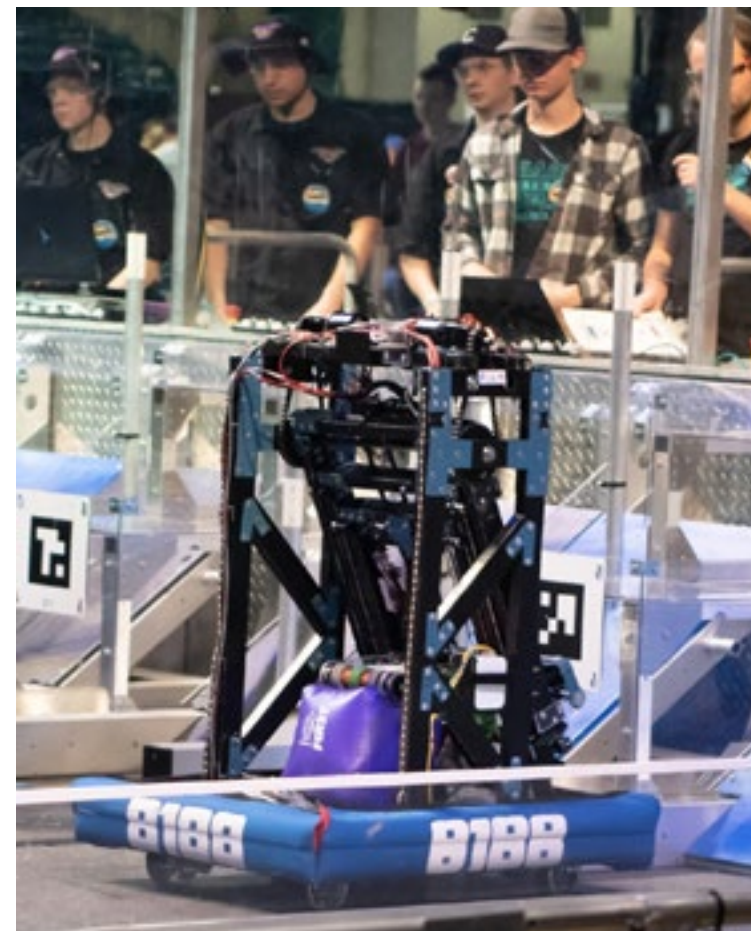
The Rolla Robodogs continued to give it their all during the 2023 FIRST Robotics season. With the support and expertise of local educators and community mentors, the Rolla Robodogs tackled the 2023 season by splitting into three sub teams: a build team, a promotional team, and communications team. The Rolla Robodogs have a large FIRST Robotics support network that includes both their school and community, allowing the young, talented, and committed students of the Rolla Robodogs the chance to grow their STEM skill sets while participating in FIRST Robotics.

HATTON-NORTHWOOD: TEAM #876

Thunder Robotics had a great 2023 FIRST Robotics season. They won the championship title at the Minnesota North Star Regional Tournament in La Crosse, WI. This regional win qualified the team for the World Championships in Houston, TX.

Thunder Robotics received the Creativity Award at the Great Northern Regional and won the Autonomous Award at another regional competition. The Autonomous Award is presented to a team that has "...demonstrated consistent, reliable, high-performance robot operation during autonomously managed actions."

During the World Championships in Houston, Thunder Robotics advanced to the division semifinals before being eliminated. Of team's 8 seniors, two have gone onto the military and five are enrolled in STEM programs at their respective colleges.



GRAND FORKS: TEAM #8188



HATTON-NORTHWOOD: TEAM #876



CANDO: TEAM #877



JAMESTOWN: TEAM #7578



LEARN MORE ABOUT FIRST ROBOTICS

Scan the QR code or visit:
<https://www.firstinspires.org/>

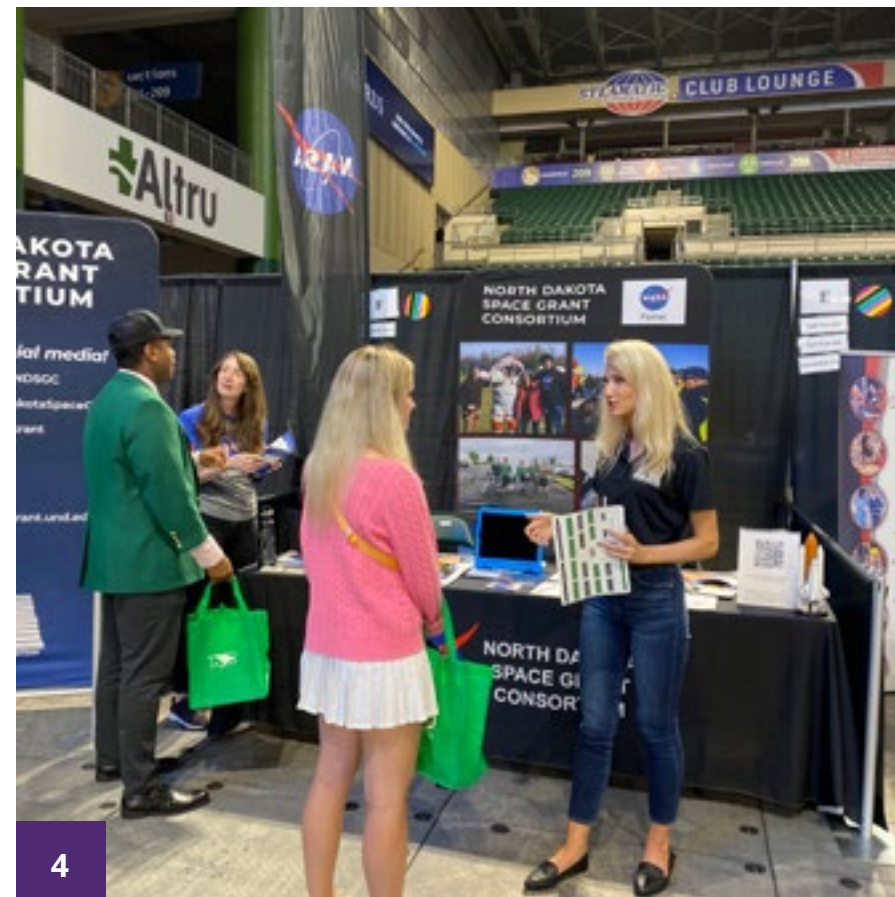
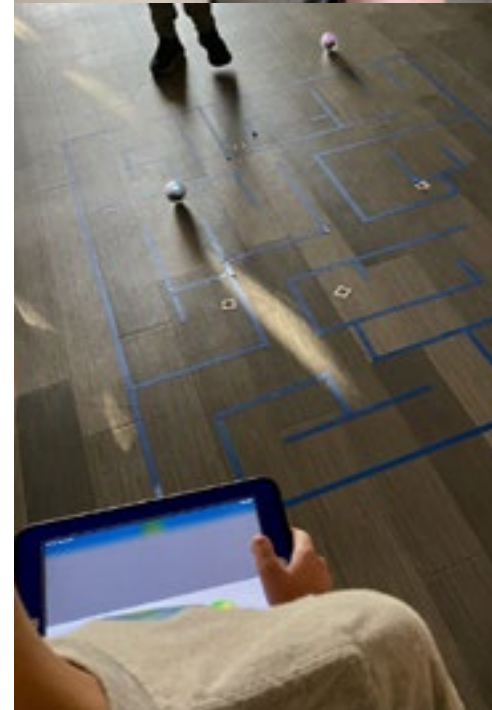
COMMUNITY Engagement Events



1 McBride, Angus (1931-2007). Paul Bunyan and Babe.



The NDSGC supports STEM engagement events across North Dakota for K-12 students, educators, families, and the entire ND community. These events occur throughout the year, and are largely supported through the active STEM Ambassador program. These STEM Ambassadors travel across the state, participate in affiliate-led events, and lead their own classroom visits and public engagements. Thousands of North Dakotans are engaged each year in NASA and STEM through these events.



1: NAME AN EXOWORLD 2022 OUTREACH CAMPAIGN

STEM Ambassador Sean McCloat facilitated a brief but enthusiastic campaign to submit an entry to rename an alien planet!

This was the "IAU Name An ExoWorld 2022 Campaign", and the NDSGC received entries from four different groups comprising over 30 students, teachers, and astronomy enthusiasts from Grand Forks, Fargo, and more.

The winning names submitted were "Bunyan & Babe" for the star HD 95086 & planet HD 95086b.



READ MORE!

<https://blogs.und.edu/jdosas/2023/01/name-an-exoworld-2022/>

2: NORTH DAKOTA'S GATEWAY TO SCIENCE FREE FAMILY DAY

NDSGC STEM Ambassador Laina Behrenbrinker hosted an activity booth at the North Dakota's Gateway to Science Free Family Day in both Newtown, ND and Wilton, ND. This event served hundreds of

students and their families with a carnival-like event, full of STEM Engagement booths.

3: JAMESTOWN ENGAGEMENT EVENTS

In Fall 2022, VCSU STEM Ambassador, Lindsey Kiecker Snyder, led robotic "Sphero Mazes" with students in the Jamestown, ND community. She also led the "Constructing a Heat Shield" activity for spacecraft with a group of Girl Scouts from Valley City, ND.

4: FALL 2022 UND CAREER EXPO

The NDSGC attended the Fall 2022 UND Career Expo at the Alerus, sharing scholarship, internship and STEM engagement opportunities with students.

5: DCB STEM DAY

The NDSGC visited Dakota College at Bottineau in Fall 2022 where they shared Space Grant opportunities and launched rockets with local junior high students.

UND EVENTS

STEM Ambassadors also led UND events throughout the year.

- **Sean McCloat** led a series of "Atmospherium De-stress Shows" where he led planetarium shows for college students during their busy semesters and exams
- **Sydney Menne** led a partnership with the UND Art Collections to establish an official NDSGC collection of NDSGC artwork within the university
- **Grace Heron** engaged students during "Aerospace Admitted Day" to share NDSGC opportunities with future UND Aerospace students.



6: FALL 2022 NORTHERN VALLEY CAREER EXPO

The NDSGC introduced high school students to STEM and NASA careers at the Fall 2022 Northern Valley Career Expo.

7: MEMORIAL UNION BOOTH EVENTS

Amanda Higginbotham, F22 and Sp23

The NDSGC hosted booths at the Memorial Union throughout the academic year. Students could stop by to learn about NDSGC opportunities, meet STEM Ambassadors, and partake in STEM activities.

8: GIRL SCOUTS ROCKET LAUNCH

In May 2023, STEM Ambassador Amanda Higginbotham worked with Girl Scouts to build an launch their very own rockets! The event was led by the University of North Dakota Department of Physics.



Scan the QR code to view the Instagram Reel of the day!



8 "THIS ROCKETRY EVENT WAS A FULL DAY OF MAKING NEWTON'S THIRD LAW FUN, AS THE GIRLS BUILT AND LAUNCHED SEVERAL ROCKETS. IT WAS A VERY REWARDING K-12 OUTREACH OPPORTUNITY!"

– Amanda Higginbotham, NDSGC NASA STEM Ambassador, 2023

MENTOR CENTER

In Fall 2022, the STEM Ambassador program established a partnership with the Grand Forks Mentor Center, a "national award-winning resource center for Grand Forks Public Schools middle and high school students to receive academic support, social-emotional support, and enrichment." Several STEM Ambassadors led hands-on NASA and STEM activities with these students during after-school hours throughout the academic year.

Scan the QR code or visit <https://www.gfschools.org/departments/mentor-center-program> to learn more!



< NDSGC AND NDVS/SB AEROSPACE TOUR

Make sure to read about this event on *UND Today!*

Space Grant Consortium makes space for everyone

May 11, 2023 | by Walter Criswell

Photos by Walter Criswell/UND Today.

READ THE STORY ON UND TODAY!



<https://blogs.und.edu/und-today/2023/05/space-grant-consortium-makes-space-for-everyone/>

"THE IMPORTANT THING FOR US WITH NASA IS TO PROMOTE DIVERSITY AND ACCESSIBILITY FOR EVERYONE IN THE FIELD. THERE ISN'T JUST ONE TYPE OF PERSON WHO CAN GET INTO SPACE STUDIES; WE'RE REALLY TRYING TO PROMOTE THE IDEA THAT IT'S FOR EVERYONE."

– Grace Heron, NDSGC NASA STEM Ambassador, 2023

Top left: A student from the North Dakota School for the Blind tests out one of UND's space helmets.

Top right: NASA STEM ambassador and UND aviation student Amanda Higginbotham talks with a student after the tour.

Bottom: An NDVS/SB student tests out the control panel located in UND's shuttle simulator.

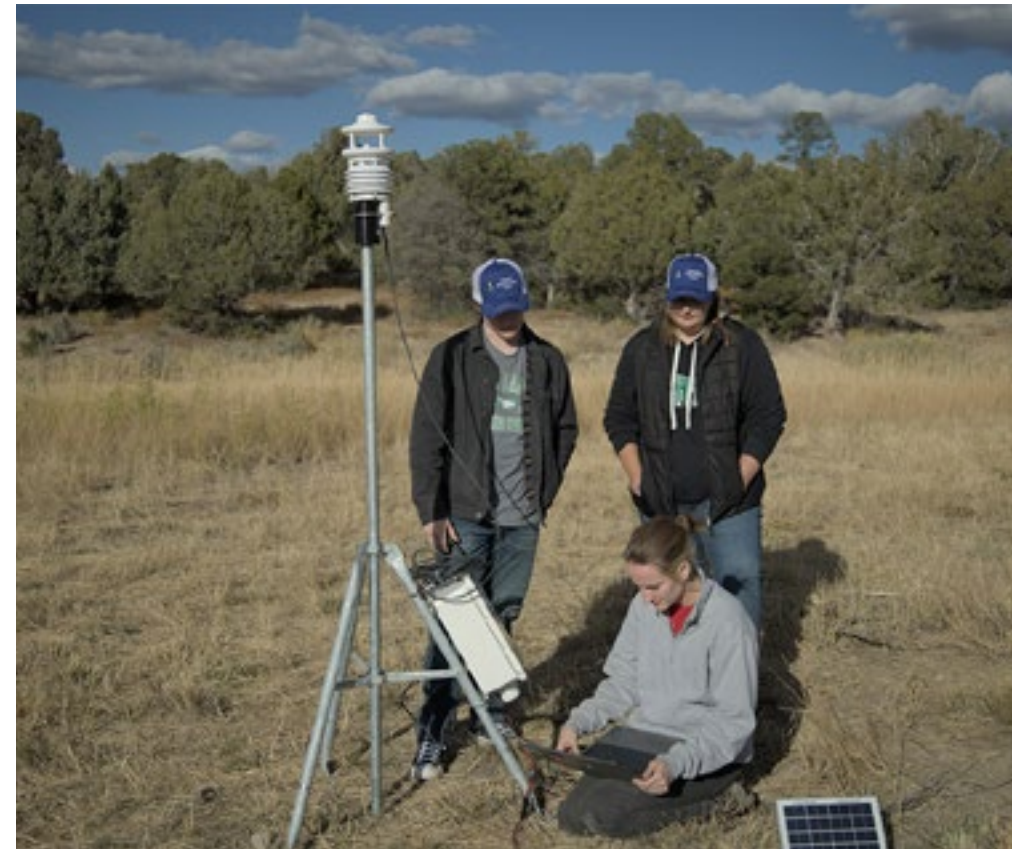


READ THE STORY ON UND TODAY!

<https://blogs.und.edu/und-today/2023/11/sun-moon-and-balloons/>



Students prepare to launch one of 30 weather balloons released between Oct.13 and 14. Photo by Anissa Kulzer.



Students at the ground station monitor data being transmitted through sondes attached to the balloon. Photo by Jared Marquis.

NATIONWIDE ECLIPSE BALLOONING PROJECT

The NDSGC was awarded additional grant funding to support their team's participation in the Nationwide Eclipse Ballooning Project (NEBP).

UND Atmospheric Science faculty, Dr. Montana Etten-Bohm and Dr. Jared Marquis serve as the co-leads for the team, focused on radiosonde launches during the 2023 Annular and 2024 Total Solar Eclipses. These two faculty members were also awarded summer faculty fellowships in 2023 to support them in this role, and in course development directly related to the eclipse.



Learn more about NEBP online by scanning the QR code or visiting <https://eclipse.montana.edu/>



The annular solar eclipse as seen from UND's launch space near Mesa Verde National Park. Photo by Jared Marquis.

The groups worked out of an unfinished lab space offered to them by Pueblo Community College, not far from Mesa Verde National Park, where the balloons were launched.

After 30 hours, UND's crew successfully launched 28 of the 30 balloons, losing one after its GPS signal was lost and another after a balloon popped miles before the tropopause.

[Scan the QR code or visit the link to read the full story on UND Today!](#)

FROM UND TODAY: Sun, moon and balloons

November 30, 2023 | by Walter Criswell

UND scientists, students launch weather balloons in Colorado to track atmospheric changes caused by solar eclipse

Eleven UND students hit the road for a 22-hour car ride with atmospheric science professors Jared Marquis and Montana Etten-Bohm in October. Along for the ride were 30 balloons, radio equipment, cloth gloves and several canisters of helium.

Their destination: Cortez, Colo., a small municipality nestled in the southwest corner of the state near New Mexico. Cortez and nearby Mesa Verde National Park fell in the thin strip stretching from Oregon to Panama where the annular solar eclipse (when the sun is partially covered, creating a "ring of fire" around the moon) was visible on Oct. 14.

The students and faculty traveled there to collect data as part of the Nationwide Eclipse Balloon Project, a NASA- and National Science Foundation-sponsored program started in 2017 at Montana State University. The project teaches students from 75 schools around the country about atmospheric sciences and engineering by launching weather balloons during annular and total solar eclipses.

Jared Marquis, assistant professor of atmospheric sciences at UND, said the department started preparing for the event last fall, when plans for the trip fell into place. Last summer, Marquis and his colleague in atmospheric sciences, assistant professor Montana Etten-Bohm, traveled to Kentucky to learn about the process of launching weather balloons. Then, they went about relaying this information to students.

Marquis used his experience in Kentucky to create a semester-long course which would explain the data they were trying to collect and walk students through the launch process. The course culminated in a launch in Clifford Hall's parking lot a month before the eclipse.

"We started launching them at nine in the evening, after it was dark outside," said Marquis. "We wanted to practice launching in semi-adverse conditions, so we were working in the dark using headlamps to see what we were doing."

Test balloons were provided by NEBP, and Marquis and Etten-Bohm worked with the North Dakota Space Grant Consortium to buy helium for their test launches. The consortium also helped pay for student meals on the trip to Colorado.

The process can be delicate, said Marquis. Students have to wear cloth gloves when handling the balloons to protect them from oil on their skin, which can affect the elasticity of the balloon and cause the balloon to burst too soon.

The filling of balloons requires an equal amount of care. The balloons ascend more than 100,000 feet, Marquis said. That means too much helium could cause a balloon to burst too soon as the gas expands, but an underfilled balloon could drift off course as it rises too slowly.

"In Colorado, one of our balloons floated 160 miles downrange. We were out in the middle of nowhere when I got a call from the sheriff saying they found it in a powerline," Marquis said with a laugh.

The balloons must reach high altitudes in order to work well above the tropopause, the thin layer of atmosphere between the stratosphere and troposphere. The tropopause contains the jet stream, a powerful river of wind and an interesting location for measuring changes in the atmosphere at the time of a solar eclipse.

Several large canisters of helium were on site to fill the balloons to a specific pressure. Each balloon had to be filled just

before its launch, as team members didn't want to leave the balloons filled for too long, Marquis said.

Sondes – small transmitters that signal changes in the atmosphere to a station on the ground – were attached to each balloon. Using these tools, the students collected data to see if the annular eclipse affected air pressure, temperature and wind speed.

Marquis said that the information collected as a part of NEBP is helpful for several reasons.

"Understanding what's happening in the atmosphere during eclipses can be useful for figuring out whether our existing models are working," Marquis said. "It's also helpful for our understanding of how the atmosphere is functioning. We can look at how things work when the sun is 'turned off' in this relatively small area to see how that might change things on the ground and throughout the atmosphere."

In total, the three groups launched a balloon an hour for 30 hours. Marquis said they started the launches 24 hours before the eclipse to establish a baseline to compare to the data collected during the annular eclipse.

INFLATABLE LUNAR/MARS ANALOG HABITAT

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.

ESCAPE FROM ASTRONAUT TRAINING

THE NDSGC'S **ESCAPE FROM ASTRONAUT TRAINING** IS A SERIES OF CROSS-DISCIPLINARY ASTRONAUT TRAINING CHALLENGES, ENDING IN A VIRTUAL SCAVENGER HUNT THROUGH UND'S INFLATABLE LUNAR MARS ANALOG HABITAT.

Each activity is North Dakota standards correlated. If you are a North Dakota educator and would like copies of educator and student guides, along with a set of NASA posters sent to your classroom, please contact the NDSGC team.

TINYURL.COM/
NDSGCESCAPE



Plant the Moon/Mars

Educators, represent North Dakota in an agricultural-based STEM competition. You and your team will be challenged to grow plants in lunar or Martian simulant!

Plant the Moon/Mars

In the spring of 2023, the North Dakota Space Grant Consortium sent out 48 Plant the Moon/Mars regolith activity packs, allowing over 400 North Dakota K-12 students to participate in the Institute of Competition Science's "Plant the Moon Challenge". This agricultural based challenge asks students and their mentors to grow plants in lunar and Mars regolith- soil from Mars and the Moon that has been re-created in a lab.

Don't forget to subscribe to the NDSGC electronic mailing list to receive updates pertaining to the Plant the Moon Challenge, and more!



LEARN MORE AND APPLY FOR FUNDING

<https://plantthemoon.com/challenge/7595152/>



FROM UND TODAY:
ACCESSIBILITY IN ORBIT
 July 25, 2023 | by Walter Criswell



UND-based North Dakota Space Grant Consortium brings educators to Johns Hopkins for 'Space Science accessibility' workshop

Last year, UND's John D. Odegard School for Aerospace Sciences hosted the first Innovative Differentiated Exploration Activities in Space Science (IDEAS) workshop, a partnership between the North Dakota Space Grant Consortium (NDSGC), consortia from North and South Carolina, and members of the Johns Hopkins Applied Physics Laboratory.

The intention of the IDEAS Educator Professional Development Workshop is to equip K-12 and college educators with the knowledge and skills necessary to make space science possible for all students, including underrepresented populations and people with disabilities. This goal aligns with the work that NDSGC has been doing to increase diversity and accessibility in space science.

Earlier this month, members of the NDSGC traveled to Baltimore with six North Dakota educators to attend the workshop at Johns Hopkins University's Applied Physics Laboratory (APL). The comprehensive, four-day event promoted inclusivity in space science through discussions, presentations and activities.

The workshop included presentations on cutting-edge research conducted at APL such as NASA's Double Asteroid Redirection Test (DART), which last year changed the course of the asteroid Dimorphous, as well as the Dragonfly mission, which will send APL technology to explore Titan, Saturn's largest moon.

In addition, the workshop emphasized the need for accessibility in space science, offering immersive experiences that put educators in the shoes of students with disabilities. They wore goggles and headsets that limited their visual and auditory abilities as they participated in lessons and experiments.

NDSGC director Caitlin Milera said that events such as these were an important part of advancing the program's mission to increase accessibility and inclusivity in space science.

"The NDSGC is committed to DEIA and focuses on programs that center these philosophies," Milera said. "The July 2023 IDEAS event was the second iteration of this interactive workshop, which focused on accessibility and the universal design for learning..."

Read the story on UND Today!
<https://blogs.und.edu/und-today/2023/07/>



Top left: Earlier this month, 20 educators from across the country met in Baltimore to attend the IDEAS Workshop, a four day crash course on accessibility in space science.

Top right: Educators worked together to complete an activity titled 'It's Alive!', which was lead by Milera. Participants were asked to use various senses to determine if cups of sand had signs of life, in this case yeast. The activity was meant to simulate the search for hospitable soil in the solar system and instructors were asked to think of adaptations to make the activity more accessible.

Top middle: Over the four day workshop, instructors watched presentations on accessible teaching. This particular session, lead by Cass Runyon of the South Carolina Space Grant Consortium, focused on teaching students with dyslexia.

Top bottom: An educator learns about the Cadence device made by Tactile Engineering. This dynamic piece of technology communicates sensory information through tactile feedback and can be used as a computer monitor for people with visual impairments.

Photos from the Space Grant Consortium Annual Teachers Conference in Mississippi.
 Top right: pictured from left to right- Whitney Jackson, Tori McIntosh, Nathan Murray, Earnest Stephens, Caitlin Milera

EDUCATOR PROFESSIONAL Development

MISSISSIPPI SPACE GRANT CONSORTIUM ANNUAL TEACHERS CONFERENCE

In January 2023, the NDSGC Team was invited to participate as session presenters for the NASA Mississippi Space Grant Consortium's Annual Teachers Conference. Director Milera and Associate Director McIntosh traveled to Oxford, MS and led hands-on STEM investigations with the conference attendees.

Educators worked in teams to design "Bristle-Bot" Martian rovers to complete

challenges on Mars' surface. They also investigated exoplanets with a communication-based team activity, "Strange New Planet," to better understand NASA's missions in space exploration.

APL EDUCATOR WORKSHOP

20 educators from across the country met in Baltimore to attend the IDEAS Workshop, a four day crash course on accessibility in space science. **Check out the story featured in UND Today on the next page!**

"IT WAS VERY DIFFERENT FROM ANY OTHER WORKSHOP I'D PARTICIPATED IN BEFORE... IT WAS REALLY ABOUT THE COLLABORATION OF IDEAS, AND WE GOT EXPOSED TO A LOT OF INFORMATION WE MAY NOT BE USED TO IN OUR FIELDS."

— Connie Nelson, licensed special education teacher at Rolette Public School

Students and affiliates are encouraged to submit Student Success Stories to the NDSGC team.

SPACE GRANT ALUMNI SUCCESS STORIES

Where Are They Now?



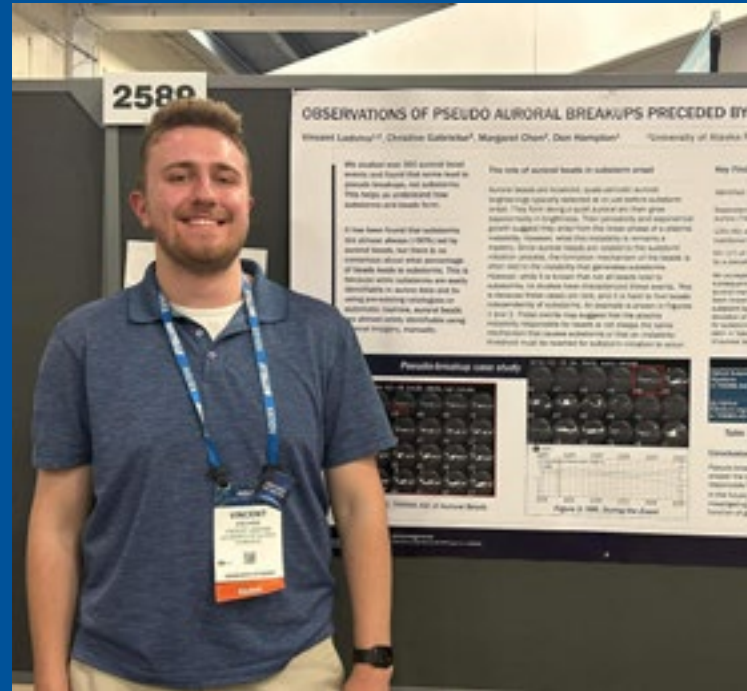
JACQUELYN EMERY

NDSGC Involvement: NDSGC STEM Ambassador 2020-2023, NDSGC STEM Ambassador of the Year 2022

Education: BS in Commercial Aviation at the University of North Dakota

Where are you now? Horizon Air in the Pacific Northwest

Advice to Students: Work hard for your dreams, but don't be afraid to change them! I never would have pictured myself where I am now when I started college, but I am grateful that I ended up where I'm at in life!



VINCE LEDVINA

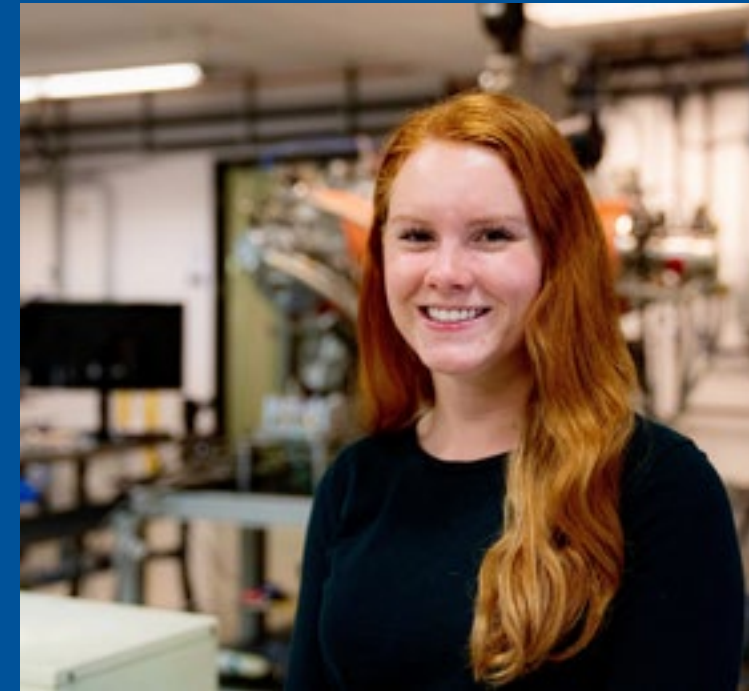
NDSGC Involvement: NDSGC Undergraduate Fellowship, 2020 and 2021, NDSGC Travel Grant 2021, NDSGC STEM Ambassador 2021-2022

Education: BS in Physics at the University of North Dakota

Where are you now? I'm a first year Ph.D. student at the University of Alaska Fairbanks in Fairbanks, Alaska. I'm funded by a 2-year NASA FINESST and 3-year NSF GRFP research fellowship and am pursuing research into auroral beads — how are these phenomena tied to auroral substorms?

I'm also working part-time at the Aerospace Corporation in El Segundo, CA, on my Thesis work and applied space weather research.

Advice to Students: My advice to students would be to seek out and take every opportunity that comes to you. Your experiences shape your future and future career.



SYDNEY MENNE

NDSGC Involvement: NASA STEM Ambassador, two NDSGC Student Research Fellowships, Pearl Young Scholarship

Education: University of North Dakota, Physics and Astrophysics, Mathematics Bachelors of Science - University of Southampton, Space Systems Engineering Master of Science

Where are you now? University of Southampton, Space Systems Engineering MSc - performing research examining the use of condensable propellants for Hall-Effect Thrusters (examining solid propellants for a spacecraft engine) - Southampton, UK

Advice to students: Take advantage of every opportunity you can! The NDSGC offers so many incredible opportunities which open many new doors and can make your dreams come true.

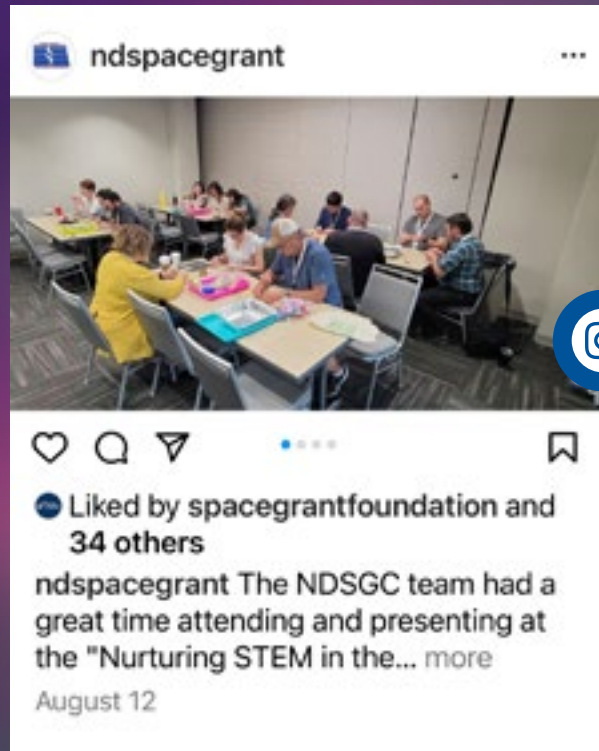


All 3 alumni featured are NDSGC-funded graduates of the University of North Dakota.

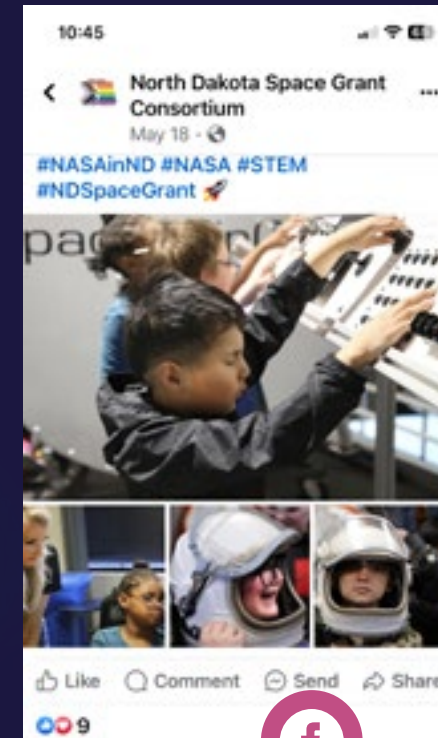
If you know of a student that should be featured in next year's "Where Are They Now?" please email the NDSGC team.

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 team had a great time attending and presenting at the 'Nurturing STEM in the PreK-12 Classroom' event on Thursday! We presented one of our lesson plans called 'Mini Martian Rovers' in which educators were able to simulate and learn what it's like for rovers on Mars to travel and collect samples of dirt for NASA to study and analyze in the future! Thank you so much to @undeducation for hosting!"
#NurturingSTEMND #NASAINND #NDSpaceGrant

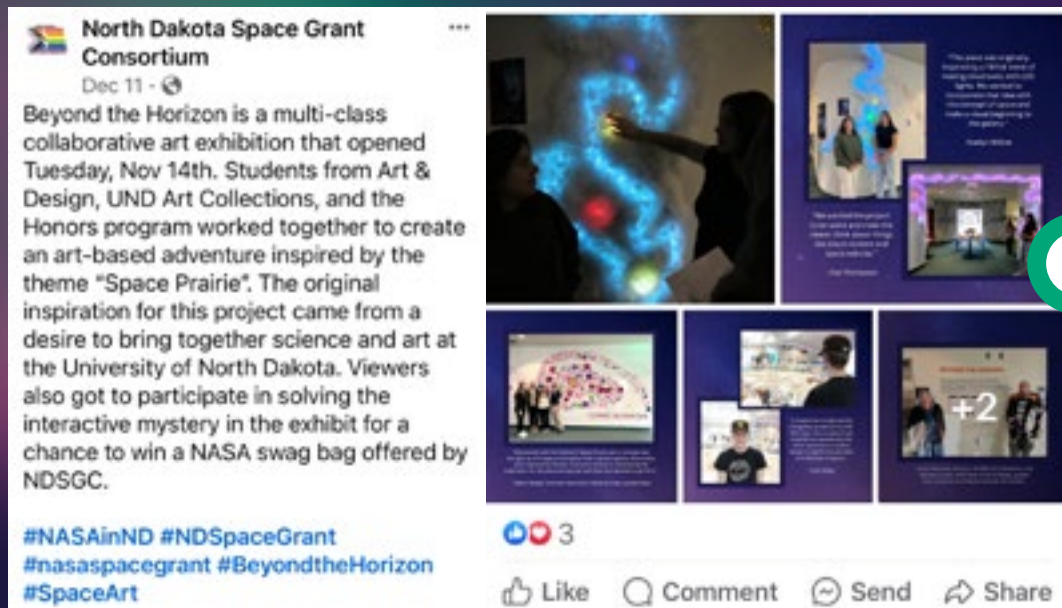


Earlier this month, NDSGC STEM Ambassadors led a tour around UND Aerospace facilities for a wonderful group of students from NDVS/SB. From feeling EVA suits in the space suit lab to touching various buttons in the space shuttle simulator bay, the kids seemed to have a blast. Please read this article, published by UND Today, for more information: <https://blogs.und.edu/und-today/2023/05/space-grant-consortium-makes-space-for-everyone/>
#NASAINND #NASA #STEM #NDSpaceGrant

A group of students from NDVS/SB had a blast on a tour around UND Aerospace facilities.
Check out the UND Today Story on pg.37!



NDSGC Associate Director Tori McIntosh, Assistant Director Laurie Salander, and STEM Ambassador Hailey Olson visited with hundreds of students at the 20th Anniversary of Career Expo - Health, Tech and Trades. They shared NASA posters along with scholarship and internship opportunities for students and mini-educator grants for teachers in North Dakota.



NDSGC offered viewers the chance to win a NASA swag bag for solving the interactive mystery of the Beyond the Horizon art exhibition.

Each summer, the NDSGC hosts an educator workshop. Don't forget to sign up for the NDSGC electronic newsletter to learn how you can become involved!

Check out the *UND Today* Story on pg.43!



North Dakota Space Grant Consortium
Jul 31 · 🌐

University of North Dakota · Follow
Jul 31 · 🌐

UND-based **North Dakota Space Grant Consortium** brings educators to Johns Hopkins for a Space Studies accessibility workshop.

#UNDproud #SpaceStudies #accessibility



blogs.und.edu
Accessibility in orbit

NASA ND Space Gr... · 6/8/23 ...
Happy #PrideMonth! The #NDSGC is committed to continued support for the LGBTQIA+ community.



June is Pride Month! The NDSGC is proud to support the LGBTQIA+ community.

Shout out to UND Aerospace Visual Communication Specialist, Heather Schuler, for designing the Pride logo for the NDSGC!

North Dakota Space Grant Consortium
Feb 18 · 🌐

Congratulations to Vincent Ledvina, an NDSGC fellow and STEM ambassador who had his Alaskan Aurora footage featured on CNN!



apple.news
'Oh my God!': Student films remarkable event in the sky — CNN



STEM Ambassador Vincent Ledvina's photography was featured on CNN.

Visit Vincent's site to see more of his work and learn about aurora chasing: <https://theauroraguy.com/>



NASA ND Space G... · 11/5/23 ...
The Plant the Moon Challenge (PTMC) Spring 2024
Registration is officially open!

Learn more at plantthemoon.com and apply at plantthemoon.com/space-grant-ap...

#NASAinND #NDSpaceGrant #nasaspacegrant #plantthemoonchallenge #STEM #stemeducation



NASA ND Space Grant
@NDSGC

The NDSGC provides funding for K-12 and collegiate students participating in STEM competitions. Applications close November 15th. First-year teams can request up to \$4,000 of funding. Returning teams up to \$12,000. Application: tinyurl.com/2023teamfunding



The NDSGC proudly supports K-12 and collegiate teams as they represent North Dakota on a national level. Competitions include NASA's Student Launch and FIRST Robotics.



Each spring the NDSGC supports teams to participate in the Institute of Competition Science's Plant the Moon Challenge. This agricultural challenge asks teams to grow plants in lunar or Mars regolith.

STAY ENGAGED WITH Space Grant



WE NEED YOU

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 explore 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

WEBSITE AND SUBMITTABLE

To view all of the active NDSGC applications, please visit our Submittable application site. This list of programs changes throughout the year and reflects open application windows.

You can find information about NDSGC opportunities on their respective web pages, at <https://ndspacegrant.und.edu>.



VIEW ACTIVE
NDSGC APPLICATIONS

ndspacegrant.submittable.com/submit

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



JOIN OUR MAILING LIST
tinyurl.com/mpncthaf



FIND THE BROCHURE ON OUR
HOMEPAGE:
<https://ndspacegrant.und.edu/index.html>



SOCIAL MEDIA

Stay up to date with North Dakota Space Grant events and happenings by following the North Dakota Space Grant on social media! <https://ndspacegrant.und.edu/about/social-media.html>



@NORTHDAKOTASPACEGRANT



@NDSGC



@NDSPACEGRANT



@NDSPACEGRANT



NORTH DAKOTA SPACE GRANT

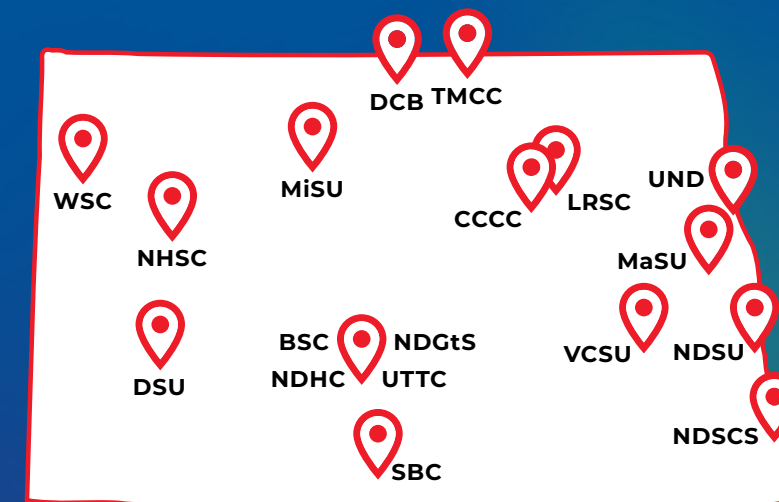


NORTH DAKOTA SPACE GRANT CONSORTIUM



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.

Thank you, also, to Heather Schuler (Visual Communication 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.



THANK YOU TO OUR AFFILIATES!



BISMARCK STATE COLLEGE



CANKDESKA CIKANA COMMUNITY COLLEGE



DAKOTA COLLEGE AT BOTTINEAU



DICKINSON STATE UNIVERSITY



ND'S 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



WILLISTON STATE COLLEGE