



Established Program to
Stimulate Competitive Research

News & Notes

January 30, 2022

From the Interim Executive Director

The Established Program to Stimulate Competitive Research (EPSCoR) through the National Science Foundation pursues a mission to enhance the research competitiveness of states, like North Dakota, by strengthening science, technology, engineering and mathematics (STEM) capacity and capability from talent development to local infrastructure.

ND EPSCoR supports STEM across the state through programs like the Rural Student Teaching Experience which provides support to middle and high school teacher candidates in rural school districts, research experiences for undergraduates at participating institutions across the state like VCSU and CCCC, and the STTAR program supporting STEM internship opportunities at companies.



Jolynne

ND EPSCoR State Conference 2023

Wednesday, March 29, 2023, at the
Fargodome in Fargo, North Dakota

Guiding to Excel

“I see myself as a guide,” said Brent Voels, Science instructor at Cankdeska Cikana Community College (CCCC) in Fort Totten, ND. “When I have a student that wants to do research, the reality is they are self-motivated. The amount of work that goes into research—to read, delve into experiments, be creative—it’s not many students that love that process of discovery.”

Students who choose to attend CCCC have the advantage of Voels’ background in cancer and molecular biology and a fully equipped molecular biology laboratory. “My biggest challenge is recruiting and retaining interested students,” he said. He commended ND EPSCoR’s Sunday Academy as one of his best recruiting strategies. Sunday Academy is designed to



generate interest in science, technology, engineering, and math (STEM) among American Indian students. Once a month during the academic year, middle- and high-school students are presented with practical day-to-day STEM problems in an informal and friendly atmosphere, requiring them to think, analyze and seek solutions. “It gives high school students a taste of what research is, and let’s them know what is possible,” Voels said. “Sunday Academy gives me a chance to interact with the students in high school and then track with them through the next two years in college.”

Although a small school, Voels stresses that CCCC and every single tribal college (TC) in the state is working on research projects. As a “fully loaded” professor (teaching 12 credits each semester), Voels ensures that students also get in-person lab experiences in addition to the many virtual labs he’s created. “We’re doing undergraduate research on par with any other PUI institution. Not only is the research novel and unique, but each student is adding to the knowledge base for science and humanity,” he added. “I tell the students that in research, they have a spoon and are needing to move a mountain. One scoop at a time, they are adding to the knowledge base, moving the mountain.”

Voels cited a mountain-moving example with a recent student, Nicholas Bittner, who had an interest in engineering but also had a background in computer-assisted design. “I talked with him about adding a biomedical component to the engineering,” Voels said. “He didn’t want to become a doctor, but the biological side of research interested him.” Voels involved Bittner in the ND-ACES project, studying cancer cell interactions on material testbeds.

Last summer, Voels arranged that Bittner could work with one of the ND-ACES cellular team members, Colin Combs, department chair and professor of Biomedical Sciences at UND School of Medicine and Health Sciences. “The goal of Bittner’s project was to mimic cell function and how they migrate,” Voels explained. With Bittner’s background in engineering and 3D printing, he was able to create a 3D prototype for real-time assessment of cell migration in a serum. Bittner’s novel chamber slide design, according to his recent poster, was effective for quantifying not only cell migration differences but visualizing cell movement. Bittner is now completing his degree at UND while continuing his work on the ND-ACES project.

“I’ve had the privilege of working with some very talented students,” Voels said. “My role is to guide—to help them discover where they can succeed, get them up and running, and on to their next level of education.”

Adding Entertainment to Science

Curiosity often is the spark that drives innovation or research. The challenge comes in connecting a young person’s curiosity or interests with an educational field or research. Two innovators at UND working on the Computational team for the ND-ACES project, along with input from three faculty, have developed YouTube videos for PROSPER that are designed to entertainingly educate. PROSPER—PROMoting Sustainable Partnerships in Education—is a group within ND-ACES that focuses, in part, on education enhancement and outreach activities.

One of the three pillars or areas of emphasis within the ND-ACES project is machine learning and computational research. By using the cyber and supercomputers at either UND or NDSU, researchers across the state can enhance their research capabilities. Aaron Bergstrom, advanced cyberinfrastructure manager, and David Apostol, senior advanced cyberinfrastructure research and education facilitator, are helping researchers to communicate their research with the broader community.



The "What is deep learning?" video defines deep learning, data sets, and neural networks

"Most researchers explain their research in scientific publications," Bergstrom said. "This is a different type of communication to a far larger audience that still conveys scientific information. It's education and entertainment together."

The target audience for these initial videos are middle school students and older. "The nice thing about animation is that there's information for many audiences," Apostol said. "It's part of broadening the impact of ND-ACES: giving students insight into what they could be studying in school, or inspiring an adult to consider a new field of study. Research is a multi-disciplinary effort: we're hoping the videos help someone see how their interests could contribute to meaningful research."

Each pillar—materials design at biointerfaces; cellular systems at material interfaces; and computation, machine learning and predictive modeling—will be featured in a video, and two of the animated videos have been completed. The first video defines deep machine learning, how objects are identified, and the multiple applications of machine learning, noted Bergstrom. The second video addresses a part of the cellular systems research. "The second topic is about an 'organoid' which is a new way to research treatment for cancer," he said. "It's a three-dimensional digital method of treating cancer, using a purple and green monster to symbolize the cancer cells."



The “What are organoids?” video discusses the 3D structure tool that provides researchers an environment where they can try out new therapeutic strategies on cancer.

“BAM Studios in Fargo usually makes commercials, so this was a new venture for them,” Bergstrom said. “They bring a fun perspective with the animation. The researchers have enjoyed the opportunity to translate and communicate their research to the general public in a way they wouldn’t ordinarily experience. It’s beneficial to the research team, and to the public.”

“One of the goals of ND-ACES is helping develop resources within North Dakota,” Apostol said. Using this ‘edu-tainment’ approach will help explain aspects of the ND-ACES research to a broader audience. In addition, it may also spur new ideas for visualizing other aspects of research. With the extensive computer capabilities at both UND and NDSU, these videos are an invitation to other researchers to use creative visualization to explain their research far beyond North Dakota’s borders.

View these videos and more on the [ND EPSCoR YouTube channel](#).

Recruiting Rural STEM Teachers

North Dakota, along with many other states, struggles to find teachers, especially those with science, technology, engineering, or math (STEM) backgrounds. At their March 2022 meeting, the North Dakota Education Standards and Practices Board declared all content areas as having a critical shortage for the 2022-2023 school year. For smaller or rural schools, the issue is more severe since they may receive fewer applications than they have openings¹.

Ryan Summers, Associate Professor of Science Education and Secondary Education Program Coordinator at UND, coordinates the Rural Student Teaching Experience (RSTE) program for the ND-ACES project. The program's goal is to provide an exceptional learning experience for teacher candidates in rural schools, while they complete their undergraduate programs.

"The experience of teaching in a smaller or rural school is very different than what a teacher might experience in a larger setting," Summers said. "But school districts are becoming more innovative in their recruiting efforts, and the RSTE program is one more avenue of support for them." The two students who will be participating in the RSTE program for the spring 2023 semester are from Mayville State and VCSU. Each will receive a stipend of up to \$10,000 during the program and receive mentorship throughout the semester.

"School districts are continuing to be more creative in their efforts to recruit teachers," Summers said. "A recent DSU graduate, Adrianna Sokolofsky, was an RSTE intern in Watford City and, thanks to the efforts of both DSU and Watford City Public Schools, she was able to transition to a full-time teaching role once her internship was completed."

Jeri Braunagel, DSU Director of Undergraduate and Graduate Field Experience in Education, noted that DSU was "very eager to coordinate with McKenzie County School District in Watford City to secure a student teaching placement for Adrianna." DSU has been instrumental in looking for ways to address the teacher education shortage in area schools, and this opportunity aligned well with ND ESPCoR's mission. Indeed, there is a close alignment as the State Board of Higher

Education currently lists K-12 teaching as a high priority for workforce development².

Watford City High School Principal Jim Green was also innovative in recruiting a much-needed teacher. “Watford City High School was very lucky to find a student-teaching candidate willing to take on a non-traditional student-teaching placement,” Green said. “This arrangement allowed us to see Adrianna in action and gave her an opportunity to move directly into employment after completing her student teaching. With a national teacher shortage and extreme difficulty finding math teachers, this was an excellent option for our school and one we may need to explore using again in the future.”

Summers said that Watford City is not the only school district exploring non-traditional recruiting efforts. Some districts have a sign-on bonus, housing arrangements, or use alternative access pathways to fill their positions, and Summers said he expects to see many districts using non-traditional methods to fill their teaching roles. The RSTE program is a much-needed support for rural schools.

[Applications for teacher candidates](#) to be in the RSTE for Fall 2023 internships are currently available on the ND EPSCoR website.

Sources

1. <https://www.nd.gov/espb/sites/www/files/documents/North-Dakota-Teacher-Shortage-Presentation.pdf>
2. <https://ndus.edu/strategic-plan/>

Rural Student Teaching Experience (RSTE)

Participants each receive a stipend of up to \$10,000 and receive mentorship while in the program

APPLY NOW!

Deadline: Noon, February 3, 2023



**Mayville State student researcher and faculty mentor
present research results at cancer conference**

(Repost from Mayville State University)

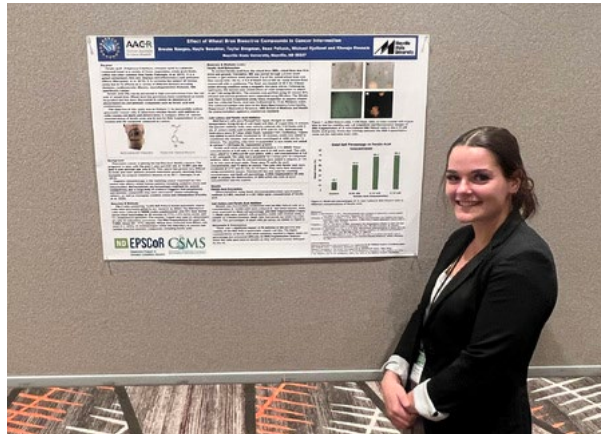
Mayville State student researcher Brooke Roeges and faculty research mentor Dr. Michael Kjelland, Assistant Professor of Biology at Mayville State, presented research results at the 12th American Association for Cancer Research (AACR) and Japanese Career Association (JCA) Joint Conference in Maui, Hawaii Dec. 10-14, 2022.

“Breakthroughs in Cancer Research - Translating Knowledge into Practice” was the conference theme.

This meeting series has a long tradition of bringing outstanding researchers from the United States, Japan, and around the world together to share their findings and present the latest advances in basic, translational, and clinical cancer research. Formal and informal interactions, as well as international collaborations, are fostered through this unique forum.

At the conference, Roeges and Dr. Kjelland gave a poster presentation, “Effect of Wheat Bran Bioactive Compounds in Pancreatic Cancer Intervention.” The poster summarized the findings of the work conducted by Mayville State student researchers Brooke Roeges, Hayle Boechler, Taylor Stegman, and Sean Pollack, along with their faculty research mentors Dr. Khwaja Hossain, Mayville State Professor of Biology, and Dr. Michael Kjelland.

[Read more >>](#)



Applications Open for STTAR Program

North Dakota businesses may now apply to be part of the Students in Technology Transfer And Research (STTAR) program.



STTAR provides opportunities for students (juniors through graduates) in science, technology, engineering, and mathematics disciplines to use their academic training and experience to address challenging science and technology-based problems faced by North Dakota companies.

The primary emphasis of STTAR is on research and development and ND EPSCoR cost-shares the student salary.

To participate, companies must demonstrate how students will make significant contributions to company performance or new product/process development using their STEM education and experience. Companies must provide at least a 1:1 cost-share, which would be a minimum salary of \$15/hour to the student.

To apply, first review the [Business Participation](#) information about eligibility, timelines, and other guidance and then complete the [Business Application Form](#) indicating how students will make a contribution to company performance, products, or processes.

With a limited number of sponsorships available, early application is encouraged. Since 2012, the ND EPSCoR State Office has partnered with 42 ND-based companies to sponsor internships for 213 postsecondary students.

Complete information is available on the [STTAR](#) page.

We're Hiring!

ND EPSCoR Executive Director

North Dakota State University (NDSU) is seeking a new Executive Director for the

North Dakota Established Program to Stimulate Competitive Research (ND EPSCoR) office. ND EPSCoR plays a vital role statewide by building research capacity, broadening participation, enhancing the research productivity, competitiveness and national recognition of North Dakota's scientists and engineers, increasing participation in STEM, research and at all stages of the educational pipeline, and advances economic development. The ND EPSCoR Executive Director's duties include supporting the Research Infrastructure Improvement (RII) Track-1 cooperative agreement and its activities and personnel as well as non-RII Track-1 statewide programming under the auspices of ND EPSCoR. NDSU, a Carnegie R1 "doctoral very high research activity" university, serves as the prime for the award, partnering with fellow research university and ND University System (NDUS) member University of North Dakota, the predominantly undergraduate institutions in the NDUS system (9 institutions) and the ND Tribal College System (NDTCS; 5 institutions).

The successful hire will lead and participate in building the state office and help facilitate and build existing relationships with state partners. The new Executive Director will support the current project, and help guide the new State Science and Technology Plan (building on important work done by the ND EPSCoR State Steering Committee) and the development of the new RII Track-1 proposal with anticipated submission in Summer 2024. With strong state support and recent legislating indicating EPSCoR jurisdictions remain a high priority in the federal context, this is a rare opportunity to leverage strong support from multiple sources. We are especially interested in candidates with exceptional relationship-building and listening skills; a robust record of equitable partnerships with Tribal Colleges and Universities; and excellent strengths in communication within and across groups with differing expertise and priorities. This job is not a remote or hybrid position and does require some travel.

<https://t.co/cuRIMpyY08>

ND EPSCoR Director of Tribal Partnerships

ND EPSCoR Communication Specialist

The search committees are finishing their work and will present candidates for interview. Watch for more information soon.

Upcoming Events

- **ND EPSCoR 2023 State Conference**
Wednesday, March 29, 2023, at FargoDome, Fargo ND

RII Track-4: EPSCoR Research Fellows Information Sessions

The Established Program to Stimulate Competitive Research (EPSCoR) is hosting virtual office hours to share information about the Research Infrastructure Improvement (RII) Track-4: EPSCoR Research Fellows solicitation [NSF 23-535](#). This opportunity provides awards to build research capacity and transform the career trajectories of non-tenured and tenured investigators through extended collaboration trips to the nation's premier private, governmental, or academic research centers.



This solicitation offers two tracks - RII Track-4:NSF and RII Track 4:@NASA. While they are similar in achieving the same goals, RII Track-4:NSF is open to a broad community, and RII Track-4:@NASA focuses on PIs from specific institutions of higher education with high enrollments of trainees from underrepresented populations in STEM (See the solicitation more details) to collaborate specifically with researchers at NASA's participating research centers.

NSF EPSCoR will host multiple office hour sessions where PIs may meet with program officers to address questions and / or seek clarification. Please submit questions in advance to cwhitley@nsf.gov

Office Hour Dates—all times at 2:00PM ET

- Thursday, February 2
- Friday, February 17
- Thursday, March 2
- Friday, March 17

- Thursday, March 30

While real time captioning will be available, requests for additional accommodations may be sent to cwhitley@nsf.gov 14 days in advance.

Register to attend one or more of the sessions here:

https://nsf.zoomgov.com/webinar/register/WN_ttChdLcOSyS8gWf35b6TYg

After registering, you will receive a confirmation email containing information about joining the webinar.

Bringing a New Product Idea to Market

February 8, 2023, 5:00-6:00pm

Do you have ideas for new products and/or processes? This free virtual Rural Innovation Series workshop by presenters Evan and Ganya Anderson is about the topics of Idea Generation, Clarification and Prioritization.

The Process

- Concept & sketch
- Iterative prototyping/testing
- Elements of great design
- Finding the best path to market
- 8 keys for the inventor

The Reality

- The good
- The bad
- The ugly

The Resources

- Where to find help along the way

[Learn more and register >>](#)

SBIR/STTR: Federal Funding for Your Innovative Idea

February 21, 2023, 5:00-6:00pm

Find out how the government's Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs can provide a source of R&D funding between the initial development of your innovative idea and proof that it has potential in the marketplace. The two programs make over \$4 billion in high-risk, non-dilutive capital available to innovative small companies annually!



This virtual event held by the Jamestown Regional Entrepreneur Center will discuss what it takes to participate and to be competitive in the programs. This training is designed to provide enough information for attendees to determine if they would like to seriously pursue proposal development and will provide the tools to help begin the process, including:

- Eligibility requirements
- Participating agencies
- The differences between SBIR and STTR
- How SBIR/STTR works with other funding
- Common misconceptions and more!

Who should attend:

- Companies from startups up to those with 500 employees who do early-stage technical R&D
- Academics who want to commercialize their technologies
- Companies who are seeking early stage, non-dilutive funding for research work

[Learn more and register >>](#)

NDSU CCAST Advanced Research Computing Training Program

These FREE training workshops are offered by NDSU CCAST. Pre-registration is required.

The NDSU Center for Computationally Assisted Science and Technology ([CCAST](#)) is offering a workshop series to introduce advanced research computing to faculty, staff, and students at NDSU and beyond. This series aims to provide researchers with basic knowledge and hands-on skills that help them make the best use of local and national high-performance computing (HPC) facilities, and ultimately to advance their research capabilities.

The training events, offered on **Friday** from **2:00-4:00 p.m.** both in person (in NDSU's QBB 132) and via Zoom, will include lectures, demonstrations, and hands-on sessions where participants have opportunities to perform simple and not-so-simple tasks on CCAST's HPC systems.

While there are no prerequisites except a strong willingness to learn, some familiarity with computer programming and Linux shell scripting would be helpful.

Spring 2023 Schedule

Five (5) core training workshops

February 3: Introduction to high-performance computing (HPC)

Basics of HPC, computer clusters, parallel computing, HPC resources at NDSU and elsewhere, access to CCAST's HPC systems

February 10: Linux for HPC: Working with Linux-based HPC systems

Basics of UNIX/Linux, job scheduler, queue policies, running and monitoring jobs on HPC systems

February 17: Linux for HPC: Text processing and shell scripting

Linux utilities for searching texts and manipulating text files, Bash shell scripting to automate tasks

February 24: How to get your work done faster? Parallel computing

Parallel programming models, work distribution among CPU cores, parallel scaling performance, tips on running parallel jobs

March 3: Accelerated computing with GPUs

Basics of graphics processing units (GPUs) and GPU programming, running scientific applications on GPU compute nodes

Four (4) special training workshops**March 24: Running Python on HPC systems**

Running Python codes on HPC systems; available Python versions and where to find them; creating custom Python environments and installing packages; integrating with Jupyter Notebook

March 31: HPC for machine learning and big data

Basics of machine learning and big data; running TensorFlow, Keras, Spark, etc. on CPU/GPU compute nodes

April 14: HPC for bioinformatics

Running popular bioinformatics tools using the batch scheduler; examples will include a basic workflow for mapping high-throughput sequencing reads; Singularity containers

April 28: Introduction to quantum computing

Basics of quantum computing, HPC/quantum computing, quantum simulations on HPC systems

The training is FREE; however, pre-registration is required. Please **register by January 31, 2023**.

Attending all the core training workshops is strongly recommended if you are new to HPC and/or CCAST as basic HPC and Linux knowledge and skills to follow the special workshops is expected.

University of Oregon Department of Linguistics

Research Experience for Undergraduates

Linguistics REU Site: Increasing American Indian/Alaska Native Perspectives in Field and Experimental Linguistics

Date: June 12 — Aug 4, 2023

Do you love languages and STEM? This research program is designed to introduce you to the discipline of linguistics with hands-on research experience that is meaningful both culturally and professionally.

BENEFITS

- Receive introductory courses in linguistics at the University of Oregon.
- Engage in linguistic analysis and lab-based research experience.
- Attend workshops on careers in STEM, work-school-life management, applying for graduate school, and much more!
- The program will fund travel, on-campus housing, and a weekly stipend.

ELIGIBILITY

- This program is open to students who are US citizens or permanent residents and identify as (or have a family/cultural connection with) Native American/Alaska Native peoples.
- Applicants must have at least one semester/term of undergraduate coursework remaining after participation in the program.
- No Minimum GPA required.

EXTENDED DEADLINE! Applications are due by 5:00 pm (PST) on January 31, 2023. Visit our website via the link below for more information about the program and application process!

This program is funded by the National Science Foundation, and hosted by the Department of Linguistics, University of Oregon, which is located on Kalapuya Ilihi, the traditional homeland of the Kalapuya people.



 **Apply Now**
blog.uoregon.edu/reuling



American Rescue Plan: Humanities Grants for Native Cultural Institutions

SECOND ROUND FUNDING NOW AVAILABLE - DEADLINE TO APPLY IS FEBRUARY 10

The National Endowment for the Humanities has awarded ATALM an additional \$500,000 in funding to support a second round of grants to Native cultural institutions. These



are short-term grants to help tribal organizations and their partners recover from the COVID-19 pandemic and provide humanities programming to their communities.

Round One of the ATALM-NEH Grant Program awarded \$3.26 million in funding to 84 tribal institutions representing 25 states. With the additional funding for Round Two, ATALM anticipates awarding up to 25 more subgrants to Native cultural institutions and their partners. Eligible entities include federally recognized tribal governments with cultural institutions, tribal cultural facilities with non-profit status, non-tribal cultural institutions working in partnership with tribes, and higher education institutions working in partnership with tribes.

[Applications](#) are due Friday, February 10.

Have questions, ideas, or suggestions for News and Notes?

[Contact Us](#)



Acknowledgement

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