



Established Program to  
Stimulate Competitive Research

## News & Notes

May 31, 2023

### From the Executive Director

Hello,

I am excited to announce that Sheridan McNeil (*Oyate Ohowicada Win*) will be joining ND EPSCoR as the Director of Tribal Partnerships in June. Sheridan's deep connections to her culture along with her passion for community and education is apparent in everything she does. I look forward to working with Sheridan as we continue to strengthen existing relationships and build additional connections with Tribal Colleges and communities.



The National Science Foundation EPSCoR PI Meeting was held this past month. I joined NDSU VPR Colleen Fitzgerald (ND-ACES PI) and UND VPR John Mihelich (ND-ACES Co-PI) for the two-day event. We learned about new programs offered by NSF and had the opportunity to network with other jurisdictions.

The ND EPSCoR Students in Technology Transfer (STTAR) Program started its 29th year. STTAR works with ND businesses interested in providing opportunities for internships in the areas of science, technology, engineering, and mathematics (STEM). This program is one way ND EPSCoR partners with others across the state

to broaden participation in STEM.

In this issue of News and Notes, we are starting “Meet the Researcher.” This feature provides an opportunity for people to share their research in a couple of sentences and share some things about themselves. I always find questions about first jobs inspiring because it demonstrates where hard work and a vision can lead.

Please join me in welcoming Sheridan to our team.

-Jolynne

## A message from the new ND EPSCoR Director of Tribal Partnerships Sheridan McNeil

Mitakiyapi (Hello relatives)! Sheridan McNeil, Oyate Ohwicada Win emaciyapi (My name is Respects the People Woman).

I am from Standing Rock and Sisseton Wahpeton Dakota/Lakota Oyates. I am also a descendant of White Earth Anishinaabe and Spirit Lake Dakota Oyates. My husband, Joseph McNeil, and I have four grown children and one grandson who brings so much joy to our family. Our cultural ceremonies and traditions keep me grounded and give me strength and hope each day.



I attained my degrees in education, including a master’s degree in Curriculum & Instruction, from Sitting Bull College, all while working full-time to help support my family. I have worked in the public health and education field for most of my adult life on Standing Rock. For the last seven and a half years I was with United Tribes Technical College (UTTC) as the Career & Technical Education Director and Dean of

Instruction. I am grateful to be a tribal college alumnus and to have worked in fulfilling careers in education at Sitting Bull College and UTTC. I believe education is the way we empower people and build strong, healthy, and sustainable communities and ways of life.

I am very thankful for the opportunities that tribal colleges and other educational institutions offer us and hope to give back through education and helping however I can.

I am excited to start a new journey with ND EPSCoR as the Director of Tribal Partnerships! I feel my experiences and knowledge of tribal colleges and tribal communities will help build capacity, strengthen pathways to education, and open communication to explore research opportunities that are respectful to our Indigenous nations in ND.

A priority of mine will be to nurture our accountability to one another as educational institutions, but more so out of respect for our diverse cultures and as humans. Having access to equitable opportunities and support in education is key to our future generations thriving. I am passionate about culture in education, equity, and access, and I have a deep commitment to advocate for these things. I feel these efforts will be supported with the amazing teams I will be working with. ND EPSCoR has strong partnerships with Tribal Colleges, and I hope to contribute to that growth into the future. I am very honored and thankful to have this opportunity to join the NDSU bison family and continue working with our tribal colleges and communities!

Wopida Tanka (Great gratitude)! Mitakuye Owasin (We are all related).

-Sheridan

**Fries (Ph.D.) explores machine learning at Dickinson State University**

Marcus Fries, Ph.D., mathematics department chair at Dickinson State University (DSU), and his ND-ACES students have been exploring machine learning, a subset of artificial intelligence (AI).

He has advised two ND-ACES undergraduate students and will have another student joining his lab soon. Each student focused on machine learning. Most recently, Fries and his advisee, Priyanka Davis (ND-ACES participant and Spring 2023 DSU graduate), were feature speakers at the 2023 DSU Celebration of Scholars. Thanks to her work with Fries, Davis is leaps and bounds ahead on her path to a machine learning career.



**Dr. Marcus Fries and Priyanka Davis**

Fries says this project represents how ND-ACES students distinguish themselves by acquiring knowledge and thought processes that they can apply throughout their careers.

“I have seen my students grow in several areas. They have ‘learned how to learn’ and are comfortable with not knowing but sitting in the knowledge that they know how to learn the new material that will illuminate the current problem,” explains Fries. “My students have also grown in their fundamental knowledge and how to apply that knowledge to a new problem.”

Although Davis has graduated, she and Fries will continue their AI research together.

Fries explains, “Priyanka and I are going to train a machine to identify different types of cancer and the number of days of growth. Cancer cells seem to grow in regular patterns that match a fractal type image. We will use non-natural images, especially mathematically generated fractals, to train our AI. We will then train this on the cancer cell images.”

For example, natural cancer cells develop slowly whereas machine learning allows non-natural cells to be considered without human annotation or image downloading. This expands the image database and improves predictability of what cancer cells might be. As a result, doctors have more time to develop the optimum treatment strategy.

Fries benefits from ND-ACES as a scientist.

“I appreciate how ND-ACES pushes my boundaries of my research. My Ph.D. is in linear algebra, which is a major component of machine learning algorithms. I've been able to see how my previous work interfaces with computer science,” he explains. “I also enjoy seeing the different approaches by the researchers involved in the Computational Pillar. Currently, there are at least three different approaches to the modeling problems that we are addressing as part of this NSF grant.”

Davis considers ND-ACES to be her gateway to a professional career teaching machines to make better decisions and improve efficiency, so humans have the ability to develop, grow, and apply their own thoughts and potential.

“This research program has been really beneficial because it has helped me find my passion towards machine learning! I was completely new to this topic and now I keep wanting to learn more and create a positive impact in the society from what I have learned,” says Davis. “This experience would not have been possible without the EPSCoR program and for that I am forever grateful.”

## **Summer internships have begun!**

### **Students in Technology Transfer and Research (STTAR)**

The ND EPSCoR State Office established the STTAR program in 1994 in response to recognized state and national needs for increased technology transfer from universities to industry. STTAR is a North Dakota University System University-Industry Technology Transfer Program. Since STTAR began, dozens of North Dakota companies have participated in this highly successful program aimed at developing the workforce. All businesses working on STEM projects are eligible to apply.

North Dakota University System students, North Dakota residents enrolled at other colleges and universities, and students enrolled at tribal colleges in North Dakota are eligible for STTAR participation and to work with North Dakota businesses for a minimum of eight (8) weeks during summer months. Internships for 2023 have begun and a few more positions will be finalized soon.

Future issues of News and Notes will provide additional details about the 2023 STTAR program.

## Meet the Researcher



**Amanda Haage, Ph.D.**

Professor of Anatomy and Cell Biology

UND School of Medicine

### **What are your primary research and scholarly interests?**

I have consistently been interested in how cells sense and respond to their surroundings. I started in my Ph.D. looking at the response side of things in how cells activate enzymes responsible for rearranging the extracellular matrix and shifted to the sensing side of things in my post-doc working on proteins traditionally involved in cell to extracellular matrix adhesion. I have continued this primary interest in my own lab at UND primarily in the context of cancer cell metastasis and how a balance of cell adhesion (sticky enough, but not too stuck) regulates how cancer cells move.

### **How does this tie into the work you are doing with ND-ACES?**

I am in the Cellular Pillar and throughout my career I have worked alongside engineers in characterizing novel scaffolds or hydrogels that allow us to better model the human body. Cells in traditional 2D culture are a marvel of the 20th century, but the next jump to be made is being able to look at things in 3D and in environments that more closely mimic the body, particularly in physical properties – we're not made of glass or hard plastic!

### **Where are you from and where did you pursue your education?**

I grew up in eastern Iowa. I did my BA at Wartburg College, my Ph.D. at Iowa State University, and my post-doctoral training at the University of British Columbia.

**What motivates you?**

I am motivated by a passion for lifelong learning. The joy of acquiring new knowledge and skills, exploring diverse subjects, and staying adaptable in a changing world fuels my drive. Lifelong learning empowers me to contribute meaningfully, collaborate effectively, and embrace new challenges. It provides a sense of fulfillment, personal growth, and the opportunity to make a positive impact in both my personal and professional life.

**What was your first job?**

I worked at a gas station making pizzas.

**What does your very best day include?**

Currently, a beverage on my back porch while grilling with my dogs.

**What's your favorite quote?**

"The best way to predict the future is to create it." – Peter Drucker

## Meet the Researcher



**Selvakumar Prakash Parthiban, Ph.D.**

Assistant Professor

NDSU Department of Mechanical Engineering



**What are your primary research and scholarly interests?**

I am interested in engineering blood vessels on all length scales. Applying engineering principles to fabricate dense functional blood vessels in a thick synthetic tissue is an unsolved problem, and my group has taken up this intellectual challenge.

**How does this tie into the work you are doing with ND-ACES?**

I am working with the Materials Pillar of the Center for Cellular Biointerfaces in Science and Engineering (CCBSE). My expertise lends hands to vascularize cancer test bed materials, thereby, better mimicking the native extracellular matrix environment encountered by the cells.

**Where are you from and where did you pursue your education?**

I am from India and got my bachelor's and master's degrees from the University of Madras, India. My Ph.D. is from Nagoya University, Japan.

**What motivates you?**

From a teaching perspective, finding new ways to present a concept to the students motivates me to teach. On the research perspective, the fact that scientists could not engineer a thick vascularized synthetic tissue more than a few millimeters thick baffles and motivates me to find new ways to do research in tissue engineering.

**What was your first job?**

Proofreader - English books and journals

**What does your very best day include?**

One where I can come up with a working hypothesis on a research problem and design relevant experiments around it.

**What's your favorite quote?**

"Study hard what interest you the most in the most undisciplined, irreverent, and original manner possible." – Richard Feynman



## **Registration is now open!**

### **2023 Spring NSF Grants Conference**

The National Science Foundation (NSF) will be hosting the Spring 2023 NSF Virtual Grants Conference from June 5 – 8, 2023. Registration is now open!

The NSF Grants Conference is designed to give new faculty, researchers, and administrators key insights into a wide range of current issues at NSF. NSF staff will provide up-to-date information about policies and procedures, specific funding opportunities, and answer attendee questions.

Highlights include:

- New programs and initiatives
- Proposal preparation
- NSF's merit review process
- NSF directorate sessions
- Award management topics
- Conflict of interest policies
- NSF systems updates

NSF encourages attendees to submit questions for the speakers in advance. If you would like to do so, please click “Submit Questions” on the registration page.

For those who cannot attend the live conference, all recorded conference sessions will be available on-demand shortly after the event.

[Registration page and details.](#)

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## Update on positions

- ND EPSCoR Administrative Coordinator  
[Learn more](#)
  - ND EPSCoR Director of Tribal Partnerships  
Sheridan McNeil starts in this role June 5, 2023
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See our latest video in the STEM Activities at Home series!

### Bernoulli's Principle



## Funding Opportunities

- Dept. of the Army – USAMRAA  
[DoD Breast Cancer, Clinical Research Extension Award](#)  
Deadline: Jun 22, 2023
- Dept. of the Army – USAMRAAT  
[DoD Breast Cancer, Breakthrough Award Level 3](#)  
Deadline: Jun 28, 2023
- Dept. of the Army – USAMRAA  
[DoD Breast Cancer, Innovator Award](#)  
Deadline: Jun 28, 2023
- Dept. of the Army – USAMRAA  
[DoD Breast Cancer, Transformative Breast Cancer Consortium Award](#)  
Deadline: Jun 28, 2023
- Department of the Interior  
[National Land Remote Sensing Education Outreach and Research Activity \(NLRSEORA\)](#)  
Deadline: Jul 19, 2023
- Dept. of the Army – USAMRAA DoD  
[DOD Prostate Cancer, Early Investigator Research Award](#)  
Deadline: Aug 24, 2023
- Dept. of the Army – USAMRAA  
[DoD Prostate Cancer, Data Science Award](#)  
Deadline: Aug 24, 2023
- Dept. of the Army – USAMRAA  
[DoD Prostate Cancer, Health Disparity Research Award](#)  
Deadline: Aug 24, 2023

- Dept. of the Army – USAMRAA  
[DoD Prostate Cancer, Health Disparity Research Award](#)  
Deadline: Aug 24, 2023
- Dept. of the Army – USAMRAA  
[DoD Melanoma Focused Program Award Rare Melanomas](#)  
Deadline: Sep 22, 2023
- Dept. of the Army – USAMRAA  
[DoD Prostate Cancer, Idea Development Award](#)  
Deadline: Oct 5, 2023
- Dept. of the Army – USAMRAA  
[DOD Pancreatic Cancer, Translational Research Partnership Award](#)  
Deadline: Oct 5, 2023
- Department of Health and Human Services  
[Cancer Tissue Engineering Collaborative: Enabling Biomimetic Tissue-Engineered Technologies for Cancer Research \(R01 Clinical Trial Optional\)](#)  
Deadline: May 7, 2025

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

[\*\*Contact Us\*\*](#)

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#### *Acknowledgement*

*Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.*