

March 4, 2024

Empowering Mathematics: Jessica Striker's research and outreach in algebraic combinatorics

Jessica Striker, NDSU professor of mathematics, spoke recently on campus at a Women in Research luncheon about her work that's funded by a grant of \$384,623 from the National Science Foundation (NSF) to conduct research in a branch of math called algebraic combinatorics. The award supports research from Striker and her team across three projects.

Algebraic combinatorics involves determining patterns and relationships in shapes and structures that exist in spaces with more than two dimensions.

In the first project, the researchers are exploring how systems change and evolve over time. They are looking at how different actions impact the paths of objects and have uncovered a connection between two mathematical ideas: promotion on P-strict labelings and rowmotion on B-bounded P-partitions. This implications of this connection are important because it will help expand our understanding of how we count and arrange objects in complex situations and with



a wide variety of objects.

In the second project, Striker is addressing a longstanding challenge involving alternating sign matrices, which are mathematical structures with similarities to the square ice model in physics. She is attempting to establish links between these structures and another mathematical concept known as totally symmetric self-complementary plane partitions.

The third project involves making special tools, called sl_4 -web bases, for four-row rectangular diagrams. These tools will help researchers understand how elements can be arranged, especially in diagrams with four rows. Quantum link theories and cluster algebras (which help explain complex geometric and algebraic structures) will be able to utilize these tools.

The grant also supports the development of SageMath open-source software. SageMath is a powerful tool for mathematical computation and visualization, and Striker will make the code related to her research available and train others in SageMath coding for combinatorics research. These contributions will enhance SageMath's capabilities in algebraic combinatorics and related fields.

Striker's grant prioritizes broader impacts and aims to foster mentorship, diversity, and outreach in mathematics and supports efforts to increase the representation of women and North Dakotans in mathematics. While Striker is currently engaged in K-12 student outreach and has already developed materials and visited classrooms to inspire the next generation of mathematicians, the grant will further enable these efforts. It will also include the establishment of a Math Exploration Camp for high school students and a book of combinatorics activities.



"Dr. Striker's project showcases the way excellent research and outreach can be

intertwined successfully and is a noteworthy example of the type of value our NDSU researchers provide to the state," said Colleen Fitzgerald, NDSU vice president for research and creative activity. "By sharing and promoting her unique accomplishments in mathematics, she's serving as a role model for women and youth in our state and truly living out NDSU's land-grant mission."

Striker's research is supported by the National Science Foundation, award [2247089](#)

Open forum: University Attending Veterinarian/Director of Animal Resources

The Search Committee for the University Attending Veterinarian/Director of Animal Resources invites you to participate in an open forum for: **Rebecca Erickson, DVM, DACLAM.**

Dr. Erickson is a senior clinical veterinarian at the Center for Comparative Medicine and a research assistant professor in the department of pathology at Northwestern University.

Dr. Erickson will give a 20-minute presentation addressing "What do you envision a successful animal research program at NDSU looking like, and what is the role of the AV/Director of Animal Resources in attaining this vision?" Her presentation will be followed by a 20-minute question-and-answer session.

Monday, March 11th at 2:00 p.m., Morrill 105 or [via Zoom](#)

The Attending Veterinarian reports to the Vice President for RCA and serves as a resource to faculty, staff, and students by providing regulatory guidance and veterinary expertise to those utilizing animals in research, teaching, and/or production. The Attending Veterinarian is a critical component of ensuring compliance with USDA and PHS guidelines. The AV works closely with the Animal

Care and Use Committee and partners with departments across campus to maintain the highest standards of animal care and use at NDSU.

- **Review the University Attending Veterinarian/Director of Animal Resources [position description](#).**
- **Read Dr. Erickson's [cover letter and resume](#)**

Exploring Paths to Research Leadership Seminar Series

There's still time to sign up for the first session on March 14

As part of her RCA Broadening Participation Faculty Fellow role, [Febina Mathew](#), NDSU associate professor of plant pathology, has created the Exploring Paths to Research Leadership pilot program. These sessions will enable participants to explore different paths to research leadership.



How Can I Effectively Lead my Research Program?

As a researcher, it is common to feel overwhelmed by data and underestimate your expertise in your field. However, effective communication and engagement with your work are crucial for establishing yourself as an expert. In this session, we will provide you with tips to help you gain recognition in your respective field.

- March 14, Nueta (MU), 11:30 AM to 1 PM
- Speakers: Febina Mathew and Julia Bowsher

Sessions are free, but registration is required. Lunch will be provided at each session.

[Learn more and register >>](#)



2024 North Dakota Water Resources Research Institute (NDWRRI) Fellowship Program

All NDSU and UND graduate students studying in water resources areas are invited to apply for the 2024 NDWRRI Fellowship Program. Applicants must be a current NDSU or UND graduate student conducting thesis/dissertation research in water resources areas. Recipients of a 2023 NDWRRI fellowship may apply for continuous funding in 2024.

**Applications must be submitted electronically to Xinhua.Jia@ndsu.edu
by 5:00 PM on April 5, 2024**

[Learn more and apply >>](#)

North Dakota State University 2024 Summer Undergraduate Biomedical Research Program

NDSU is offering a summer undergraduate research program featuring the

opportunity to study biomedical research within a variety of science and engineering fields. This program is intended to provide a coordinated, educational and dynamic research community to encourage research in undergraduate study.

There are 19 research projects to select from, including research areas in different STEM departments.

WHERE	The North Dakota State University campus in Fargo, ND.
WHEN	Projects will run for 10 weeks from May 28, 2024 to August 2, 2024.
WHO	Undergraduate students who are currently enrolled in a degree program at a North Dakota college or university and who will not graduate before December 2024.
PAY / MATERIALS	Wages of \$15 per hour. Students are expected to work 40 hours per week. Funds (up to \$500) to purchase consumable research materials by your advisor.
QUESTIONS	Contact Kirstin Saulsbury

[*Learn more and apply >>*](#)

Applications and two reference letters must be received by March 15, 2024

This program is supported by an Institutional Development Award (IDeA) from the National Institute of General Medical Sciences of the National Institutes of Health under grant number P20GM103442.

north dakota  state university



save the dates

april 9 + 10, 2024

Call for Evaluators for Student Research Days

Evaluators are needed for both days for NDSU Student Research Days -- a two-day event dedicated to providing NDSU graduate and undergraduate students an opportunity to present their research and creative works. Scheduled for April 9-10, 2024, Student Research Days is a collaboration among NDSU EXPLORE, Gamma Sigma Delta, and the Graduate Student Council.

Student Research Day 2024 evaluator opportunities

1. [Sign up to be an evaluator for NDSU EXPLORE](#)
2. [Sign up to be an evaluator for Gamma Sigma Delta](#)
3. [Sign up to be an evaluator for Graduate Student Council](#)

**Call for internal proposals:
Pilot Grants: NASA EPSCoR**

RCA is seeking internal proposals for NASA pilot projects of up to \$50,000.



Deadline to apply is COB, April 1, 2024

[Learn more and apply >>](#)

**NSF Proposal & Award Policies & Procedures Guide revised
-- webinar to be held on March 12**

The National Science Foundation (NSF) has announced that a revised version of the **NSF Proposal & Award Policies & Procedures Guide (PAPPG) (NSF 24-1)** has been issued. The new PAPPG will be effective for proposals submitted or due on or after May 20, 2024. While this version of the PAPPG becomes effective on May 20, 2024, in the interim, the guidelines contained in the current **PAPPG (NSF 23-1)** continue to apply.



NSF will present information about these changes in a webinar — **Updates to the NSF Proposal and Award Policies and Procedures Guide (PAPPG) (NSF 24-1)** on

Tuesday, March 12, from 2:00 – 3:00 PM EST. There is no cost to participate. The webinar will cover changes and clarifications to the PAPPG which will be effective for proposals submitted or due on or after May 20, 2024.

A by-chapter [Summary of Changes](#) provides a quick overview of the changes to this PAPPG (NSF 24-1). Questions prior to the webinar should be sent to grants_conference@nsf.gov.

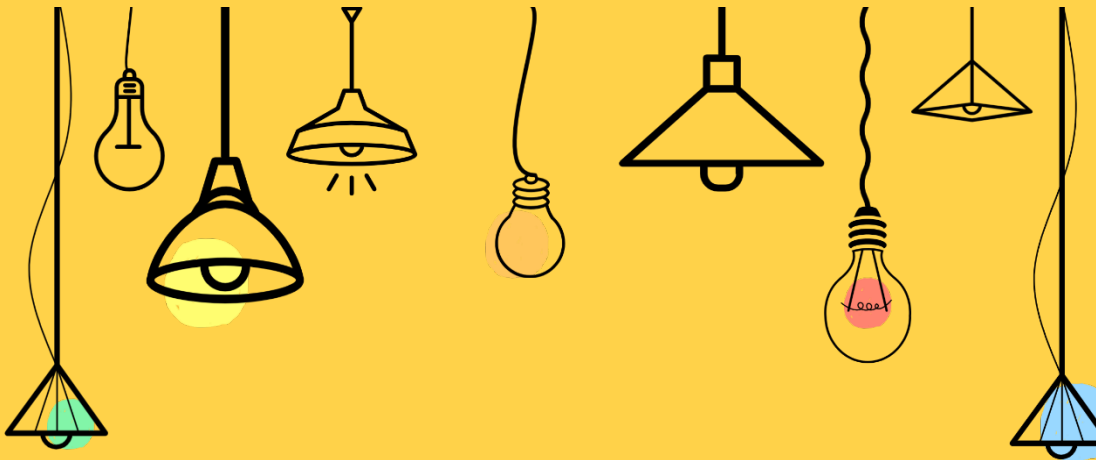
[Learn more and register >>](#)



SciENcv individual or small group sessions available

NSF now requires the use of [SciENcv](#) to generate your **BioSketch** and **Current and Pending Support** documents for *ALL* grant applications.

If you haven't already managed to login and create a needed biosketch and current and pending support, and you would like some assistance, please reach out to ndsu.researchdev@ndsu.edu to set up a session! We will accommodate in-person and zoom.



Have a big, bright idea about research at NDSU?

It's important that we continually challenge each other to come up with ambitious, big ideas in our research endeavors at NDSU. So we'd like to hear your ideas, and the bigger they are, the better.

While we can't promise all of them will succeed, we welcome you to share them - from an early concept or thought all the way to developed ideas that may just need some collaboration - send us an email (bigideas@ndsu.edu) and get the process started.

Upcoming Events at a Glance

- **Save the Date: NIH National Institute of Nursing Research Director's Lecture – Climate Change and Health**
March 6 | 11-12p | [Register >>](#)
- **Updates to the NSF Proposal and Award Policies and Procedures Guide (PAPPG) (NSF 24-1)**
March 12, 1-2pm | [Register >>](#)

- **Exploring Paths to Research Leadership Seminar Series**
March 14, March 28, April 5, April 12 | [Learn more and register >>](#)
- **Student Research Days**
April 9 and 10 | [Learn more >>](#)

Funding Opportunities

QUICK LINKS



National Institutes
of Health

NIH Grant Funding



NSF Grant Funding



DoD Grant Funding

AGRICULTURE AND ANIMAL SCIENCES

- **FFAR: The Greener Cattle Initiative**
The Greener Cattle Initiative is a consortium of stakeholders who share knowledge, leverage investments and accelerate research to identify, develop and/or validate scientifically sound, commercially feasible and socially responsible practices and technologies that reduce enteric methane emissions from dairy and beef cattle to slow the effects of climate change.
[Learn more and Apply >>](#)
Deadline: Pre-applications April 3, 2024
- **USDA: 2024 Norman E. Borlaug International Agricultural Science Technology Fellowship Program**
Since 2004, the U.S. Congress has made funds available to the Borlaug Fellowship Program to advance USDA/FAS's agricultural research goals of promoting collaborative programs among agricultural professionals of eligible countries, agricultural professionals of the United States, the international agricultural

research system, and United States entities conducting research by providing Fellowships to individuals from eligible countries who specialize or have experience in agricultural education, research, extension, or other related fields.

[Learn more and Apply >](#)

Deadline: April 8, 2024

HEALTH AND HUMAN DEVELOPMENT

- **Advancing Cell-Free Systems Toward Increased Range of Use-Inspired Applications (CFIRE)**

A nascent industry has formed around the ability to carry out biochemical processes, such as DNA transcription/translation, in cell-free in-vitro systems instead of in traditional cell-based in-vivo bio-reactors. This approach has a number of potential advantages, including rapid turn-around, distributed and highly retargetable manufacturing, high-fidelity instrumentation and control of the manufacturing environments – without the constraints of biological growth and the interference caused by cell biomass and cell membranes during product purification. Furthermore, cell-free systems can produce products that are challenging to manufacture in cell-based cultures, such as those inherently toxic to cells or hydrocarbon products that are consumed by the cellular machinery. The *Advancing Cell-Free Systems Toward Increased Range of Use-Inspired Applications (CFIRE)* initiative will accelerate the adoption of cell-free systems, enable new applications of this technology and contribute to the growth of the U.S. bioeconomy.

[Learn more and Apply >>](#)

Deadlines:

September 20 2024 (preliminary proposal required May 17, 2024)

- **NIH: Developing Digital Therapeutics for Substance Use Disorders**

The purpose of this notice of funding opportunity (NOFO) is to accelerate the development of Digital Therapeutics (DTx) to treat Substance Use Disorders (SUDs). Advances in technology offer unprecedented opportunities to develop clinical-grade mobile, web, or other software-based platforms designed to deliver treatments that are safe and effective for SUD.

[Learn more and Apply >>](#)

Deadline: LOI June 17, 2024

- **Daiichi Sankyo: Bifunctional small molecule compound technology that modulates protein-protein interactions PPI**

Daiichi Sankyo is looking for bifunctional small molecules that can inhibit target protein function through protein-protein interactions (PPI). They are also looking for a methodology for rationally designing such bifunctional compounds based on protein structural information.

[Learn more and apply >>](#)

Deadline: March 31, 2024

- **NIJ: Research and Evaluation on School Safety**

With this solicitation, NIJ, in collaboration with the Bureau of Justice Assistance, seeks applications for funding rigorous research and evaluation projects to fill knowledge gaps in two topical areas: 1) studies on the root causes and consequences of school violence and 2) examinations of the impact and effectiveness of awards made for purposes authorized under the STOP School Violence Act.

[Learn more and Apply >>](#)

Deadline: May 7, 2024

- **NIH: NIA Career Transition Award**

The purpose of the NIA K22 Career Transition Award is to facilitate the transition of mentored, postdoctoral researchers to tenure-track or equivalent faculty positions conducting research that advances the [mission](#) of NIA.

[Learn more and Apply >>](#)

Deadlines: June 12, October 12, 2024...

ART, SCIENCES, AND ENGINEERING

- **DOT: Mobility Equity Research Initiative**

Through this NOFO, U.S. DOT seeks to advance research and technologies that support the Department's goal of expanding accessibility and mobility to underserved communities, including people with disabilities, older Americans, and rural and disadvantaged communities.

[Learn more and Apply >>](#)

Deadline: March 22, 2024

- **NSF: Next Era of Wireless and Spectrum**

This program seeks to develop the intellectual capital enabling the U.S. to smoothly and quickly transition to effective new ways of using and managing the radio and optical spectrum after the end of the current spectrum era of long-term exclusive-use license auctions, thereby sustaining and advancing the social, economic, scientific, and U.S. national leadership benefits derived from the electromagnetic spectrum.

[Learn more and Apply >>](#)

Deadline: May 28, 2024

- **NSF: Foundational Research in Robotics**

The Foundational Research in Robotics (FRR) program, jointly led by the CISE and ENG Directorates, supports research on robotic systems that exhibit significant levels of both computational capability and physical complexity.

[Learn more and Apply >>](#)

Deadline: Apply Anytime

- **NIH: Ensuring Research Integrity – Conferences**

This notice solicits applications for projects to plan and implement conferences on research integrity and compliance with. In-person and virtual conferences, or a combination of both, will be considered for funding.

[Learn more and Apply >>](#)

Deadline: April 11, 2024

Limited submission programs

Limited submission grant programs are those that indicate a limit on the number of proposals that may be submitted by an institution for a particular deadline. A selection process becomes necessary if more applicants express interest in applying than NDSU is allowed to submit to the grant program. Email notifications of interest to ndsu.researchdev@ndsu.edu by **close of business** on the notification deadline

date.

Review available [Limited Submission Programs](#)

Looking for more funding opportunities?



RCA subscribes to SPIN by InfoEd Global, a database of more than 40,000 funding opportunities. Through this subscription, SPIN is free for current NDSU faculty, staff, and students.

For more information and to access this database, visit the [SPIN page](#) on the RCA website. If you have questions, please contact ndsu.researchdev@ndsu.edu.

Have questions, ideas, or suggestions for the RCA Update?

[Contact Us](#)



The Office of Research and Creative Activity (RCA) sends bi-weekly emails to NDSU faculty and staff to provide current information on various topics including funding opportunities, grant program changes, research resources, deadlines, notices, and training.

You are receiving this notification through the NDSU official employee listserv or sub-list. The official listserv refreshes after each pay period.

North Dakota State University does not discriminate on the basis of age, color, disability, gender expression/identity, genetic information, marital status, national origin, public assistance status, race, religion, sex, sexual orientation, or status as a U.S. veteran. Direct inquiries to: Equal Opportunity Specialist, Old Main 201, 701-231-7708 or Title IX/ADA Coordinator, Old Main 102, 701-231-6409.

We collectively acknowledge that we gather at NDSU, a land grant institution, on the traditional lands of the Oceti Sakowin (Dakota, Lakota, Nakoda) and Anishinaabe Peoples in addition to many diverse Indigenous Peoples still connected to these lands. We honor with gratitude Mother Earth and the Indigenous Peoples who have walked with her throughout generations. We will continue to learn how to live in unity with Mother Earth and build strong, mutually beneficial, trusting relationships with Indigenous Peoples of our region.