NDSU | COLLEGE OF ENGINEERING

COLLEGE HAPPENINGS

November 15, 2022

IN THE NEWS

'There are a lot of opportunities'

NDSU grad part of NASA's Artemis I mission to get back to the moon

NDSU to offer new, in-demand software engineering major

CONGRATULATIONS

Sulaymon L. Eshkabilov, an assistant professor in the **Department of Agricultural and Biosystems Engineering**, has published a new book, *Beginning MATLAB and Simulink*. The book is a practical in-depth tutorial on MATLAB and Simulink that includes case study examples from data science and engineering.

Please let *College Happenings* know about honors, awards, new grants and other announcements so we can share them with other faculty and staff.

UPCOMING EVENTS

Tuesday, December 6, **College of Engineering Faculty Council Meeting**. The meeting will be at 12:00 pm in the Sahnish room at the Memorial Union. Lunch will be provided.

Thursday, December 15, **College of Engineering Ring and Pin Ceremony**. This ceremony is a blending of two significant and celebratory events, the Order of the Engineer and the Pledge of the Computing Professional. The ceremony begins at 5:30 pm. All Winter 2022 graduating seniors are invited to participate.

Friday, December 16, **2022 Winter Commencement**. The ceremony for the College of Engineering will be held at 2:00 p.m. at the SHAC. Faculty and staff who wish to participate in the academic processional along with our graduation class will wear caps and gowns. Register here: http://www.ndsu.edu/commencement/facstaff/

STUDENT RESEARCH DAY

NDSU Student Research Day is a collaboration among NDSU EXPLORE, Gamma Sigma Delta, and the Graduate Student Council. Join us for a one-day celebration of undergraduate and graduate student research and creative projects.

NDSU Student Research Day will be held April 18, 2023 in the Memorial Union

Watch for more information on registration and event details in early 2023.

CHANGES TO NSF PROPOSALS

The National Science Foundation has issued a revised version of the ***NSF Proposal & Award Policies & Procedures Guide*** (PAPPG) (NSF 23-1), which will take effect January 30, 2022. Among the changes introduced with this new PAPPG are the following:

- Research.gov will fully replace FastLane for proposal preparation and submission.
- Biographical Sketch and Current and Pending Support formats will include certifications from the individual (as required by the 2021 National Defense Authorization Act, Section 223) regarding information being accurate, current, and complete.
- Required use of SciENcv for the Biographical Sketch and Current and Pending Support documents (PDF templates will no longer be an option).

View the full list of changes.

FY2024 PROGRAMMATIC REQUESTS

Each year congressional delegations have the opportunity to submit programmatic funding requests for federal research programs. Programmatic requests are designed to add additional funding to federal agencies' budgets with the intent that a competitive funding opportunity will be released in connection with the funding increase.

NDSU's process for submitting requests for consideration is on the RCA website. The deadline for FY2024 submissions to RCA is December 20, 2022. If you have questions about the process or would like to discuss a potential idea, please contact ndsu.researchdev@ndsu.edu.

GRANT PROPOSAL TEMPLATE

Are you new to writing grant proposals? And not sure where to start in terms of text layout and section headings? The NDSU Office of Research and Creative Activity has prepared a basic research proposal template for you.

This template will be helpful for graduate students and faculty who are new to seeking funding for research. It's available for download on the RCA Forms page (Sponsored Programs Administration/proposal development). You will also find budget and budget justification tools on the RCA Forms page.

One last tip; always remember to review the sponsor's proposal guidelines. They are often found on their website and will detail what you need to do to apply for a potential grant.

Contact the RCA office with any questions.

FUNDING OPPORTUNITIES

DARPA: Young Faculty Award

The Defense Advanced Research Projects Agency (DARPA) Young Faculty Award (YFA) program [DARPA-RA-23-01] aims to identify and engage rising stars in junior research positions in academia and equivalent positions at non-profit research institutions, particularly those without prior DARPA funding, to expose them to Department of Defense (DoD) needs and DARPA's mission to create and prevent technological surprise. The YFA program will provide high-impact funding to elite researchers early in their careers to develop innovative new research that enables transformative DoD capabilities. Ultimately, the YFA program is developing the next generations of researchers focused on national security issues.

DARPA is soliciting innovative research proposals in the areas of interest to DARPA's six technical offices: Biological

Technologies Office (BTO), Defense Sciences Office (DSO), Information Innovation Office (I2O), Microsystems Technology Office (MTO), Strategic Technology Office (STO), and Tactical Technology Office (TTO). Proposed research should investigate innovative approaches that enable revolutionary advances in science, devices, or systems.

Executive summary deadline: November 30, 2022; 3pm

DOE RFIs: Cybersecurity and Energy in Rural Areas

The Department of Energy is requesting input on implementation of several programs:

- Energy Improvements in Rural or Remote Areas
  Response deadline: 11/28/2022; 1pm
- Improving Cybersecurity Posture of Rural and Municipal Utilities
  Response deadline: 12/19/2022

NSF DCL: Cyberinfrastructure, Data and Computation Opportunities for CMMI

This Dear Colleague Letter (DCL) [NSF 23-017] briefly summarizes three mutually supporting funding opportunities in the area of cyberinfrastructure that should be of interest to Division of Civil, Mechanical & Manufacturing Innovation (CMMI) researchers:

- Computational and Data-Enabled Science and Engineering (CDS&E)
- Cyberinfrastructure for Sustained Scientific Innovation (CSSI), and
- Training-based Workforce Development for Advanced Cyberinfrastructure (CyberTraining).

Interested readers should make sure to read the specific funding opportunities listed above for each program carefully and should contact a cognizant program officer to clarify any questions before submitting a proposal. Finally, a unified presentation of the NSF's vision for CI can be found at Transforming Science Through Cyberinfrastructure: NSF's Blueprint for a National Cyberinfrastructure Ecosystem for Science and Engineering in the 21st Century, which we believe will be of interest to many CMMI researchers.

RECENTLY FUNDED GRANTS

- Kelly Ann Rusch (PI). NSF INCLUDES Alliance: Cultivating Indigenous Research Communities for Leadership in Education and STEM (CIRCLES) Alliance. $759,703 from the National Science Foundation. 8/15/2022 – 7/31/2024.
- Kenneth Hellevang (PI). Evaluating the Allowable Storage Time of Selected Soybean Varieties. $126,480 from the United Soybean Board. 10/1/2022 - 12/31/2023.
- Joao Paulo Cassol Flores (CPI). Harnessing Data for Accurate Yield and Oil Content Prediction. $75,900 from the National Institute of Food & Agriculture. 6/15/2022 – 6/14/2023.

RECENTLY SUBMITTED PROPOSALS

- Sulaymon Eshkabilov (PI), Ewumbua Monono (CPI), Omid Beik (CPI), Christopher Whitsel (CPI), David Ripplinger (CPI). Societal Implications Of Clean Energy Tractors For Farming. $650,000 from the National Institute of Food & Agriculture. 7/1/2023 - 6/30/2027.
- Abdulaziz Ali H Banawi (PI), Ying Huang (CPI), Zhili Gao (CPI), Eric Asa (CPI), Yao Yu (CPI), Grant Lebahn (CPI). BUILDING INFORMATION MODELING (BIM) FOR INFRASTRUCTURE. $1,541,157 from the Federal Highway Administration. 1/2/2023 - 12/31/2027.
- Clairmont Clementson (PI). Seasonal influence on the flow characteristics of distillers dried grains with soluble (DDGs) produced in North Dakota. $53,340 from the ND Corn Utilization Council. 7/1/2023 - 6/30/2025.

- Clairmont Clementson (PI), Kenneth Hellevang (CPI). Identification of breakage susceptibility of North Dakota corn varieties, impact of selected parameters, and development of predictive model. $113,417 from the ND Corn Utilization Council. 7/1/2023 - 6/30/2025.
- Clairmont Clementson (PI), Kenneth Hellevang (CPI), Igathinathane Cannayen (CPI). The thermo-physical properties of North Dakota corn varieties. $70,820 from the ND Corn Utilization Council. 7/1/2023 - 6/30/2025.
- Ademola Monsur Hammed (PI), Ewumbua Monono (CPI), Niloy Chandra Sarker (CPI). Digestibility and toxicity of corn-based Bale net wrap. $71,496 from the ND Corn Utilization Council. 7/1/2023 - 7/1/2025.
- Ewumbua Monono (PI), Mijia Yang (CPI), Niloy Chandra Sarker (CPI). CoRncrete: Making Molds or Preforms Using a 3D-Printer. $55,600 from the ND Corn Utilization Council. 7/1/2023 - 6/30/2025.
- Ewumbua Monono (PI), Niloy Chandra Sarker (CPI). Identifying the Unique Properties and Potential Uses of North Dakota Distiller Corn Oil. $44,440 from the ND Corn Utilization Council. 7/1/2023 - 6/30/2025.
- Ewumbua Monono (PI), Kenneth Hellevang (CPI). Evaluating the Quality of Soybeans Killed at Green and Semi-green Maturities after Field Dry-down Under Different Weather Conditions. $36,190 from the ND Soybean Council. 7/1/2023 - 6/30/2024.
- Ravi Kiran Yellavajjala (PI). Improving the Freeze-Thaw Performance of Concrete. $50,000 from the ND Corn Utilization Council. 7/1/2023 - 6/30/2025.
- Wenjie Xia (PI), Dali Sun (CPI). Tailored Design of Corn-based Plastics for 3D Printing. $49,896 from the ND Corn Utilization Council. 7/1/2023 - 6/30/2025.
- Shuvashis Dey (PI). Development of an Inexpensive and Pervasive Wireless Soil Moisture Sensing System for Optimum Growth and Yield of Soybeans. $34,824 from the ND Soybean Council. 7/1/2023 - 6/30/2024.
- Shuvashis Dey (PI). Low-Cost, Pervasive and Wireless Monitoring of Soil Moisture for Enhanced Growth and Yield of Corns. $35,474 from the ND Corn Utilization Council. 7/1/2023 - 6/30/2024.
- Shuvashis Dey (PI). Towards a Low-cost, Pervasive Wireless Soil Salinity and Nutrient (N-P-K) Sensing System for Precision Agriculture. $82,222 from the National Aeronautics and Space Administration. 3/1/2023 - 2/29/2024.
- Mijia Yang (PI). A corn-stover-based biochar concrete. $26,630 from the ND Corn Utilization Council. 7/1/2023 - 6/30/2024.
- Joao Paulo Cassol Flores (CPI). Understanding How Fusarium Affects Soybean in North Dakota and Development of Disease Management Strategies. $66,233 from the ND Soybean Council. 7/1/2023 - 6/30/2024.
- Dean D Steele (CPI). Performance of drought-tolerant corn hybrids under varying irrigation strategies. $20,342 from the ND Corn Utilization Council. 7/1/2023 - 6/30/2024.
- Wenjie Xia (CPI). Upcycling Lignocellulose Waste for Value-Addition of Corn Byproducts: Husks and Stalks. $24,984 from the ND Corn Utilization Council. 4/1/2023 - 3/31/2024.

RECENT PUBLICATIONS

For 2022, 126 publications by authors with the College of Engineering affiliation have appeared in various journals, according to the ISI Web of Science and submissions from faculty. Here are some of the most recent publications:

- Ahmed, Fateen, and Jeremy Straub. 2022. “Initial Work on the Development of a Hardware-Based Gradient Descent Trained Expert System.” *Systems* 10 (5): 160. https://doi.org/10.3390/systems10050160.
- Ahmed, Mohammed Raju, Billy Ram, Cengiz Koparan, Kirk Howatt, Yu Zhang, and Xin Sun. 2022. “Multiclass Classification on Soybean and Weed Species Using a Customized Greenhouse Robotic and Hyperspectral Combination System.” *Journal of the ASABE* 65 (5): 1071–80. https://doi.org/10.13031/ja.15131.
- De Menezes, Thiago D. S., Chaoran Tu, Valentin Besse, Maurice O’Sullivan, Vladimir S. Grigoryan, Curtis R. Menyuk, and Ivan T. Lima. 2022. “Nonlinear Spectrum Modulation in the Anomalous Dispersion Regime Using Second- and Third-Order Solitons.” *Photonics* 9 (10): 748. https://doi.org/10.3390/photonics9100748.

- Ejjigu, Nega, Khalid Abdelgadir, Zachariah Flaten, Cameron Hoff, Chen-Zhong Li, and Dali Sun. 2022. "Environmental Noise Reduction for Tunable Resistive Pulse Sensing of Extracellular Vesicles." *Sensors and Actuators A: Physical* 346 (October): 113832. https://doi.org/10.1016/j.sna.2022.113832.
- Eshkabilov, Sulaymon, Ismat Ara, and Fardad Azarmi. 2022. "A Comprehensive Investigation on Application of Machine Learning for Optimization of Process Parameters of Laser Powder Bed Fusion-Processed 316L Stainless Steel." *The International Journal of Advanced Manufacturing Technology*, November. https://doi.org/10.1007/s00170-022-10331-y.
- Eshkabilov, Sulaymon, John Stenger, Elizabeth N. Knutson, Erdem Küçüktopcu, Halis Simsek, and Chiwon W. Lee. 2022. "Hyperspectral Image Data and Waveband Indexing Methods to Estimate Nutrient Concentration on Lettuce (Lactuca Sativa L.) Cultivars." *Sensors* 22 (21): 8158. https://doi.org/10.3390/s22218158.
- Khan, Md Rakib Hasan, Raj Shankar Hazra, Gauthami Nair, Jiyan Mohammad, Long Jiang, Katie Reindl, Mohammad Khalid Jawed, Sabha Ganai, and Mohiuddin Quadir. 2022. "Cellulose Nanofibers as Scaffold-Forming Materials for Thin Film Drug Delivery Systems." *International Journal of Pharmaceutics* 627 (November): 122189. https://doi.org/10.1016/j.ijpharm.2022.122189.
- Nusrat, Tasin, Firas Slewa Dawod, Tania Islam, Pratik Kunkolienker, Sayan Roy, Md Mirazur Rahman, Susmita Ghosh, Shuvashis Dey, Dipankar Mitra, and Benjamin D. Braaten. 2022. "A Comprehensive Study on Next-Generation Electromagnetics Devices and Techniques for Internet of Everything (IoE)." *Electronics* 11 (20): 3341. https://doi.org/10.3390/electronics11203341.
- Xu, Luyang, Dawei Zhang, Ying Huang, Shuomang Shi, Hong Pan, and Yi Bao. 2022. "Monitoring Epoxy Coated Steel under Combined Mechanical Loads and Corrosion Using Fiber Bragg Grating Sensors." *Sensors* 22 (20): 8034. https://doi.org/10.3390/s22208034.
- Zhou, De, Ruilin Tian, Zhulu Lin, Liming Liu, Junfeng Wang, and Shijia Feng. 2022. "Spatial-Temporal Evolution and Risk Assessment of Land Finance: Evidence from China." *Risks* 10 (10): 196. https://doi.org/10.3390/risks10100196.

See your name on this list? Help us get the word out about your amazing work by submitting it as a **Breakthrough Alert**. **This online form** is an easy, step-by-step guide for summarizing published research for the general public.

College Happenings is distributed to the NDSU College of Engineering staff and faculty every other Tuesday.

Read past issues of *College Happenings* here.

Deadline for submissions to *College Happenings* is 12:00 p.m. Fridays.

Contact kyle.bosch@ndsu.edu to submit items for *College Happenings*.

Follow the College of Engineering on social media.