NDSU | COLLEGE OF ENGINEERING

COLLEGE HAPPENINGS

October 15, 2024

FROM THE INTERIM DEAN

Celebrating Research Excellence

As a Carnegie R1 research institution, one of our primary missions is to perform cutting-edge research that benefits our region, nation, and the world. Our faculty, staff, and students in the College of Engineering are engaged in innovative research projects in a variety of fields, supported by state, federal, and industrial sources. Our research portfolio continues to grow at an impressive rate, as evidenced by several different metrics. Notably, annual research expenditures in the College of Engineering exceeded $11.8M in FY24, a record high and a 31% increase over the previous year. Our researchers also received over $15.4M in new external funding awards in FY24, an increase of 12% from the previous year. These are impressive statistics.

Another measure of our scholarly achievements is through the citations received by our researchers. According to the science-wide author databases of standardized citation indicators, compiled by Stanford University and Elsevier, several faculty in our college are among the top two percent of most cited scientists in the world. The list, updated annually using single-year and career-long data, signifies world-wide recognition for research excellence for those scientists. CoE faculty on the career list include Kalpana Katti and Dinesh Katti from Civil, Construction, and Environmental Engineering; Krishnan Sumathy (Emeritus), Ghodrat Karami, and Xiangfa Wu from Mechanical Engineering; Simone Ludwig and Jeremy Straub from Computer Science; and Qifeng Zhang from Electrical and Computer Engineering. The 2023 single-year list also includes Kalpana Katti, Dinesh Katti, Simone Ludwig, and Jeremy Straub, as well as Xuefeng Chu and Ying Huang from CCEE and Ben Braaten from ECE. Congratulations to all of these faculty members on their outstanding accomplishments!

The research performed in the College of Engineering has broad impacts, leading to new scientific discoveries, promoting technology transfer and economic development across the region, and enhancing our educational programs. Thanks to all of our faculty, staff, and students for your dedicated efforts to grow our research enterprise.

Alan R. Kallmeyer, Ph.D.
Interim Dean | College of Engineering

IN THE NEWS

NDSU launches Bison to the Bakken learning experience program

'It's given me a dream to pursue'

Researchers from NDSU make top scientists list

Registration for Three Minute Thesis Competition set to open

CONGRATULATIONS

Several College of Engineering faculty were recognized among the top two percent of scientists in the world, according to the Science-wide author databases of standardized citation indicators.

The list recognizes the most influential researchers across a broad range of scientific fields and pulls from citation metrics such as h-index, co-authorship and adjusted citation counts. The list is updated annually using single-year (2023 in this case) and career-long data for current relevance.

Civil, Construction, and Environmental Engineering

- Xuefeng Chu
- Ying Huang
- Dinesh Katti
- Kalpana Katti

Computer Science

- Simone Ludwig
- Jeremy Straub

Electrical Engineering

- Ben Braaten
- Qifeng Zhang

Mechanical Engineering

- Ghodrat Karami
- Krishnan Sumathy (Emeritus)
- Xiangfa Wu

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

Wednesday, October 16, **Bison Advise Training**. Becky Bahe from the Career and Advising Center will be conducting Bison Advise training for setting up availability on your calendar. 11:00 a.m. – 12:00 p.m. on Zoom.

Tuesday, October 31, **University-Industry Partnerships**. This talk featuring Tony Boccanfuso, President and CEO of UIDP, will provide valuable knowledge and tools to engage with industry partners. 10 – 11 a.m. in the Memorial Union Hidatsa Room. Register to attend

Wednesday, November 13, **Academic Programs Fair**. Designed to introduce staff to the easiest path to professional development. Visit with departments about their offerings and learn about the student supports that are in place for staff who take classes. 2:00 p.m. in the Memorial Union Ballroom.

EMPLOYEE ENGAGEMENT INITIATIVE

The President's Council for Campus Well-being is working with Gallup, a nationally recognized workplace survey and action firm, to help unit leaders understand and improve engagement by surveying NDSU staff, faculty and administration.

This brief 17-question survey opened on October 14 and is completely confidential, with no individual data being shared with NDSU personnel or leadership. Survey results will inform conversations and action planning across units on ways to strengthen employee engagement for our campus well-being.

Learn more about the Employee Engagement Initiative here.

FAST TRACK LEADERSHIP TRAINING

Fast Track Leadership Training will be offered this Fall 2024. Applications are now open. This leadership development opportunity will be onsite and open to all full-time employees of the institution who meet the eligibility requirements listed below. Whether you are currently in a leadership role, or are interested in learning skills for advancement, this training is for you. The training is sponsored by Agricultural Affairs, Research and Creative Activity, and the Office of the Provost.

Availability: 35 seats

When: December 9-11, 2024

Where: The training sessions will be in-person and held on the main NDSU campus.

About the Trainers: Fast Track Leadership (http://wetrainleaders.com/) is an organization that specializes in leadership training for academic institutions.

About the Program: Participants in the program will learn the following:

- Influence and persuasion skills
- Skills for identifying and managing conflict
- Tools to artfully manage difficult conversations
- Strategies to successfully lead change
- Ways to capitalize on your team's motivation at work
- Strategies for managing effective teams
- Ways to create collaborative organizational cultures
- Self-insight through 4 valid and reliable psychological leadership assessment tools
- Analyze your leadership strengths and assess your risk of derailment
- Individualized leadership development planning to further your career
- Access to the FastTrack Online Leadership Library

Application Deadline: October 25, 2024

Apply at: https://ndstate.co1.qualtrics.com/jfe/form/SV_0eQYBDjvj4GV5fo

Follow the link to the campus kudos nomination form: Campus Kudos Nomination Form | NDSU Staff Senate | NDSU

STUFFED ANIMALS FOR STUDENTS

Last Spring the IT Division and NDSU Libraries provided stuffed animals students could "adopt" at no charge as they prepared for their final exams, and the program proved to be extremely popular.

If you have stuffed animals of any kind that your family has outgrown, and you're willing to make them available to our students, simply bring your donations to QBB 206 (the IT Service Center) or NDSU Libraries by Monday, Dec. 2 – there are drop-off boxes in these locations.

The animals will be washed and set on tables in the Library and the QBB second floor lobby the week before finals.

FUNDING OPPORTUNITIES

The NDSU Office of Research and Creative Activity has several internal funding opportunities available for researchers in 2024-25.

RCA BIG IDEAS RESEARCH SEED PROJECTS – STEM FIELDS
Application Deadline: Monday, November 4, 2024

These seed projects will provide up to $100,000 to support ideas that pursue innovative, ambitious solutions to impactful research questions that fit within NDSU's strategic priorities and/or the ND Science and Technology Plan. The purpose of the program is to support activities such as pilot studies or gathering preliminary data that will allow teams to advance ideas for the development of competitive proposals in pursuit of significant external funding, including NSF EPSCoR and EPSCoR-like programs (e.g. NIH COBRE). For this call, proposals must be for projects within science, technology, engineering, and mathematics (STEM) fields as defined by the National Science Foundation and/or the National Institutes of Health. This includes the social, behavioral, economic and science of STEM education fields. PIs must be at the Associate Professor rank or above and have a prior funding track record as a PI from the agency where submission is intended. ***Learn more and apply>>***

EDRF INFRASTRUCTURE PROGRAM
Application Deadline: Monday, November 4, 2024

The Infrastructure Program will provide up to $50,000 for improvement of infrastructure in support of research and economic development goals that fit within NDSU's strategic priorities or align with prior and/or existing research investments at NDSU. This program can be used for acquisition of research instrumentation, equipment, and related installation services. Full-time faculty and research staff at NDSU are eligible to apply. ***Learn more and apply>>***

NASA EPSCOR PILOT GRANTS
Application Deadline: Monday, November 4, 2024

NASA Established Program to Stimulate Competitive Research (EPSCoR) establishes partnerships with government, higher education, and industry that are designed to effect lasting improvements in a state or region's research infrastructure, research and development capacity, and its national research and development competitiveness. This grant program awards up to $58,000 to develop pilot projects that are in line with NASA's overall mission. Each proposed NASA EPSCoR pilot project shall perform scientific and/or technical research in areas that support NASA's strategic research and technology development priorities with the goal of ensuring a competitive submission to a NASA funding opportunity. All proposals should emphasize and clearly articulate how the pilot project develops capabilities to compete for funds from NASA. ***Learn more and apply >>***

RECENTLY AWARDED GRANTS

- Mijia Yang (Principal Investigator). Multiscale Modeling of Fiber Woven Composite through Fusion of NASMAT and Peridynamics. $75,112 from the National Aeronautics and Space Administration. 9/1/2024 - 8/31/2025.
- Benjamin Davis Braaten (Principal Investigator), Ewumbua Monono (Co-PI), Xin Sun (Co-PI), Minwei Xu (Co-PI), Umamaheswara Rao Tida (Co-PI), Shuvashis Dey (Co-PI), Sulaymon Eshkabilov (Co-PI), Qifeng Zhang (Co-PI). Fusion of Machine Learning and Electromagnetic Sensors for Real-Time Local Decisions in Agriculture. $217,074 from the Agricultural Research Service. 8/1/2024 - 7/31/2025.
- Yao Yu (Principal Investigator), Qifeng Zhang (Co-PI). Intelligent Digital Twin for Resilient Basing (IDTRB). $54,033 from the Department of Defense. 8/15/2024 - 2/15/2025.
- Janet J. Knodel (Principal Investigator), Patrick Beauzay (Co-PI), Andrew J Friskop (Co-PI), Samuel Markell (Co-PI), Adam Alan Marx (Co-PI), Esther Ebata McGinnis (Co-PI), Rob Proulx (Co-PI), Richard Wade Webster (Co-PI). Extension IPM Program of North Dakota. $220,655 from the National Institute of Food & Agriculture. 9/1/2024 - 8/31/2025.

RECENTLY SUBMITTED PROPOSALS

- Clairmont Clementson (Principal Investigator), Zhulu Lin (Faculty), David G Ripplinger (Faculty) Kenneth Hellevang (Other Professional). Modeling of heat-induced quality variations of corn: an intra-study of corn varieties under high temperature drying. $298,891 from the National Institute of Food & Agriculture. 7/1/2025 - 6/30/2027.
- Xiaoyu Feng (Principal Investigator), Guillermo Scaglia (Co-PI), Christopher Scott Schauer (Co-PI), Rachel Gibbs (Co-PI), Lacey Quail (Co-PI), Jon Biermacher (Co-PI), Lauren Lorene Hulsman Hanna (Faculty), Leon George Schumacher (Co-PI). PARTNERSHIP: Evaluating the role of climate smart technologies in economic and environmental sustainability of the sheep industry. $1,150,000 from the National Institute of Food & Agriculture. 6/1/2025 - 5/31/2030.
- Xiaoyu Feng (Principal Investigator), Siew Hoon Lim (Co-PI), Eric Branch (Co-PI). PARTNERSHIP: Portable Dual-Function Biosensor for Early Detection and Management of Sugar Beet Foliar Diseases. $800,000 from the National Institute of Food & Agriculture. 5/1/2025 - 4/30/2028.
- Yao Yu (Principal Investigator), Adam Curtis Gladen (Co-PI), Mijia Yang (Co-PI). Redefining the future of sustainable living: Creating the most energy-efficient, affordable, and environmentally responsible home in the United States. $246,128 from Rural Development. 1/1/2025 - 12/31/2026.
- Zhikai Liang (Principal Investigator), Joao Paulo Cassol Flores (Co-PI). Collaborative Research: RESEARCH-PGR: Deciphering Sorghum Heat Tolerance Transferability using Response Cistrome Mapping. $1,032,954 from the National Science Foundation. 4/1/2025 - 3/31/2028.
- Inbae Jeong (Principal Investigator), Youjin Jang (Co-PI). Multi-UAV System for Large Scale Field Crop Health Monitoring using Digital Twin. $650,000 from the National Institute of Food & Agriculture. 4/1/2025 - 3/31/2028.
- Yan Zhang (Principal Investigator). Miniature microscope platform for simultaneous imaging of neural and cerebrospinal fluid dynamics in freely behaving animals. $72,500 from the National Institutes of Health. 9/1/2026 - 8/31/2028.
- Mijia Yang (Principal Investigator), Long Jiang (Co-PI), Peyman Harirchi (Co-PI), Armstrong Aboah (Co-PI). Development of multifunctional concrete using activated biochar derived from agricultural waste. $649,534 from the National Institute of Food & Agriculture. 3/1/2025 - 2/28/2029.

RECENT PUBLICATIONS

For 2024, 116 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:

- Al-Qudah, Saleh, and Mijia Yang. “Effective Hybrid Structure Health Monitoring through Parametric Study of GoogLeNet.” *AI* 5, no. 3 (September 2024): 1558–74. https://doi.org/10.3390/ai5030075.
- Asha, Labiba Noshin, Lucy G. Aragon, Arup Dey, and Nita Yodo. “Location Optimization Strategies for Corn Production and Distribution towards Sustainable Green Supply Chain.” *LOGISTICS-BASEL* 8, no. 3 (September 2024): 78. https://doi.org/10.3390/logistics8030078.
- Ayaz, Muhammad, Irfan Ullah, Adnan Iftikhar, Syed Muzahir Abbas, Benjamin D. Braaten, Shahid Khattak, and Moath Alathbah. “A Flexible Conformal Phased Array With Embedded Magnetic Particles Based Composite Right/Left Handed Metamaterial Phase Shifters.” *IEEE ACCESS* 12 (2024): 129147–59. https://doi.org/10.1109/ACCESS.2024.3452185.
- Baidhe, Emmanuel, Clairmont L. Clementson, Judith Senyah, and Ademola Hammed. “Appraisal of Post-Harvest Drying and Storage Operations in Africa: Perspectives on Enhancing Grain Quality.” *AGRIENGINEERING* 6, no. 3 (September 2024): 3030–57. https://doi.org/10.3390/agriengineering6030174.
- Gholamian, Mahzad, Omid Beik, and Muhammad Arshad. “A Review of State-of-the-Art Multiphase and Hybrid Electric Machines.” *ELECTRONICS* 13, no. 18 (September 2024): 3636. https://doi.org/10.3390/electronics13183636.

- Gladen, Adam C., Xuelei Xiao, Alexander Zeller, and Yao Yu. “A Waste Heat Assessment of a Manufacturing Facility With Consideration for Demand Matching Through Thermal Energy Storage.” *JOURNAL OF SOLAR ENERGY ENGINEERING-TRANSACTIONS OF THE ASME* 146, no. 5 (October 1, 2024): 051012. https://doi.org/10.1115/1.4065974.
- Ma, Fuyilong, Huanhai Xin, Di Wu, Yun Liu, and Xia Chen. “Assessing Small-Signal Grid Strength of 100% Inverter-Based Power Systems.” *IEEE TRANSACTIONS ON POWER DELIVERY* 39, no. 5 (October 2024): 2784–96. https://doi.org/10.1109/TPWRD.2024.3432582.
- Mansouri, Siavash, Raj Shankar Hazra, Shanti Swarup, and Mohiuddin Quadir. “Design of a Bio-Based Flame-Retardant Epoxy/Amine Cross-Linked Coatings.” *JOURNAL OF APPLIED POLYMER SCIENCE*, September 27, 2024. https://doi.org/10.1002/app.56279.
- Motegaonkar, Shivani, Amar Shankar, Humeera Tazeen, Mahendra Gunjal, and Sachin Payyanad. “A Comprehensive Review on Carrot (*Daucus Carota* L.): The Effect of Different Drying Methods on Nutritional Properties and Its Processing as Value-Added Foods.” *SUSTAINABLE FOOD TECHNOLOGY* 2, no. 3 (May 24, 2024): 667–88. https://doi.org/10.1039/d3fb00162h.
- Qayyum, Arshad, Muhammad Faisal Javed, Raheel Asghar, Ammar Iqtidar, Hisham Alabduljabbar, Mohsin Ali Khan, and Mujahid Ali. “Promoting the Sustainable Construction: A Scientometric Review on the Utilization of Waste Glass in Concrete.” *REVIEWS ON ADVANCED MATERIALS SCIENCE* 63, no. 1 (September 26, 2024): 20240036. https://doi.org/10.1515/rams-2024-0036.
- Sarani Rad, Fatemeh, Maryam Amiri, and Juan Li. “Optimizing Nutritional Decisions: A Particle Swarm Optimization-Simulated Annealing-Enhanced Analytic Hierarchy Process Approach for Personalized Meal Planning.” *NUTRIENTS* 16, no. 18 (September 2024): 3117. https://doi.org/10.3390/nu16183117.
- Shevtsova, Tetiana, Kweeni Iduoku, Kristen Patnode Setien, Inioluwa Olabode, Gerardo M. Casanola-Martin, Bakhtiyor Rasulev, and Andriy Voronov. “Enhancing Plant Protein-Based Bioplastics with Natural Additives: A Comprehensive Study by Experimental and Computational Approaches.” *ACS SUSTAINABLE CHEMISTRY & ENGINEERING*, September 27, 2024. https://doi.org/10.1021/acssuschemeng.4c03971.
- Smith, David, Paula Pickett, Joncy Thorpe, Theresa Grabowski, and Fardad Azarmi. “Evaluation of Numerical and Analytical Methods to Accurately Measure Elastic Modulus of the Cobalt Chromium Alloy Fabricated by Laser Direct Energy Deposition Process.” *JOURNAL OF MATERIALS ENGINEERING AND PERFORMANCE*, October 3, 2024. https://doi.org/10.1007/s11665-024-10206-1.

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*.

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