

COLLEGE HAPPENINGS

July 25, 2023

FROM THE INTERIM DEAN

The Importance of Outreach

This week marks the third and final week of NDSU's STEM Kids summer camp, an annual event hosted by the College of Engineering to introduce students to STEM subjects and inspire them to pursue educational and career opportunities in scientific and technical fields. This year, 430 students ranging from kindergarten to high school registered for a total of 640 spots in classes covering a variety of exciting topics, including coding, robot design, forensics, entrepreneurship, and even golf course design! Kudos go to our Outreach Coordinator, Angela Gross, Associate Dean Scott Pryor, and a dedicated team of talented faculty, staff, students, and teachers from area schools who served as course instructors and aides, for making this camp a huge success! The STEM Kids camp, the largest outreach event hosted by the College of Engineering, continues to grow in popularity throughout the community. Notably, our participant numbers were up about 50% from last year, with many classes filling up within days of opening registration.

Like many universities nationwide, NDSU is experiencing a decline in enrollments in several STEM fields, including engineering. But the demand for our graduates continues to grow, and to meet that demand we must build a pipeline of future engineering students into our programs. One of our best opportunities to build this pipeline is to educate and motivate young students to explore the wonders of science and engineering, and help them realize the great opportunities they can pursue with a STEM-based degree. These efforts are critical to our long-term success, and will remain a top priority of the CoE as we seek to reverse our recent enrollment trends.

Many of our faculty members have included K-12 education and outreach as a component in their grant proposals, significantly broadening the impacts of their research to educate K-12 students across the region, including traditionally underrepresented populations. Our staff and students, both undergraduate and graduate, have participated in these activities, enthusiastically engaging with these young students who will one day make up our future workforce. All of these efforts are highly valued and appreciated. For those of you who are interested in becoming involved in our outreach efforts, or who would like to explore opportunities for development of outreach activities as part of your educational or research programs, I would encourage you to reach out to Angela Gross to begin a conversation. We would welcome your ideas and assistance in this important endeavor!

Alan R. Kallmeyer, Ph.D.

Interim Dean | College of Engineering

IN THE NEWS

[Can cancer be cured by oregano and cranberry?](#)

[STEM Kids' Camp Overview featuring Charlotte and Eleanor](#)

[Faculty member participates in national cybersecurity workforce roundtable](#)

[Graduation List Spring 2023](#)

[Cybersecurity students attend New York conference, competition](#)

CONGRATULATIONS

Michael Chu, professor in the **Department of Civil, Construction and Environmental Engineering**, obtained an NDSU EPSCoR instrument grant to purchase an LC-Q-TOF for contaminant analysis.

Jiale Xu, assistant professor in the **Department of Civil, Construction and Environmental Engineering**, received his first federal grant from the National Science Foundation. The grant funds research on the use of benign UV radiation for disinfection.

Please let [College Happenings](#) know about honors, awards, new grants and other announcements so we can share them with other faculty and staff.

NEW HIRES

Two of the three new College of Engineering advisors have been hired and are on campus going through training.

- **Carmen Biddle** will be advising for the Mechanical Engineering program.
- **David (Dave) Shaw** will be advising in the Department of Civil, Construction and Environmental Engineering.

UPCOMING EVENTS

July 24-27, **STEM High School Camp**. Mornings will be spent on campus working with NDSU faculty in the labs and afternoons students will be going out on engineering industry visits.

Friday, August 4, **Summer Research Poster Session**. You are invited to attend a public poster session featuring more than 60 high school and undergraduate students who have been participating in summer research experiences at NDSU this summer. 1:00 – 3:00 p.m. A. Glenn Hill Center Main Hallway.

Wednesday, August 9, **Academic Leaders Orientation and Retreat** for Department Chairs/Heads and Deans.

Tuesday, August 15, **New Faculty Orientation**. This event is intended for faculty that have started at NDSU since August 16, 2022. [Register Here](#)

Wednesday, August 16, **Annual Faculty/Academic Staff Conference**. Presentations by NDSU faculty and staff demonstrating best practices for research, instruction, advising, assessment, campus climate, inclusion, mentoring, leadership, and classroom technologies. [Register Here](#)

NDSU'S FINANCIAL TRANSFORMATION

Last week, NDSU officially began the transition to the new operating model for financial activities across the university. As part of this transition, the [Accounting Service Center Website](#) has been refreshed to provide a more streamlined and user-friendly experience for those seeking financial assistance. This website currently includes:

- Frequently Asked Questions about P-Cards, Purchasing, Travel & Expense, and other items
- Key forms to utilize when completing various financial tasks
- Contact information for the centers and staff
- An outline of reorganization responsibilities.

Additionally, a website featuring details about the [College of Engineering Business Center](#) has been created. Similarly to the Accounting Service Center website, the CoE Business Center page will provide you with pathways of contact for general and specific inquiries related to financial activities specific to our college and departments.

The CoE Business Center page is maintained and updated by NDSU Finance and Administration. Links to it can be found on the College of Engineering website under the Faculty and Staff tab.

OFFICE GARBAGE AND RECYCLING CHANGES

Facilities Management is in the process of changing garbage/recycling procedures for all buildings on campus. To summarize the overall changes:

- Employees in private/individual offices will need to place garbage cans outside their offices to indicate it should be emptied.
- All other employees should place garbage cans in a place visible to custodial staff (e.g., alongside desk, or other place agreed upon with custodial staff) when garbage needs to be emptied.
- Recycling will be centralized in each building.
- Research labs will have one centralized receptacle that will be emptied daily by custodial staff.

Due to the shortage of custodial staff, these changes will help custodians have more time to focus on maintaining student-use spaces.

UNDERGRADUATE RESEARCH WRITING AND MENTORING CAMP

The first NDSU Undergraduate Research Writing and Mentoring Camp will be held on September 8th 2023 from 11 am to 4 pm. This program provides undergraduate researchers practical advice and experiential learning activities on writing from research and creating effective professional materials. Participants will also learn approaches to enhance research mentoring experiences with mentors and peers and applying graduate programs.

The camp is free, but space is limited. Please encourage your undergraduate researchers to register before September 1, 2023 if they are interested. Register here:



NDSU VOLUNTEER PASSPORT

Volunteering is a way to create connection and strengthen your affinity to our campus community. Staff and faculty volunteers are vital to the success of our campus events, and we couldn't do it without your support.

As we enter the second year of the Volunteer Passport program, we want to provide the dates for upcoming volunteer experiences and encourage you to volunteer. The volunteer sign ups come out several weeks prior to the event.

NDSU Volunteer Passport:

Be a volunteer champion! Complete 5 of the 9 volunteer experiences during the academic year to be recognized as a volunteer champion on our campus! Volunteers Experiences include:

- Move In Experience/Welcome Week **(August 19-September 2, 2023)**
 - Move-In Day
 - Events
- Career Fair **(September 20, 2023 and February 7, 2024)**
- Homecoming **(September 25-30, 2023)**
- Late Night Breakfast **(December 11, 2023 and May 6, 2024)**
- Commencement **(December 15, 2023 and May 11, 2024)**
- Orientation **(Summer 2024)**

FUNDING OPPORTUNITIES

DOE: NOSI - University Turbine Systems Research

Forecasted opportunity

If issued, the objective of this [Funding Opportunity](#) will be to solicit and competitively award university-based R&D projects that address and resolve fundamental scientific challenges and applied engineering technology issues associated with thermal management of hot gas path gas turbine components and combustors. Specifically, R&D projects will conduct fundamental and applied research to develop advanced materials and advanced hot gas path components which utilize these advanced materials, advanced cooling architectures, and advanced manufacturing methods.

If issued, the FOA will seek to solicit and competitively award laboratory/bench-scale R&D in the following areas of interest (AOI):

AOI 1: Fundamental Materials Development for Hot Gas Path Hydrogen Turbine Components

AOI 2: Applied Materials Development for Hot Gas Path Hydrogen Turbine Components

AOI 3: Fundamental Materials Development for Hydrogen Rotating Detonation Engines

Cost share is required.

NSF: Computer and Information Science and Engineering (CISE) - Core Programs

This solicitation covers submission to the following CISE core programs [[NSF 23-561](#)]. Please see the individual program webpages below for more information on what is within scope for these programs:

Division of Computing and Communication Foundations:

- Algorithmic Foundations (AF) program [[Program Webpage](#)] supports potentially transformative projects in the theory of algorithms and computational complexity, characterized by algorithmic innovation and rigorous analysis.
- Communications and Information Foundations (CIF) program [[Program Webpage](#)] supports foundational research that addresses the theoretical underpinnings of information acquisition, transmission, and processing in communications and information processing systems.
- Foundations of Emerging Technologies (FET) program [[Program Webpage](#)] supports foundational research at the intersection of computing and biological systems, nanoscale science and engineering, quantum information science, and other promising disruptive technologies supporting novel computing/communication models.

- Software and Hardware Foundations (SHF) program [[Program Webpage](#)] supports foundational research in the design, verification, operation, and evaluation of computer hardware and software through novel approaches, robust theories, high-leverage tools, and lasting principles.

Division of Computer and Network Systems:

- Computer Systems Research (CSR) [[Program Webpage](#)] supports the advancement and holistic design and development of integrated software and hardware computing systems; and
- Networking Technology and Systems (NeTS) [[Program Webpage](#)] supports research that advances wired and wireless networking systems, develops a better understanding of the fundamental properties and tradeoffs involved, as well as the abstractions and tools used in designing, building, measuring and managing them.

Division of Information and Intelligent Systems:

- Human-Centered Computing (HCC) program [[Program Webpage](#)] supports research in human-computer interaction, integrating across fields including computing, information, social, and behavioral sciences, to (re)design technologies that amplify human capabilities, and understand how human, technical, and contextual aspects of computing and communication systems shape their benefits, effects, and risks.
- Information Integration and Informatics (III) program [[Program Webpage](#)] supports research on computational approaches to the full data lifecycle to maximize the utility of information resources.
- Robust Intelligence (RI) program [[Program Webpage](#)] supports computational research to understand and enable intelligent systems in complex, realistic contexts.

Office of Advanced Cyberinfrastructure:

- OAC Core Research (OAC Core) program [[Program Webpage](#)] supports translational research on the design, development, deployment, experimentation, and application of advanced research cyberinfrastructure (CI) to enable new frontiers of discovery and innovation.

There are 3 Project Classes for this Solicitation

- Small Projects: with total budgets up to \$600,000 for up to 3 years
Deadline: Proposals Accepted ANYTIME
- Medium Projects: with total budgets ranging \$600,001 to \$1,200,000 for up to 4 years
Deadline: October 23, 2023
- OAC Core Projects: with total budgets up to \$600,000 for up to 3 years
Deadline: October 23, 2023

RECENTLY AWARDED GRANTS

- Adam Curtis Gladen (PI). Advanced Materials for Lithium Ion Batteries - Phase V. \$150,000 from the U.S. Army. 3/1/2023 - 8/12/2025.
- Kalpana Katti (PI), Ying Huang (CPI), Dinesh R Katti (CPI). Biomimetic and Bioinspired Infrastructure Coatings. \$300,000 from the U.S. Army. 6/20/2023 - 6/20/2025.
- Youjin Jang (PI), Zhibin Lin (CPI), Danling Wang (CPI), Inbae Jeong (CPI), Chau Le (CPI). Enhanced safety of highway construction site using low cost, wearable sensor network. \$149,974 from the MN Department of Transportation. 6/23/2023 - 8/31/2025.
- Mijia Yang (PI). Impact Simulation to Support the Development of an Artificial BirdMaterial for Aircraft Certification. \$45,000 from the National Aeronautics and Space Administration. 5/16/2023 - 5/15/2024.
- Zhulu Lin (PI). Evaluating the Effectiveness of Agricultural Conservation Practices in Improving Surface Water Quality in the Red River of the North Basin (Minnesota) through Trend Analysis. \$25,000 from the International Water Institute. 8/1/2023 - 7/31/2025.

- Youjin Jang (PI), Inbae Jeong (CPI). STEM distancing learning in Metaverse. \$3,218 from the NDSU Foundation. 5/1/2023 - 10/31/2024.

RECENTLY SUBMITTED PROPOSALS

- Juan Li (PI). Collaborative Research: EAGER: Education DCL: Redefining Cybersecurity Education for Criminal Justice Professionals: Bridging the Gap in National Cyber Capabilities. \$124,086 from the National Science Foundation. 10/1/2023 - 9/30/2025
- Xin Sun (PI), Leon George Schumacher (CPI), Nitin Rai (CPI). Efficacy of AI-Powered Micro-Local Weather Forecasting for Precision Agriculture and Data-Driven Farming in the State of North Dakota. \$28,826 from the ND Department of Agriculture. 8/16/2023 - 8/15/2024.
- Xin Sun (PI). Developing systems to expedite phenotyping of biotic and abiotic stress tolerance in Brassica oilseed and small grain cereal crops. \$125,000 from the Agricultural Research Service. 9/1/2023 - 3/31/2025.
- Mijia Yang (PI), Peyman Harirchi (CPI), Grant Lebahn (CPI). Effect of Vibration on Concrete Mixtures. \$190,937 from the Iowa Department of Transportation. 1/1/2024 - 12/31/2025.
- Xinhua Jia (PI). North Dakota Water Resources Research Institute Graduate Fellowship Program Support from ND Department of Water Resources 2023-2024. \$25,000 from the ND Department of Water Resources. 9/1/2023 - 8/31/2024.
- Changhui Yan (PI). Understanding Postharvest Physiology of Potato by Genomics, Phenomics, Bioinformatics. \$42,024 from the Agricultural Research Service. 9/1/2023 - 8/31/2025.
- Chad A Ulven (PI), Benjamin Davis Braaten (CPI), Ali Amiri (CPI). Thermoplastic Composites for Expedient Protective Systems and Deployable Force Protection Applications. \$1,989,373 from the U.S. Army. 8/1/2023 - 7/31/2025.
- Xiangfa Wu (PI), Oksana Zholobko (CPI), Adam Curtis Gladen (CPI). Intermediate-temperature PEM water electrolyzer. \$3,842,922 from the Department of Energy. 1/1/2024 - 12/31/2026.
- Xin Sun (PI). Bring Virtual Reality to Modern Precision Agriculture Education Classroom: Using Apple Vision Pro as an Example. \$38,500 from the NDSU Foundation. 11/1/2023 - 10/31/2024.

RECENT PUBLICATIONS

For 2023, 145 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:

- Adeniyi, Adewale, Ibrahim Bello, Taofeek Mukaila, Niloy Chandra Sarker, and Ademola Hammed. 2023. "Trends in Biological Ammonia Production." *BIOTECH* 12 (2): 41. <https://doi.org/10.3390/biotech12020041>.
- Ajmera, Beena, Aaron Lee M. Daigh, and Kamal Raj Upadhaya. 2023. "Statistical Study of the Geology, Topography, and Pore Fluid Salinity Controls on the Large Slope Failures Observed in North Dakota." In *GEO-CONGRESS 2023: GEOTECHNICS OF NATURAL HAZARDS*, edited by E. Rathje, B. M. Montoya, and M. H. Wayne, 338:491–99. Geotechnical Special Publication. New York: Amer Soc Civil Engineers. <https://www.webofscience.com/wos/woscc/full-record/WOS:001003641100049>.
- Congress, Surya Sarat Chandra, Anand J. Puppala, Prince Kumar, and Louie Verreault. 2023. "Application of Unmanned Aerial Vehicle (UAV) for Reservoir Embankment Inspections." In *GEO-CONGRESS 2023: GEOTECHNICAL DATA ANALYSIS AND COMPUTATION*, edited by E. Rathje, B. M. Montoya, and M. H. Wayne, 342:516–25. Geotechnical Special Publication. New York: Amer Soc Civil Engineers. <https://www.webofscience.com/wos/woscc/full-record/WOS:001003623700052>.
- Doebling, S.W., C.R. Farrar, M.B. Prime, and D.W. Shevitz. 1996. "Damage Identification and Health Monitoring of Structural and Mechanical Systems from Changes in Their Vibration Characteristics: A Literature Review." LA--13070-MS, 249299. <https://doi.org/10.2172/249299>.
- Ghasemi, Arman, Yangchao Liao, Zhaofan Li, Wenjie Xia, and Wei Gao. 2023. "Crystallization and Melting of Polymer Chains on Graphene and Graphene Oxide." *NANOSCALE*, June. <https://doi.org/10.1039/d3nr00817g>.

- Hazra, Raj Shankar, Jayanta Roy, Long Jiang, Dean C. Webster, Md Mukhlesur Rahman, and Mohiuddin Quadir. 2023. “Biobased, Macro-, and Nanoscale Fungicide Delivery Approaches for Plant Fungi Control.” *ACS APPLIED BIO MATERIALS*, July. <https://doi.org/10.1021/acsabm.3c00171>.
- Jha, Ajay Kumar, Mohayeminul Islam, and Sarah Nadi. 2023. “JTEsTMIGBENcH and JTEsTMIGTAx: A Benchmark and Taxonomy for Unit Test Migration.” In *2023 IEEE INTERNATIONAL CONFERENCE ON SOFTWARE ANALYSIS, EVOLUTION AND REENGINEERING, SANER*, edited by T. Zhang, X. Xia, and N. Novielli, 713–17. IEEE International Conference on Software Analysis Evolution and Reengineering. Los Alamitos: IEEE Computer Soc. <https://doi.org/10.1109/SANER56733.2023.00077>.
- Jia, Jicheng, Yongchao Ma, Shengnan Xu, Jiaqi Zheng, Xinli Ma, Yuzhen Zhang, Weijuan Sun, and Lizhi Liu. 2023. “Effect of Academic Self-Efficacy on Test Anxiety of Higher Vocational College Students: The Chain Mediating Effect.” *PSYCHOLOGY RESEARCH AND BEHAVIOR MANAGEMENT* 16: 2417–24. <https://doi.org/10.2147/PRBM.S413382>.
- Jiang, Kun, Danguang Pan, Ying Huang, and Xiangqiu Fu. 2023. “Construction Defect Identification for Structural Sealant by Statistical Driving-Point Accelerance.” *Construction and Building Materials* 392 (August): 131817. <https://doi.org/10.1016/j.conbuildmat.2023.131817>.
- Kumar, Prince, Anand J. Puppala, Surya Sarat Chandra Congress, Krishneswar Ramineni, and Jeb S. Tingle. 2023. “Influence of Compaction Characteristics and Moisture Exposure on Resilient Moduli of Cement-Treated Soil.” In *GEO-CONGRESS 2023: SOIL IMPROVEMENT, GEOENVIRONMENTAL, AND SUSTAINABILITY*, edited by E. Rathje, B. M. Montoya, and M. H. Wayne, 339:370–80. Geotechnical Special Publication. New York: Amer Soc Civil Engineers. <https://www.webofscience.com/wos/woscc/full-record/WOS:001003622600039>.
- Patil, Ujwalkumar D., Daniel Mabagos, Myeong-Ho Yeo, Surya Sarat Chandra Congress, Austin Shelton, and Else Demeulenaere. 2023. “Improvement in Stability of a Tropical Hillslope via Mechanical Root Reinforcement.” In *GEO-CONGRESS 2023: GEOTECHNICS OF NATURAL HAZARDS*, edited by E. Rathje, B. M. Montoya, and M. H. Wayne, 338:469–77. Geotechnical Special Publication. New York: Amer Soc Civil Engineers. <https://www.webofscience.com/wos/woscc/full-record/WOS:001003641100047>.
- Rattanatham, Rujikorn, Jitbanjong Tangpong, Moragot Chatatikun, Dali Sun, Fumitaka Kawakami, Motoki Imai, and Wiyada Kwanhian Klangbud. 2023. “Assessment of Eight Insulin Resistance Surrogate Indexes for Predicting Metabolic Syndrome and Hypertension in Thai Law Enforcement Officers.” *PeerJ* 11 (May): e15463. <https://doi.org/10.7717/peerj.15463>.
- Saha, Biraj, Md Tanbir Khan, Malachi Graupman, Hafiz Muhammad Umer Aslam, Anand K. Gupta, Grant Helmin, Mitchell Larson, et al. 2023. “Impacts of the COVID-19 Pandemic on Landfilling and Recycling in the City of Fargo, North Dakota, USA.” *JOURNAL OF THE AIR & WASTE MANAGEMENT ASSOCIATION*, June. <https://doi.org/10.1080/10962247.2023.2221649>.
- Zohra, Fatema-Tuz, Omar Salim, Shuvashis Dey, Hossein Masoumi, and Nemai Chandra Karmakar. 2023. “Machine Learning Approach to RFID Enabled Health Monitoring of Coal Mine Conveyor Belt.” *IEEE JOURNAL OF RADIO FREQUENCY IDENTIFICATION* 7: 105–17. <https://doi.org/10.1109/JRFID.2023.3267361>.

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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