

Passion to Serve

Those of us working in education and research are all inherently in the business of helping others. A dedication to this vocation is a dedication to serving the wider community. Educators at all levels work assiduously to help students grow; thereby enabling them to solve the problems of the future. The desire to have a lasting impact is a common trait of many in the profession. Positively influencing others' lives and improving the community we serve is a constant challenge we face within a constantly changing educational landscape.

The act of teaching is inherently selfless. Educators impart knowledge and put self-interest aside to help students achieve more than they thought they were capable of attaining. The impact a true mentor makes on another's life may never be known, but today's results reap immeasurable future benefits.

In our service to the state of North Dakota, we show all citizens the pride we have in our graduates and in our skilled workforce. We also reap the benefit of a feeling of profound fulfillment and gratification at completing each day's work.

Conveying our knowledge builds our student's wisdom and, when done selflessly, serves the public in ways that bring contentment and success to the communities across ND. The Students in Technology Transfer and Research (STTAR) program, detailed [on page 4](#) of this issue, is just one example of how the ND EPSCoR State Office and ND industry are working collaboratively with STEM students to share knowledge that will address challenging science and technology-based problems within the state.

When we serve others, we model the strength of good character for students. Service continuously contributes to the building of honorable character among those around us. We are proud of the service done by our researchers, students, mentors, and staff who are working unceasingly and selflessly to continue

to contribute, even when faced with the new challenges brought forth by the pandemic.

One such example of this is ND EPSCoR's K-12 Seed Award opportunity. Read more about how our awardees have served students throughout the education continuum [on page 3](#) of this issue. It is critical to share the science happening in ND through these outreach efforts to excite and engage the next generation of STEM students. In-depth interviews with many ND EPSCoR researchers can be found on the [ND EPSCoR YouTube channel](#), where they tell their stories of service to their community.

Learn more about some of the faculty behind the service to the education community [on page 2](#) of this issue. ND EPSCoR researchers from Mayville State University and Minot State University recently allowed our cameras to capture their research, outreach, and teaching efforts to help improve science, technology, engineering, and mathematics (STEM) education, and to build a pathway for students in ND who are interested in pursuing careers in STEM disciplines.

Selfless service to others makes the world a better place. We invite you to join us in supporting these continuing efforts that help propel our state forward.

In this new year, together, we will serve selflessly, renew our commitments to lifelong learning, become connected more closely to our communities, and look forward to what 2021 will bring.

As the pandemic continues and we begin this new year, I want to send my support to each of you. I hope that you are, and will continue to be, well.

Regards,
Kelly A. Rusch, Ph.D., P.E., BCEE
ND EPSCoR Executive Director



ND EPSCoR creates video tours



ND EPSCoR thanks ND-ACES Materials Design at Biointerfaces Pillar and INSPIRE-ND Center for Sustainable Materials Science (CSMS) researchers **Mikhail Bobylev** (MiSU) and **Khwaja Hossain** (MaSU) for allowing our cameras to capture their research and outreach efforts. Bobylev and Hossain talk with ND EPSCoR about teaching, ND-ACES research, and STEM outreach across ND in these videos.

In the first 360° video (linked in the picture above), Bobylev, a Professor in the Chemistry Department at Minot State University, provides the 360° experience from inside a university lab. The 360° video tours allow the viewer to look around the lab in any direction, creating an immersive virtual experience.

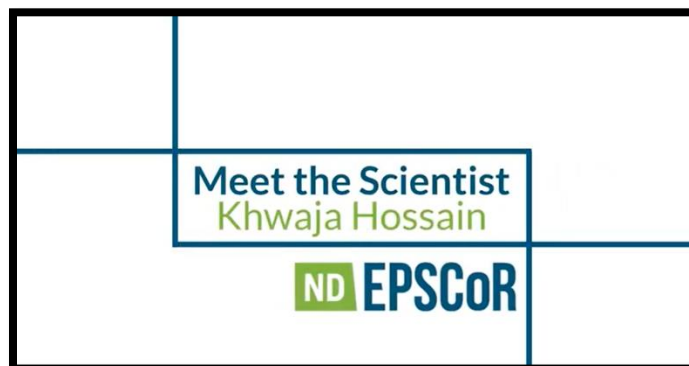
Learn about how **Christopher Heth**, Assistant Professor of Chemistry at Minot State University, purchased a new piece of equipment thanks to a state-funded grant from the ND EPSCoR State Office in the video linked below.



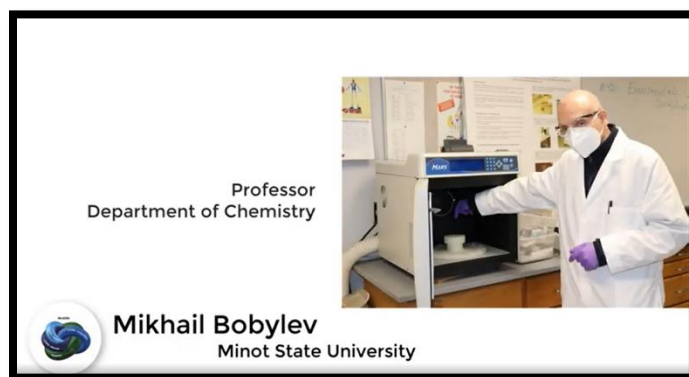
Why are ND EPSCoR state-funded grants for equipment a vital part of building STEM capacity in ND? Equipment plays a crucial role in preparing students for their careers. Access to modern equipment creates opportunities for students to explore and develop their skills. This infrastructure is a vital component of ND

EPSCoR's effort to strengthen the STEM pathway at institutions across the state.

In the next video (linked below), Hossain, a Professor in the Department of Biology at Mayville State University, discusses the importance of the ND-ACES research and its impact on his students in his Meet the Scientist video.



Get to know more about Bobylev's research within the ND-ACES Track-1 cooperative agreement by watching his Meet the Scientist video, linked below.



View all of the videos from our recent visits to Mayville State University and Minot State University by using the links below:

- [Meet the Scientist – Dr. Mikhail Bobylev](#)
- [ND EPSCoR State-Funded Equipment Grants in Action](#)
- [360° Organic Chemistry Lab Tour at Minot State University](#)
- [Meet the Scientist – Dr. Khwaja Hossain](#)
- [360° Classroom Lab Tour at Mayville State University](#)
- [360° Biology Lab Tour at Mayville State University](#)
- [360° Classroom Lab Tour at Minot State University](#)

You can find more videos like this as we continue to highlight institutions across ND that partner with ND EPSCoR to build STEM capacity on the [ND EPSCoR YouTube channel](#). You can find details and videos of our earlier visit to Dickinson State University in News & Notes' [November issue](#). Videos from our prior visits to North Dakota State University and the University of North Dakota can be found in the [December issue of News & Notes](#).

Reaching out to K-12

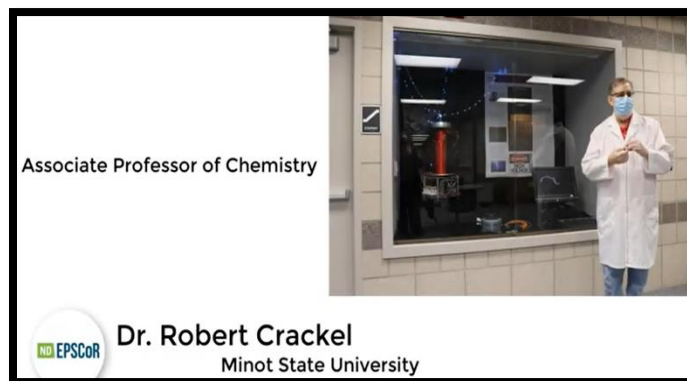
In 2019, working with the ND EPSCoR State Steering committee, ND EPSCoR began providing faculty and students from participating ND EPSCoR institutions the opportunity to compete for state funding for select projects, such as K-12 seed outreach. Awardees have come from across the state. The projects are designed to improve science, technology, engineering, and mathematics (STEM) education among K-12 students and build a pathway to careers in STEM.

ND EPSCoR thanks **Mikhail Bobylev** and **Robert Crackel**, both K-12 Seed awardees at Minot State University, for allowing our cameras to capture the impact of their K-12 outreach projects.

Bobylev, in conjunction with Velva Public Schools teacher and MiSU graduate, **Stephanie Sundhagen**, designed a research experience for high school students with state funding provided by an ND EPSCoR K-12 Seed Project grant. Sundhagen, now a physical science teacher at Velva High School, worked in Bobylev's organic chemistry lab for two and a half years, including time spent as a ND-EPSCoR INSPIRE-ND student researcher, before beginning her career in education. Sundhagen discusses the impact that engaging in a research experience had on her K-12 students in the video linked below.

Crackel, in collaboration with **Naomi Winburn**, an Assistant Professor in the Chemistry Department at Minot State University, designed and implemented STEM presentations at Community Learning Centers within local elementary schools.

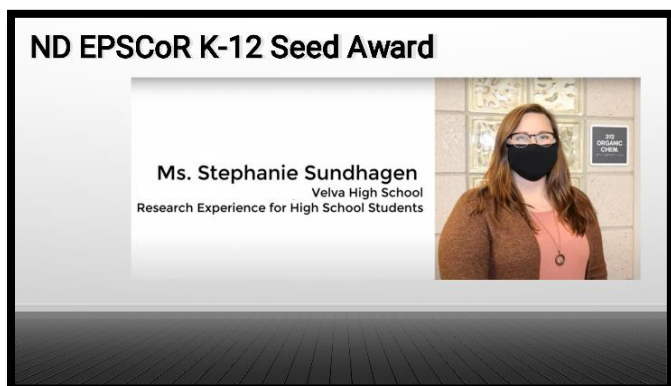
In the video linked below, Crackel discusses the importance of K-12 outreach in ND. The video features a Tesla Coil, which Crackel uses in his STEM presentations to local K-12 students.



Watch Winburn explain the power of hands-on STEM experiences on youth and the effect participating in such outreach has had on her university students in the video linked below.



You can find more information about how the ND EPSCoR State Office seeks to help improve STEM education and to build a pathway for students in North Dakota who are interested in pursuing careers in STEM disciplines on our [Education page](#).



NATURE Sunday Academy for 2020/21

By **Scott Hanson**, ND EPSCoR Tribal Colleges and Universities Liaison and NATURE Manager (right)



As we mentioned in [November's newsletter](#), this year's NATURE Sunday Academy activities are designed for middle-through high-school participants to do individually in their homes, in keeping with social distancing.

Janelle Smith, ND EPSCoR Business Manager, ordered the supplies for the modules. **Britt Heidinger and Julia Bowsher**, Co-coordinators of NATURE Sunday Academy, created the supply list, put the supplies for each activity into individual bags, and put all supplies for each participant into an individual box/kit.

Scott Hanson, ND EPSCoR Tribal Colleges & Universities Liaison and NATURE Manager, shipped kits to NHSC, SBC, and UTTC and delivered kits to CCCC and TMCC. At CCCC, TMCC, and UTTC, NATURE coordinators **Chris Dahlen, Austin Allard, and Mandy Guinn**, respectively, student participants will go to a central pick-up point to get their kits. However, since driving times are much longer on the Fort Berthold and Standing Rock Reservations, **Kerry Hartman**, NHSC NATURE coordinator, and **Mafany Ndiva Mongoh**, SBC NATURE coordinator, will hire individuals to distribute the kits to participants' homes.



do activities during spring break.

A total of 145 kits, each containing five informal STEM activities, will be distributed to participants for the 2020-2021 NATURE Sunday Academy program. This represents 725 potential engagements with middle and high school students in tribal communities.

NHSC, TMCC, and UTTC participants did their Sunday Academy activities in late December/early January during the semester break. CCCC will do one activity per month from January through May. SBC will

STTAR business applications open

By **Shireen Alemadi**, ND EPSCoR STEM Manager (right)



The Students in Technology Transfer and Research (STTAR) program, an ND EPSCoR State Office-sponsored, state-funded program, offers ND-based businesses the opportunity to cost-share student internship salaries during the summer of 2021. The applications for 2021 are now open.

ND companies and organizations get great students who use their academic training and expertise to help find solutions to technical challenges while sharing in the salary costs with the ND EPSCoR State Office. ND EPSCoR state-funded cost-sharing provides \$5 per hour toward the student's summer salary.

For students like **Blake Higgins** (pictured right) at **WCCO Belting Inc.**, Wahpeton, is the STTAR program provides an



opportunity to gain valuable work experience in the ND industry. A number of the 2020 employers noted that they often look to past interns when they have a full-time job opening in their companies. Funding is limited for 2021, and applications are accepted on a first-come, first-served basis. The qualifying criteria include:

- The business must be a ND company or have a ND-based office;
- The work/project must have a science, technology, engineering, or math focus for the internship; and
- The internship must be a minimum of eight weeks and a maximum of 12 weeks.

The ND EPSCoR contribution for the internship is up to \$2,400 per individual student. For more information, or to obtain a business partner application, please visit [the STTAR program webpage](#) or [email Shireen Alemadi](#).

Budget revisions

By **Janelle Smith**, ND EPSCoR Business Manager (right)



As we close the door on 2020, we are also closing the books on nearly all of the ND EPSCoR State Office state-funded STEM awards made during the fall of 2019.

When it became clear that COVID-19 would significantly impact the spring semester, the ND EPSCoR State Office extended many of these awards through December 15, 2020, to help researchers mitigate those impacts. In addition to the extension, many awards also had scope and budget revisions approved to help researchers manage the changing landscape. These revisions highlighted the flexibility and determination of the researchers to make the best of a challenging year.

As a reminder, final reports for these awards are due within 30 days of project completion. This means the reports for projects that closed on December 15 are due on January 15. There is no specific format for these final reports, but they should include the following: a summary of the work performed, project results, key accomplishments, challenges, and lessons learned. Be sure to include details about how the ND EPSCoR State Office funding enabled research activities that would not have otherwise been possible, impacted students, and resulted in additional grant funding applications as a result of what was learned through these awards.

These reports often serve as a lead for the ND EPSCoR Communication Manager, so don't be surprised if you get a follow-up message from **Cailin Shovkopyas** asking for an interview. Many great things are happening across the state, and it is always great fun to see some of these activities highlighted in the newsletter!

Events and trainings

ND EPSCoR State Conference



ND EPSCoR

www.ndepscor.ndus.edu

701-231-8400

Save the date for the ND EPSCoR Annual Conference on Wednesday, April 14, 2021. This conference will be a virtual event. **Dr. Pips Veazey**, Project Director, Alaska EPSCoR, will give a keynote address on Team Science. Also included in the conference will be synchronous presentations and panels. Topics include NSF RII Track-1 ND-ACES presentations, NSF II Track-1 INSPIRE-ND, Team Science, STEM-based Indigenous Knowledge, and the ABCs of Patents and Commercialization. Visit the [2021 ND EPSCoR Annual Conference webpage](#) to pre-register for this event, review poster submission guidelines, and to view the full agenda.

Responsible Conduct of Research (RCR)

RCR training with STEM Manager Shireen Alemadi is available upon request to augment our campus RCR requirements. Please [contact Shireen Alemadi](#) to schedule.

Activities of note

ND-ACES participants publish

Congratulations to the following ND-ACES faculty and student participants on their recent and upcoming publications:

- *Molecular mechanics of the swelling clay tactoid under compression, tension and shear*
Faisal, H.M. Nasrullah; **Katti, Kalpana S.**; **Katti, Dinesh R.** (November 2020, Applied Clay Science)
- *One-pot synthesis of graphene quantum dots using humic acid and its application for copper (II) ion detection*
Liu, Xiao; Han, Juan; Hou, Xiaodong; Altincicek, Furkan; Oncel, Nuri; Pierce, David; Wu, Xu; **Zhao, Julia Xiaojun** (March 2021, Journal of Materials Science)
- *Mechanobiological Evaluation of Prostate Cancer Metastasis to Bone using an In Vitro Prostate Cancer Testbed*
Molla, MD Shahjahan; **Katti, Dinesh R.**; **Katti, Kalpana S.** (January 2021, Journal of Biomechanics)
- *Nanostructured biomaterials for in vitro models of bone metastasis cancer*
Katti, Kalpana S.; Jasuja, Haneesh; **Katti, Dinesh R.** (March 2021, Current Opinion in Biomedical Engineering)

- *Composite nanoclay-hydroxyapatite-polymer fiber scaffolds for bone tissue engineering manufactured using pressurized gyration*
Kundu, Krishna; Afshar, Ayda; **Katti, Dinesh R.**; Edirisinghe, Mohan; **Katti, Kalpana S.** (January 2021, Composites Science and Technology)

Links to these publications can be found in the [National Science Foundation's \(NSF\) Public Access Repository \(PAR\)](#) or on [the ND EPSCoR website](#).

Funding opportunities

ND EPSCoR Rural Student Teaching Experience

The ND EPSCoR Rural Student Teaching Experience (RSTE) program provides unique learning experiences for up to two teacher candidates from the 10 ND EPSCoR ND-ACES RII Track-1 participating campuses – three Primarily Undergraduate Institutions (PUIs), one Master's College/University (MCU), four Tribal Colleges/Universities (TCUs) located in ND or the two Research Universities (RUs). The goal of the RSTE program is to provide an exceptional learning experience for teacher candidates in a rural school and community while they complete the requirements of their undergraduate programs. See the [Request for Applications](#) for details. Due to ND EPSCoR by noon on January 21, 2021.

Doctoral STEM Assistantship

ND EPSCoR ND-ACES Doctoral STEM Teaching Assistantship program is designed to increase NDSU/UND doctoral students' understanding of and experience in STEM teaching and research involving undergraduate students. These semester-long placements (Fall 2021 or Spring 2022) at a Tribal College/University (TCU), Primarily Undergraduate Institution (PUI), or Master's College/University (MCU) in North Dakota involve teaching and research duties under the direction of faculty research participants in ND EPSCoR's National Science Foundation (NSF)-funded New Discoveries at the Advanced Interface of Computation, Engineering, and Science (ND-ACES) project in the areas of materials design, cellular systems, or computational approaches. [Click here](#) for more information about ND EPSCoR's ND-ACES project. [Click here](#) for a list of ND-ACES faculty researchers at the TCUs, PUIs, and MCU. See the [Request for](#)

[Applications](#) for details. Due to ND EPSCoR by noon on March 11, 2021.

Distributed Research Experience for Undergraduates (dREU)

This program gives undergraduate students – from the nine ND EPSCoR ND-ACES RII Track-1 participating campuses - three Primarily Undergraduate Institutions (PUIs), one Master's College/University (MCU), three Tribal Colleges/Universities (TCUs) located in ND, or the two Research Universities (RUs) – the opportunity to work in the CCBSE alongside NSF Track-1 faculty researchers on their cutting-edge research projects. For more information, see the [Request for Applications](#). Open until filled.

NCUR Registration Fee Grant

Each year, the Council of Undergraduate Research (CUR) hosts the National Conference on Undergraduate Research (NCUR) to highlight all the great research conducted by undergraduate students across the country. Recently, CUR announced the 2021 NCUR conference will be a virtual event.

ND EPSCoR is excited to support student professional development in STEM and will fund the registration fee of 15 students (from ND EPSCoR participating institutions) who have their abstracts accepted by NCUR. Contact: shireen.alemadi@ndus.edu if you have questions about this opportunity.

Eligibility requirements for this grant:

1. Students need to email ndepscor@ndus.edu, using the subject [NCUR Student Registration], and stating their interest in this opportunity.
2. Students must submit their abstracts to NCUR by November 1 (for Early Decision) or December 1 (the final deadline).
3. Students must register for NCUR by January 31, 2021 (if their abstract is accepted).

Conference grants will be awarded by priority. Priority for this grant:

- 1st priority to students who have not had the privilege of previously presenting their research in any other venue.
- 2nd priority to ND-ACES and INSPIRE-ND students.
- 3rd priority goes to all other students.

Established Program to Stimulate Competitive Research (DOE EPSCoR) Implementation Grants

The DOE Established Program to Stimulate Competitive Research (DOE EPSCoR) hereby announces its interest in receiving new and renewal applications from eligible jurisdictions for Implementation Grants. Grants awarded under this program are intended to improve research capability through the support of a group of scientists and engineers, including graduate students and post-doctoral fellows, working on a common scientific theme in one or more EPSCoR jurisdictions. For more information, [please see the RFP](#).

- Pre-application (required) deadline: 5:00 pm Eastern Time on December 15, 2020
- Full application deadline: 11:59 pm Eastern Time on March 2, 2021.

NSF RII Track-2 Request for Proposal

EPSCoR Research Infrastructure Improvement Program: Track-2 Focused EPSCoR Collaborations (RII Track-2 FEC): There is a limit of a single proposal from each submitting organization. Each proposal must have at least one collaborator from an academic institution or organization in a different RII-eligible EPSCoR jurisdiction as a co-Principal Investigator (co-PI). For more information, [please see the program solicitation](#).

- Letter of intent (required) deadline: by 5:00 pm submitter's local time December 18, 2020
- Full proposal deadline: by 5:00 pm submitter's local time January 25, 2021

DEPSCoR Regional DoD Day

The Department of Defense (DoD) has asked the University of South Dakota to host a regional DEPSCoR DoD Day, where DoD program managers will provide information about the DEPSCoR program and general information about working with the DoD. The regional DEPSCoR Day will be held on a date to be determined in Vermillion, SD. For more information, please see: [DEPSCoR Regional DoD Day](#)

EPSCoR Workshop Opportunities

EPSCoR is designed to fulfill NSF's mandate to promote scientific progress nationwide, and NSF EPSCoR welcomes proposals for workshops in **Solicitation NSF 19-588**. These workshops focus on multi-jurisdictional efforts of regional to national importance related to EPSCoR's goals and NSF's mission. For more information, please see the RFP: [EPSCoR Workshop Opportunities](#)

Participating campus acronyms

- Master's College/University (MCU)
 - Minot State – Minot State University
- Primarily Undergraduate Institutions (PUIs)
 - DSU – Dickinson State University
 - Mayville State – Mayville State University
 - VCSU – Valley City State University
- Research Universities (RUs)
 - NDSU – North Dakota State University
 - UND – University of North Dakota
- Tribal Colleges/Universities (TCUs)
 - CCCC - Cankdeska Cikana Community College
 - NHSC – Nueta Hidatsa Sahnish College
 - SBC – Sitting Bull College
 - TMCC - Turtle Mountain Community College
 - UTTC – United Tribes Technical College

Stay in touch

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- Prior newsletters, http://bit.ly/EPSCoR_Newsletters
- Submit stories to: <https://bit.ly/epscorsubmitnews>
- To be added to the newsletter mailing list, please email ndepscor@ndus.edu, subject line: newsletter.

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