

## Spring renewal brings renewed energy and perspective

A change in seasons often brings with it a transformed perspective and a new energy. At this point in the Spring Semester, schedules can be packed as we have reached the midway point. However, I hope there will be plenty of moments for each of you to enjoy warmer weather as the spring season approaches. Now is the time to take advantage of renewed energy and a fresh perspective.

The change in seasons is a chance for needed reflection – a time for revitalization as we approach the end of another academic year. The challenges of the past two years of the global pandemic make it even more fitting for this spring to be a season of new perspectives and energy.

Embracing the timeline of a seasonal change offers a natural time to revisit our own personal and professional goals. In addition, the refreshing energy of spring makes it an opportune time to dust off goals and resolutions that have fallen by the wayside since the beginning of the year.

Also, this spring season, we will wrap up the 2021-2022 Nurturing American Tribal Undergraduate Research and Education (NATURE) Sunday Academy sessions. In an upcoming issue of News & Notes, we will share the wide variety of NATURE programs being offered this summer. The NATURE program is a North Dakota EPSCoR State Office-sponsored education outreach project. NATURE aims to improve STEM education among middle school, high school, and tribal college students and build a pathway for American Indians living in North Dakota interested in pursuing careers in STEM disciplines.

NATURE builds on a long-term collaboration between tribal colleges in North Dakota, North Dakota State University, and the University of North Dakota. NATURE programs are currently funded by the State of North Dakota and the National Science Foundation EPSCoR Track-1 Cooperative Agreement OIA #1946202.

You can read more about Sunday Academy [on page two of this issue](#) and learn about our exciting new STEM

at Home NATURE Extension video series [on page three of this issue](#).

The hybrid ND EPSCoR Annual Conference is another opportunity for a change in energy this season. This year's research and outreach celebration will be offered virtually on our Symposium platform and in person at the Alerus Center in Grand Forks, ND, on Wednesday, April 6. The conference will feature the impact of the research of ND EPSCoR's current NSF cooperative agreement ND-ACES and the extensive outreach efforts. The conference has many exciting sessions planned—[register](#) to join us virtually or in person. If you are planning to join us at the Alerus Center, you must register by noon on Friday, March 18.

The ND EPSCoR annual conference allows for many EPSCoR-funded participants to talk about their work over the past year. Similarly to last year's virtual conference, students from across ND, outside of EPSCoR projects, have the opportunity to present virtual posters on their research efforts and engage with attendees about their work using a comments feature on each academic poster's webpage. We invite you to engage with student and faculty poster authors in the weeks leading up to the conference via our virtual platform.

As we enter spring, we celebrate faculty and student research impacts across our state. Please join us for the hybrid 2022 ND EPSCoR Annual Conference at the Alerus Center in Grand Forks on April 6, 2022 and on our Symposium virtual platform.

Visit [our state conference information page](#) for details. I hope that you are, and will continue to be, well.

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



## NATURE Sunday Academy generates interest at Nueta Hidatsa Sahnish College

The Nurturing American Tribal Undergraduate Research and Education (NATURE) Sunday Academy program for the 2021-2022 school year began in October and will continue through next month. The Sunday Academy Program generates interest in STEM among American Indian students. Once a month during the academic year, middle and high school students are brought together to explore practical day-to-day problems involving STEM, requiring them to analyze the situation and seek potential solutions.

Sunday Academy sessions are held at each of the participating Tribal Colleges/Universities (TCUs) and are hosted by TCU STEM faculty, who serve as the NATURE Coordinator at each site. Activities usually begin at 10, or 11:00 am and last up to four hours, including lunch. Cultural relevance and hands-on activities are emphasized in all topic areas. Sessions are developed and delivered by TCU, North Dakota State University (NDSU), and University of North Dakota (UND) faculty.

This month, **Raymond Burns**, ND EPSCoR State Office Tribal Partnerships Manager, visited Nueta Hidatsa Sahnish College to see **Alexander Parent's** (NDSU) "Counting Equilibrium" activity. You can read more about Parent's activity in our [November 2021 edition of News & Notes](#).

At Nueta Hidatsa Sahnish College, eight secondary students attended this month's Sunday Academy. **Ann Vallie**, PEEC Director/Pre-Engineering Faculty at Nueta Hidatsa Sahnish College, was also on site to support students at Sunday Academy.

"The students loved the computer simulation," noted Burns. Even after the Sunday Academy activities had formally ended, many participating students continued to work with the computer simulation. "The students really enjoyed all of the activities" Burns added.

Sunday Academy is a unique opportunity to expose students to a college environment. The students enjoy touring the facilities while also participating in STEM activities in a real college lab. **Kerry Hartman**, NATURE Site Coordinator for Nueta Hidatsa Sahnish College and ND-ACES Cellular Systems at Materials Interface Pillar researcher, hosts all of the Sunday Academies in his lab at NHSC.

The NATURE Sunday Academy program offers advanced science and technology demonstrations, like this one, to students monthly during the academic year.

The dedication by faculty and staff to deliver this programming on a Sunday is one of the most impressive parts of the over-two-decades old Sunday Academy program. Sunday Academy would not be the successful outreach program that it is without the dedicated NATURE site coordinators at each participating TCU.



*"Counting Equilibrium," Sunday Academy activity author Alexander Parent, helps students with the activities at NHSC.*

The NATURE Sunday Academy programs are led by co-coordinators, **Julia Bowsher** and **Britt Heidinger** (both associate professors in Biological Sciences at NDSU). You can also visit our [NATURE Sunday Academy page](#) for additional information. Sunday Academy is one of four NATURE program components. Planning is currently underway for the other three components (TCU Summer Camps, Bridge Camp, and University Summer Camp), which will run in June and July. For more information about our NATURE program, contact Raymond Burns, the ND EPSCoR State Office Tribal Partnerships Manager, by [email](#) or calling 701-231-8606.

## Tribal Partnerships Manager visits colleges around the state

This month, **Raymond Burns**, ND EPSCoR State Office Tribal Partnerships Manager traveled around the state visiting Nueta Hidatsa Sahnish College (NHSC), Cankdeska Cikana Community College (CCCC), and Turtle Mountain Community College (TMCC). Burns, who assumed The Tribal Partnerships Manager role with ND EPSCoR in January, visited faculty, NATURE Site Coordinators, administrators, and staff at each Tribal College/University.

At NHSC, Burns had the opportunity to join the Sunday Academy students as they enjoyed **Alexander Parent's** "Counting Equilibrium" activity. Burns was also

able to meet with **Kerry Hartman**, an ND ACES Cellular Systems at Materials Interface Pillar researcher and the NHSC NATURE Site Coordinator.



*Raymond Burns, ND EPSCoR Tribal Partnerships Manager, visits NHSC for Sunday Academy on March 6, 2022.*

Next in his travels, Burns visited TMCC where he connected with staff and administrators. TMCC also hosts Sunday Academy activities during the academic year with NATURE Site Coordinator, **Austin Allard**. Allard is an ND-ACES Materials Design at Biointerfaces Pillar researcher.



*Turtle Mountain Community College.*

At CCCC, another NATURE Sunday Academy site, Burns met with **Brent Voels**, an ND-ACES Materials Design at Biointerfaces Pillar researcher and the NATURE Site Coordinator for CCCC. Contact Raymond Burns, the ND EPSCoR State Office Tribal Partnerships Manager for information about NATURE by [email](#) or calling 701-231-8606.

## The STEM at Home video series continues with NATURE extensions

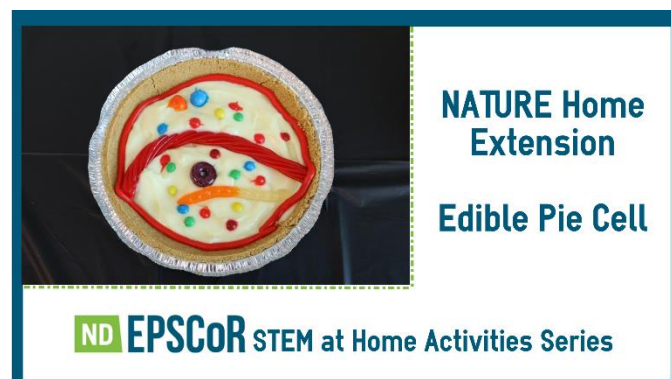
By **Makenzie Stockwell** (NDSU), ND EPSCoR State Office Student Worker

This month, the ND EPSCoR State Office introduced new videos to the STEM at Home series on our YouTube channel. This series will be incorporating NATURE Sunday Academy activities into the STEM at home videos. Our STEM at Home series is a video-based learning series that creates fun content centered on projects which incorporate science, technology, engineering, and math (STEM). These simple projects provide an opportunity for younger audiences to use critical thinking skills and potentially spark a lifetime interest in STEM.

This new branch of the series will extend the Sunday Academy program for secondary students to appeal to younger age groups by providing fun experiments for the home. The Sunday Academy program gives secondary students engaging, hands-on STEM activities authored and facilitated by college professors at sessions held once a month during the academic year participating TCUs. The STEM at Home NATURE Extension videos will be taking experiments done at the secondary level and simplifying them to excite and engage a younger audience. Each video in this series is accompanied by a list of simple materials and goes through a step-by-step process for completing the project successfully.

Through this video series, we hope to create a fun and easy way for families to engage in Sunday Academy STEM projects together.

To kick off our series, we will be releasing a video based on the all sites activity featured in the [February 2022 edition of News & Notes](#), "The Spectacular Cell," authored by **Lori Gourneau** (CCCC).



Get the complete shopping list for the NATURE Home Extension Edible Pie Cell activity [here](#).

[Subscribe to our YouTube channel](#) and visit our [STEM activities page](#) for shopping lists. You can also visit our [STEM Education Portal](#) and [NATURE Sunday Academy](#) pages for more activities and lesson plans that strengthen the STEM pathway for students across ND.

## CIRCLES Alliance survey and interview opportunities

In October 2020, the ND EPSCoR State Office joined five other EPSCoR states (Idaho, Montana, New Mexico, South Dakota, and Wyoming) in a National Science Foundation-funded collaborative research project that forms an Alliance to connect with tribal community members within those states to gain a better understanding of each community's definition and perspective of STEM (science, technology, engineering, and mathematics). Initially, Alliance members planned to visit each tribal community, but with the COVID pandemic continuing, the Alliance has decided to continue to make virtual connections.

Using a common set of questions across the six-state CIRCLES (Cultivating Indigenous Research Communities for Leadership in Education and STEM) Alliance, participants input is being gathered through virtual interviews over Zoom or through an online survey with tribal community stakeholders to gain their perspective on how indigenous based STEM education is currently being incorporated or might be incorporated in the future, to support student STEM learning. To participate in an interview or survey, you must be 18 years or older.

The ND EPSCoR State Office has created a [link to a 90-second video](#) that describes these efforts. The anonymous online survey is [available at this link](#). Additionally, ND EPSCoR is conducting individual virtual interviews. If you would prefer to participate in an individual interview, please contact ND EPSCoR at [ndepscor@ndus.edu](mailto:ndepscor@ndus.edu), or call 701-231-8400.

This effort aims to foster better connections with tribal communities and support STEM educational programming. Working toward that goal, the ND EPSCoR State Office humbly requests your assistance in completing this survey or contacting us to set up a virtual interview. The CIRCLES Alliance believes this is a particularly poignant time to reflect on observations regarding indigenous based STEM education as the COVID pandemic has brought some new challenges into focus. Learn more about the [North Dakota CIRCLES effort here](#).

## News of note

ND-ACES student participant, Yingfen Wu, receives first place at UND Graduate Research Achievement Day

ND-ACES Materials Design at Biointerfaces Pillar student researcher **Yingfen Wu** (UND; pictured right) was awarded first place in the Natural Sciences category of the University of North Dakota's Graduate Research Achievement Day. Wu is a graduate student in the Chemistry Department advised by **Julia Xiaojun Zhao** (UND). Congratulations!



ND-ACES participants publish

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

- *A Hybrid Continuum-Particle Approach for Fluid-Structure Interaction Simulation of Red Blood Cells in Fluid Flows*  
**Le, Trung** (Fluids)
- *High-Fidelity Simulation of Flows in Bone-Like Environment to Investigate the Growth of Cancer Cells*  
**Le, Trung** (ASME Conference Proceedings)
- *Novel Sensitivity Method for Evaluating the First Derivative of the Feed-Forward Neural Network Outputs*  
**Yellavajjala, Ravi Kiran;** and Darland, Diane (Journal of Big Data)
- *Nanozymes—Hitting the Biosensing “Target”*  
**Zhao, Julia Xiaojun;** and **Wu, Yingfen** (Sensors)
- *Synthesis of Highly Near-Infrared Fluorescent Graphene Quantum Dots Using Biomass-Derived Materials for In Vitro Cell Imaging and Metal Ion Detection*  
**Reagen, Sarah; Wu, Yingfen; Combs, Colin; Zhao, Julia Xiaojun;** Liu, Xiao; Shahni, Rahul; Bogenschuetz, Jacob; Wu, Xu; Chu, Qianli R.; Oncel, Nuri; Zhang, Jin; Hou, Xiaodong; and Vasquez, Antonio (ACS Applied Materials & Interfaces)
- *A Novel Sensitivity-based Method for Feature Selection*  
**Lavadiya, Dayakar Naik; and Yellavajjala, Ravi Kiran** (Journal of Big Data)
- *Targeting Estrogen Receptor-Positive Breast Microtumors with Endoxifen-Conjugated,*

*Hypoxia-Sensitive Polymersomes*

**Mallik, Sanku; Mamnoon, Babak; Choi, Yongki;** Feng, Li; Froberg, James; Venkatachalem, Sathish; Taratula, Olena; and Taratula, Oleh (ACS Omega)

- *Polymeric Composite Matrix with High Biobased Content as Pharmaceutically Relevant Molecular Encapsulation and Release Platform*  
**Mallik, Sanku; Mamnoon, Babak; Quadir, Mohiuddin; Nair, Gauthami;** Hajra, Raj Shankar; Dutta, Debasmita; Knight, Austin; Ganai, Sabha; Reindl, Katie; and Jiang, Long (ACS Applied Materials & Interfaces)
- *Beta-Sheet Richness of the Circulating Tumor-Derived Extracellular Vesicles for Noninvasive Pancreatic Cancer Screening*  
**Xia, Wenjie; Khan, MD Rakib Hasan;** Rasuleva, Komila; Elamurugan, Santhalingam; Bauer, Aaron; Wen, Qian; Li, Zhaofan; Steen, Preston; Guo, Ang; Mathew, Sijo; Jansen, Rick; and Sun, Dali (ACS Sensors)
- *A Heuristic Strategy for Multi-Mapping Reads to Enhance Hi-C Data*  
**Liu, Lu;** and **Bulathsinghalage, Chanaka Sampath Cooray** (2021 IEEE 21st International Conference on Bioinformatics and Bioengineering)

## Events and trainings

### ND EPSCoR 2022 State Conference

Wednesday, April 6, 2022  
Alerus Center in Grand Forks, ND

The 2022 ND EPSCoR Annual Conference will be a hybrid event on Wednesday, April 6, 2022, at the Alerus Center in Grand Forks, ND or virtually via our Symposium platform. The ND EPSCoR Conference is an annual event that brings together faculty, students, and the community to celebrate the STEM endeavors taking place within ND EPSCoR's participating institutions. Accommodation is available at the [Canad Inn](#) and surrounding hotels.

[Register here](#). This registration link is for both virtual content access and in-person attendance. **If attending in person, please register by noon, this Friday, March 18, 2022.**

[View the agenda here](#).

Additional resources for presenters are available on [our templates and information page](#). Visit the [ND EPSCoR State Conference information page](#) for additional details.



### Education Pathways for Careers in STEM ND-ACES Virtual Science Café

ND EPSCoR ND-ACES presents a special virtual science café for secondary students, educators, and families on Wednesday, March 30<sup>th</sup> at 3:00 pm Central Time. Learn more about this event and the ND-ACES Science Café series [here](#).

### EPSCoR Workshop on Artificial Intelligence

Mark your calendars for our upcoming EPSCoR Workshop, taking place in person April 3-4 in Downtown Little Rock, Arkansas. The topic is Artificial Intelligence & No-Boundary Thinking ([award page link](#)). Travel support for attendees from EPSCoR jurisdictions is available on a first-come basis until March 18. Registration and more info can be found here: <https://www.astate.edu/a/cnbt/workshop/>

### Responsible Conduct of Research (RCR)

RCR training is available upon request to augment initial campus or Collaborative Institutional Training Initiative (CITI) RCR trainings. Please [get in touch with ND EPSCoR](#) to schedule.

## Funding opportunities

Funding Opportunities come from three sources:

1. The National Science Foundation (NSF)-funded New Discoveries at the Advanced Interface of Computation, Engineering, and Science (ND-ACES) RII Track-1 cooperative agreement, which consists of two broad components: 1) Center for Cellular Biointerfaces in Science and Engineering (CCBSE), which consists of three research pillars: materials design, cellular systems, and computational approaches and 2) PROMoting Sustainable Partnerships in Education and Research (PROSPER),

which consists of four connected project elements: education and workforce development, broadening participation, partnerships, and collaborations, and communication and dissemination.

2. ND EPSCoR State Office
3. [EPSCoR and EPSCoR-like federal funding agencies](#), which include: Department of Energy (DOE), National Aeronautics and Space Administration (NASA), National Institutes of Health (NIH), NSF, U.S. Department of Agriculture (USDA), and Department of Defense (DoD).

#### Undergraduate Research Assistantship (URA) Program

This program gives current junior and senior undergraduate students pursuing a B.S. STEM degree at a four-year institution (or a two-year institution granting B.S. STEM degrees) an opportunity to perform research within the National Science Foundation (NSF)-funded New Discoveries in the Advanced Interface of Computation, Engineering, and Science (ND-ACES) Center for Cellular Biointerfaces in Science and Engineering (CCBSE).

The URA is a six-month award that is renewable for up to one additional year. URA awardees will conduct up to 18 months of research under the direction of an ND-ACES CCBSE researcher. For more information, see the [Request for Applications](#).

Application Deadline: Open until funds are exhausted

#### Distributed Research Experience for Undergraduates (dREU)

Under this program, 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) – are required to work in the ND-ACES Center for Cellular Biointerfaces in Science and Engineering (CCBSE) alongside NSF Track-1 faculty researchers on their CCBSE cutting-edge research projects in materials design, cellular systems, or computational approaches. Women, minorities underrepresented in STEM, persons with disabilities, first-generation college students, economically disadvantaged, or rural populations are strongly encouraged to apply. For more information, see the [Request for Applications](#).

Application Deadline: Open until funds are exhausted

#### EPSCoR Research Infrastructure Improvement Program: Bridging EPSCoR Communities (RII-BEC)

The Established Program to Stimulate Competitive Research (EPSCoR) is designed to fulfill the mandate of the National Science Foundation (NSF) to promote scientific progress nationwide. Jurisdictions are eligible to participate in the NSF EPSCoR Research Infrastructure Improvement (RII) Program based on their level of total NSF support over their most recent five years. Through this program, NSF facilitates the establishment of partnerships among academic institutions and organizations in governmental, non-profit, and commercial or industrial sectors that are designed to effect sustainable improvements in a jurisdiction's research infrastructure, Research and Development (R&D) capacity, and hence, its R&D competitiveness. For details, [see the program solicitation](#). Please be aware that some campuses may have internal guidelines related to this RFP.

Proposals are due April 4, 2022

#### NSF EPSCoR Research Fellows FY 2022 RII Track-4

The FY 2022 RII Track-4 solicitation has been released. The NSF EPSCoR Research Fellows funding opportunity, under solicitation [NSF 22-573](#), has a deadline of May 12, 2022. This initiative provides early career investigators the opportunity to travel to a host site to establish or strengthen research collaborations, learn new techniques and / or access state of the art facilities.

RII Track-4:FAST Matching: The solicitation also highlights the RII Track-4:FAST track where nontenured PIs from selected institutions can conduct research activities a participating NASA Research center. These institutions include Minority Serving Institutions, Primarily Undergraduate Institutions, Two-Year Colleges, Women’s Colleges and Institutions Primarily Serving Students with Disabilities.

EPSCoR Virtual Office Hours: NSF EPSCoR will also host multiple office hour sessions where PI’s may meet with program officers to address questions and/or seek clarification. Please Submit questions in advance to [cwhitley@nsf.gov](mailto:cwhitley@nsf.gov)

Office Hour Dates—all times at 3:00PM ET

- March 17, 2022
- March 24, 2022
- April 14, 2022
- April 21, 2022

While real time captioning will be available, requests for additional accommodations may be sent to [cwhitley@nsf.gov](mailto:cwhitley@nsf.gov) 14 days in advance.

Register in advance for this webinar:

[https://nsf.zoomgov.com/webinar/register/WN\\_xyqCYk\\_u0Qg-66Xag5F9djA](https://nsf.zoomgov.com/webinar/register/WN_xyqCYk_u0Qg-66Xag5F9djA)

After registering, you will receive a confirmation email containing information about joining the webinar.

#### Department of Defense: 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 in Spring of 2022 in Vermillion, SD. For more information, please see:

[DEPSCoR Regional DoD Day](#)

#### NSF: EPSCoR Workshop Opportunities

EPSCoR is designed to fulfill NSF's mandate to promote scientific progress nationwide, and NSF EPSCoR continually 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](#)

## Acronyms

Participating Institutions:

- 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

Funding:

- National Science Foundation (NSF) EPSCoR Research Infrastructure Improvement (RII) Track-1 Collaborative Agreements

- ND-ACES – New Discoveries in the Advanced Interface of Computation, Engineering, and Science (NSF OIA #1946202)
- NSF Collaborative Research
  - CIRCLES Alliance - Cultivating Indigenous Research Communities for Leadership in Education and STEM Alliance (NSF OIA #2038196)
- ND EPSCoR State Office
  - STEM programming identified within the newsletter and state match funding for ND-ACES

## Acknowledgement

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

## Stay in touch

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