



***IN OUR GRIT,
OUR GLORY™***

RESEARCH AT
NEBRASKA

2021-2022 REPORT

2021-2022

NEBRASKA RESEARCH REPORT



This report is available online:
research.unl.edu/annualreport/2022



About the Cover

Illustrator Joel Brehm created a visual representation of a simulated particle collision event within the Compact Muon Solenoid detector. A University of Nebraska-Lincoln physics team earned a \$51 million National Science Foundation grant to lead the NSF-funded portion of the U.S. CMS Operations Program. Nebraska physicists helped develop the circular tracker in the center of the illustration. The tracker's cylinder is partially cut away to show a collision. Special thanks to Matevz Tadel of the University of California, San Diego, and Ken Bloom, Nebraska physicist, for their scientific consultation and expertise.

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FROM THE VICE CHANCELLOR

Leadership, Commitment Reflect Husker Pride

At the University of Nebraska-Lincoln, we know that great people are behind every headline-making accomplishment.

In four years as vice chancellor, I've had ample opportunities to witness how Husker pride runs deep in our university's DNA. It's about more than talent and expertise – though our faculty share those attributes, too. The difference is Huskers' willingness to collaborate, mentor and define success in their research and creative endeavors.

That's why leadership is the focus of this Research Report. We are proud to offer unique leadership development programs at the early- and mid-career levels. In this report, you'll learn about people who are leveraging these programs to grow their careers and the university's capacity. It also features stories about accomplished researchers who have positively shaped the culture of their departments and colleges, mentoring rising scholars and students along the way.

The cover story on pages 4-5 features a \$51 million award from the National Science Foundation to lead the NSF-funded portion of the U.S. CMS Operations Program. Being selected to steer this

international effort results from years of work and leadership by Nebraska's particle physics team.

Breakthroughs are rarely the result of a single published journal article or artistic performance. Huskers put in the effort – day after day, year after year, decade after decade – to advance their research and creative endeavors. Although individual accolades are important, I'm continually impressed by the faculty's drive to benefit society through their work.

Addressing today's societal challenges requires novel approaches in research, teaching and outreach. Increasing impact through research and creative activity is one of six core aims of the N2025 Strategic Plan, Nebraska's roadmap for evolving as a 21st century land-grant institution. To that end, the university is investing \$40 million in strategic, goal-oriented solutions through the Grand Challenges Initiative, designed

to leverage Nebraska's strengths and expertise in seven thematic areas. A progress report is available on page 43.

Nebraska is committed to advancing progress in anti-racism and racial equity. We are continually examining how we can best support our research community and remove potential barriers to success for individuals of all backgrounds.

Our people make the place. I am excited to share the ways Huskers are thriving as scholars and leaders.

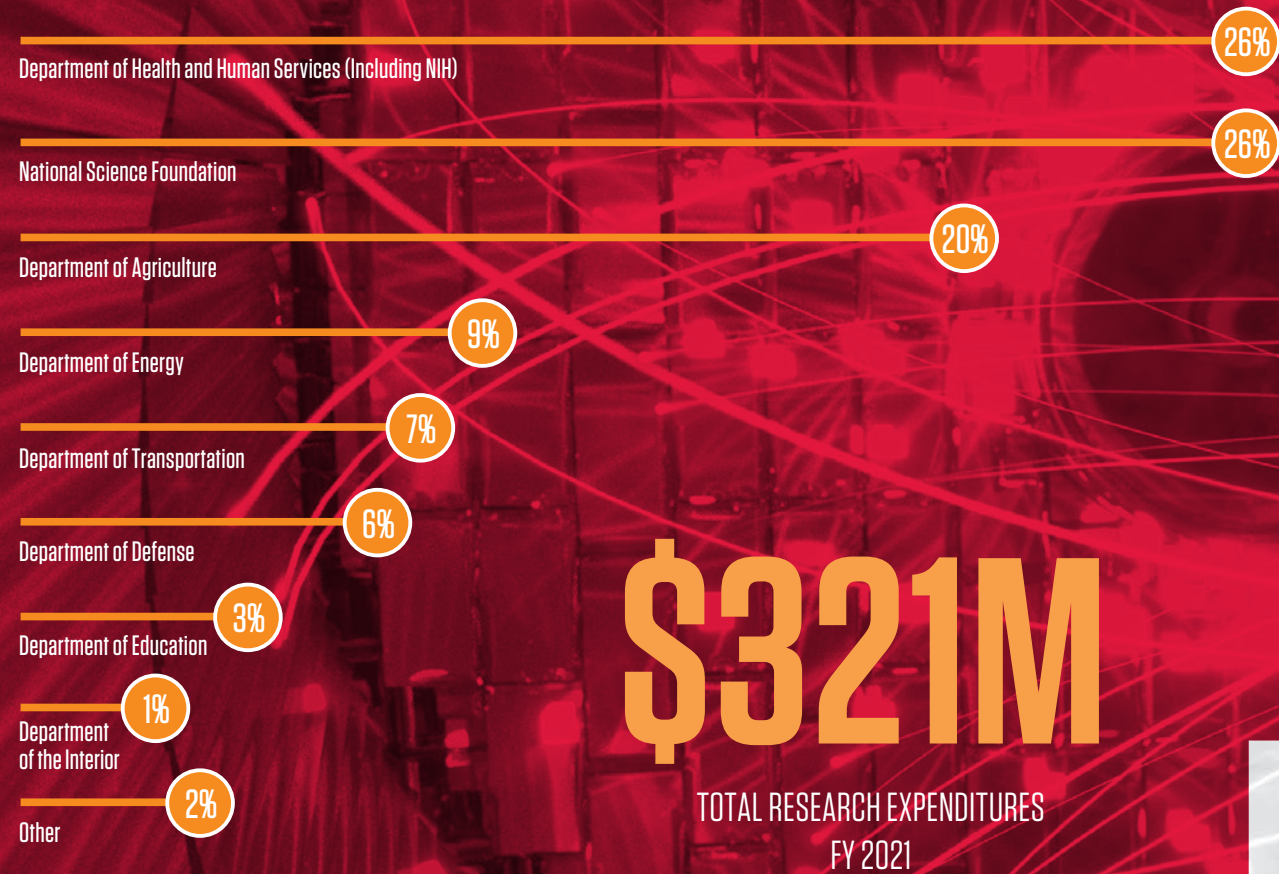


Robert "Bob" Wilhelm
Vice Chancellor for Research
and Economic Development



Nebraska Research and Economic Development at a Glance

FY 2021 FEDERAL RESEARCH EXPENDITURES BY AGENCY



Nebraska Innovation Campus figures reflect the most current information at the time of publication. Updated figures may be available at innovate.unl.edu.

31%

INCREASE IN RESEARCH EXPENDITURES
OVER THE PAST 10 YEARS

\$328.9M

CUMULATIVE ECONOMIC
IMPACT OF NEBRASKA INNOVATION
CAMPUS INVESTMENTS

2,127

JOBS CREATED STATEWIDE BY
NEBRASKA INNOVATION CAMPUS

58

DIVERSE PUBLIC- AND
PRIVATE-SECTOR PARTNERS AT
NEBRASKA INNOVATION CAMPUS

88

STUDENT INTERNSHIPS
FUNDED BY NEBRASKA
INNOVATION CAMPUS

\$19.8M

INDUSTRY-SPONSORED RESEARCH
EXPENDITURES, FY 2021

NO. 64

UNIVERSITY OF NEBRASKA RANKING
AMONG THE TOP 100 ACADEMIC INSTITUTIONS
RECEIVING U.S. PATENTS;
RANKED FOR THE FIFTH CONSECUTIVE YEAR

\$6.36M

LICENSING INCOME IN FY 2022

1,560

SPONSORED RESEARCH
AWARDS, FY 2021

1.5M

SQUARE FEET OF SPACE
FOR RESEARCH

RESEARCH LEADERSHIP

Advancing International Subatomic Physics Research

Since CERN's Large Hadron Collider began smashing subatomic particles in 2008, scientists with the Compact Muon Solenoid collaboration have made remarkable discoveries about the very nature of matter and our universe.

More than 1,000 papers outlining these discoveries, including the landmark finding of the Higgs boson particle in 2012, are the most visible accomplishments from the Switzerland-based LHC, the world's largest, most powerful particle accelerator. Within the LHC is the CMS detector, which enables scientists to study what happens when high-energy particles collide.

Such discoveries depend on a crucial underlying task: maintaining operations of the CMS detector, a building-sized instrument that records a remarkable 1 terabyte of data per second.

With a five-year, \$51 million grant from the National Science Foundation, UNL now leads the NSF-funded portion of the U.S. CMS Operations Program. The program is responsible for managing U.S.-based CMS components, overseeing the software and computing infrastructure, and planning future upgrades.

"A successful research program is built on a successful operations program," said Ken Bloom, principal investigator and professor of physics.

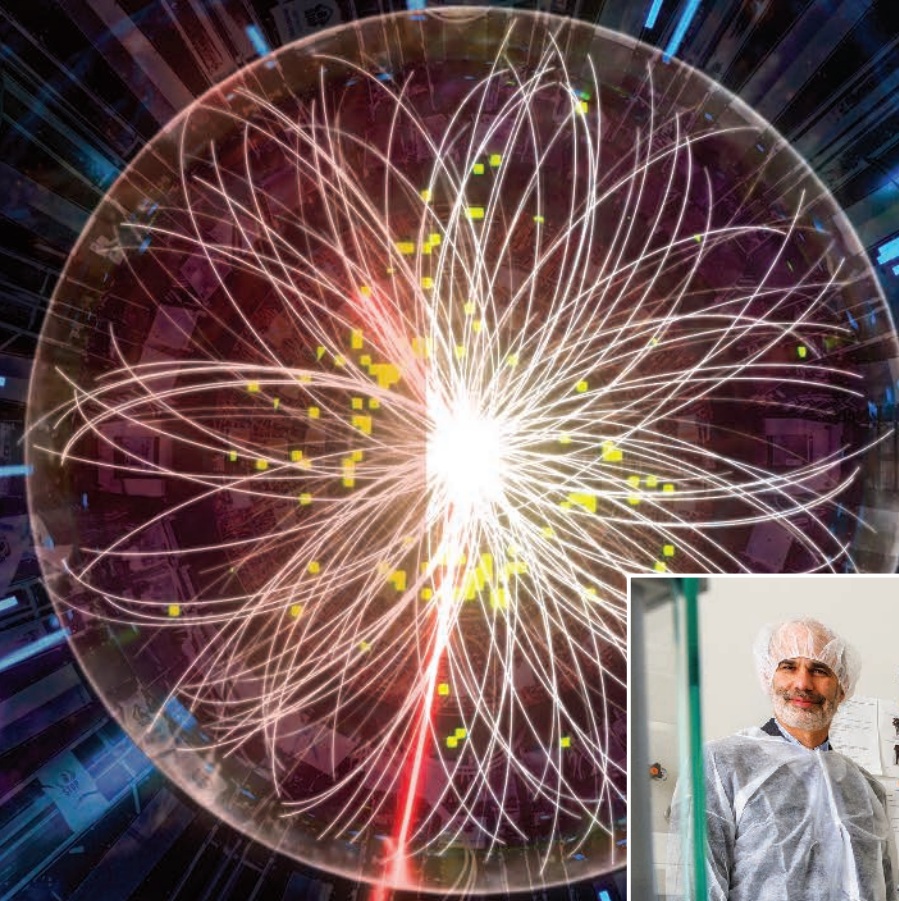
Nebraska will distribute funds to 19 partner institutions, all leaders in particle physics, including the Massachusetts Institute of Technology, Princeton and Cornell.

The grant – one of the largest in university history – caps Nebraska's and Bloom's more than 30 years of contributions to the LHC. This work started in the early 1990s, when Husker physicists launched initial research related to the instrument. In 2005, Nebraska's Holland Computing Center became one of seven CMS Tier-2 computing sites in the U.S., which manage data that physicists use worldwide.

Bloom led the Tier-2 grid for nearly a decade. From 2015 to 2019, he served as software and computing manager for the operations program. Then in January 2021, he took over as the program's deputy manager, which brought the NSF funding to Nebraska.

"At Nebraska, our research in physics has been a strength for decades, and this NSF grant recognizes that, along with our demonstrated ability to provide leadership on the international stage," Chancellor Ronnie Green said.

This year, the LHC launched its third run of data collection, which will double the size of the CMS dataset. Scientists continue to explore the Higgs boson particle, dark matter and other unknown aspects of the universe.



From left: Nebraska physicists Ken Bloom, Frank Golf, Ilya Kravchenko and Dan Claes conduct research alongside national and international counterparts at CERN. Their work has helped solidify Nebraska's leadership in physics research.



RESEARCH LEADERSHIP

Preparing the Next Generation of Research Leaders

To successfully lead research programs and interdisciplinary projects, faculty need to develop skills beyond their discipline, including business acumen, management and leadership. The Office of Research and Economic Development supports faculty through innovative programs designed to prepare the next generation of research leaders.

“Emphasis on research leadership is one of the cornerstones of our work,” said Bob Wilhelm, vice chancellor for research and economic development. “It’s not enough to be at the top of your game just in pure research or creative activity. We have intentionally made research leadership a focus, and we’re excited to see it paying dividends for our faculty and the university.”

Two programs – the Research Development Fellows Program and the Research Leaders Program – give faculty tools to further develop their strengths, build relationships across disciplines and recognize opportunities for collaboration.

Nebraska aims to reach faculty at each career stage, Wilhelm said. The Fellows program helps faculty jump-start their research programs. The Leaders program prepares mid-career and experienced researchers to develop and lead multidisciplinary teams in the pursuit of major external funding. Together, Wilhelm said, the programs underscore the fact that the world’s most challenging problems – including the issues addressed in the university’s seven Grand Challenges – require the best talent that can be assembled, talent that spans many disciplines.

The Leaders program, now in its third year, is believed to be the first leadership development program in the Big Ten, and among the first nationally, to focus on research, said Nathan Meier, assistant vice chancellor for research.

The goal, Wilhelm said, is to create a campus culture that is committed to increasing the impact of research and creative activity, a key aim of the university’s N2025 strategic plan.

Rising Research Leaders

Carrie Heitman

Anthropologist Carrie Heitman was selected for the Fellows program after joining Nebraska in 2013 and was part of the Research Leaders inaugural class in 2020.



Carrie Heitman

Early in her career, Heitman was seeking guidance in visualizing what an R1, or top tier, research program could look like and how she could build the impact and scope of her work. Through the Fellows program, she learned about the research support available at Nebraska and developed a network of trusted peers.

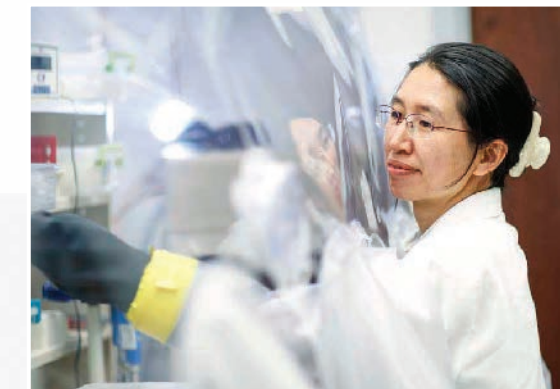
“Being surrounded by so many accomplished people really ups your game. They’re all aiming high,” said Heitman, associate professor in the School of Global Integrative Studies.

It also helped her develop a vision for her research program that extends beyond shorter-term tasks like writing journal articles and applying for grants, she said.

“Having the space to do this kind of visioning – which is not work I would have known how to structure or how to prompt myself to do – was really helpful,” Heitman said.

Limei Zhang

For Limei Zhang, the chance to hone her strengths was an unexpected benefit of the Leaders program. Through a partnership with the Center for Executive and Professional Development in the College of Business, faculty in the Leaders program explore the Clifton Strengths Institute’s talent assessment program.



Limei Zhang

“I thought I knew myself very well. I’m a researcher. I study myself and I study others,” she said. Zhang was able to reflect on how she could harness her personality and tendencies – she identifies as a strong introvert – to build her research program and better communicate its impact.

Zhang also discovered the potential of research collaborations with faculty she otherwise wouldn’t have had opportunities to meet.

“They think differently than I do, and it’s really beneficial to all of us,” said Zhang, associate professor of biochemistry.

Tomas Helikar

Several participants pointed out that successful researchers must develop skills beyond the science they love and have trained for if they are to successfully build a program.

“When we get our Ph.D.s and get our postdocs done, the focus is about the science and doing research,” said Tomas Helikar, Susan J. Rosowski Associate Professor of Biochemistry. “But as soon as we start our first tenure-track position, we apply our scientific skills day to day less and less, and need to use skills related to people management and



Tomas Helikar

marketing and sales and so on. We become CEOs of these microinstitutions within the university.”

Hiring, making budgets, planning and other management skills are essential, said Helikar, selected for both the Fellows and Leaders programs.

“It was designed to make you think big in terms of your research program and how to become a leader in that context,” Helikar said.

Helikar’s work is featured on page 16.



Rising Research Leaders

Maital Neta

Like many midcareer professionals, Maital Neta was asking herself: “What’s next?”

She had participated in the Fellows program earlier in her career and already had experience leading funded projects, including one through the National Institute of Mental Health and another through the National Science Foundation’s Faculty Early Career Development Program. Neta, the Carl A. Happold Associate Professor of Psychology, hoped to create a broader framework for accomplishing her research goals. The Leaders program helped her do that.



Maital Neta

“It was fantastic for that,” she said. “We’re all so busy, and we have so many immediate demands on our time. It’s really hard to create the space to think about those questions and follow through. It forced me to devote the time to that.”

Neta is particularly excited to have learned how to create research teams.

“That is a really important part of what makes someone a leader. Seeing the value of different parts, understanding how to make that ensemble work together, being the glue in a sense,” Neta said.

Wendy Smith

Wendy Smith knows how to set goals and check tasks off an overflowing to-do list. Team building, however, was outside her comfort zone. One aim of the Leaders program is preparing faculty to lead large teams.

“If I hadn’t done that, I don’t know that I would have started reaching out and cold-calling people to see if they wanted to be part of something, or tried to lead a project with 45 other people,” said Smith, research professor of mathematics and director of the Center for Science, Mathematics and Computer Education.



Wendy Smith

Smith said the program helped her think strategically about how to build teams and foster strong relationships between team members with different backgrounds and expertise.

“These were skills I hadn’t learned before,” Smith said. “When you get a Ph.D., unless you’re doing it in education leadership or business leadership, you don’t necessarily get those kinds of experiences and opportunities.”

Smith now leads a five-year, \$3 million NSF-funded project to help STEM students smoothly transition from two-year to four-year institutions. This collaboration involves 22 institutions. Read more about the project on page 12.



Nurturing a Culture of Success

Dawn O. Braithwaite capped her 40-year career with some of the university’s and nation’s top honors.

On campus, she received the 2022 James O’Hanlon Academic Leader Award for her exceptional leadership and service. In 2021, she received the National Communication Association’s Distinguished Scholar Award, the group’s highest scholarly accolade. The NCA’s Family Communication Division also named its distinguished book award after Braithwaite, honoring her influential scholarship.

And the Department of Communication Studies, which she chaired from 2011 to 2020 and is now led by Jody Koenig Kellas, has continued its trajectory as an award-winning powerhouse. Since 2011, department faculty have won more than 55 research, teaching and service awards at the national, regional and local levels.

Pandemic notwithstanding, it was a fairy-tale ending for Braithwaite, who retired in May 2022. But none of these recognitions happened by chance. Day in and day out, she followed a leadership philosophy centered on three tenets.

“It’s not magical, any of it,” said Braithwaite, now professor emeritus of interpersonal and family communication. “My focus was on being proactive, fostering relationships, and recognizing and celebrating success.”

It was never about winning awards for awards’ sake. Her original goal was to boost the department’s visibility on campus and nationwide. Considering the department’s small size – it currently has 10 faculty – and the scarce grant funding available in the discipline, awards are an important vehicle for highlighting excellence.

Braithwaite mastered the fundamentals of awards success – and passed these skills to colleagues. She constantly scanned available awards, matching faculty appropriately. She crafted high-quality nomination packages, addressing award criteria and soliciting on-point support letters. She was vigilant about monitoring deadlines.

Most notably, Braithwaite cultivated a culture that celebrates

accomplishments. She initiated traditions that remain today: a departmentwide e-communication with a “congratulations” section; use of social media to honor awardees; an emphasis on personal expressions of congratulations; and encouraging colleagues to seek awards, even if they may not win the first time.

The culture aims to enhance the department’s and Nebraska’s reputation. By creating an environment where people know recognition is valued, they are motivated to keep striving and celebrating success.

“Any time somebody won an award in the department, that brightened the world for all of us.”



Dawn O. Braithwaite



Exploring Ag, Climate Resilience Through Collaboration

A collaborative international “network of networks” aims to explore agricultural and climate resilience and food and water security as never before.

Nebraska ecologists Craig Allen and Tala Awada head a team that received a four-year, \$400,000 grant from the National Science Foundation to establish the Network for Integrated Agricultural Resilience Research.

The network will generate research questions and share data, resources and expertise so affiliated researchers can more comprehensively examine the diversity, complexity and resilience of farming and agriculture in North America at a larger scale than previously possible.

“Most ecological research is done on a square-meter spatial scale and a two- to three-year temporal scale. We want to do research on a much larger scale,” said Allen, professor of natural resources and director of Nebraska’s Center for Resilience in Agricultural Working Landscapes, or CRAWL.

The network includes the U.S. Department of Agriculture’s Agricultural Research Service-funded Long-Term Agroecosystem Research Network; the Canada-based ResNet and the Agriculture Canada Living Labs Initiative; and the international, theory-focused Resilience Alliance. Additional funding from the university allowed Allen and Awada to expand the network to include partners in Mexico, ensuring it spans North America.

Such collaboration is key to pursuing global food security, Allen said. Working together, the networks may be able to identify tipping points at which agricultural systems are vulnerable to unwanted, destabilizing changes – the transformation of a grassland into a forest, for example.

“Often, there’s a trade-off between efficiency and

resilience,” said Allen, the network’s coordinator. “We’re interested in what that tradeoff is, and what those tradeoffs cost.”

Nebraska’s leadership of the new network underscores the university’s long-standing commitment to research on climate resilience and sustainable food and water security, two of the university’s seven Grand Challenge thematic areas. It also highlights the university’s global leadership in agricultural resilience.

“Our diverse landowners and managers are interested in multiple outcomes on their land, and the involved networks will look beyond efficiency and profitability to include sustainability and resilience metrics and indicators across scales,” said Awada, associate dean and director of Nebraska’s Agricultural Research Division and professor of plant ecophysiology.



Above: Craig Allen and Tala Awada

Social Ties May Curb Discrimination Stress

While the link between interpersonal discrimination and chronic health problems is well recognized, researchers still need to understand how discrimination drives health inequities and how to mitigate it.

Nebraska psychologist Arthur “Trey” Andrews offers a fresh perspective. Rather than studying how episodes of discrimination affect people individually – the traditional approach – he’s studying how discrimination-related stress ripples across a social network, impacting its collective health.

But because social networks are also protective against stress, Andrews is working to pinpoint how they can confer health resilience – without causing spillover stress. To find out, he’s studying about 400 Hispanic people.

“We’re really getting at this notion about how discrimination stress, and really stress in general, doesn’t stay within the individual,” said Andrews, associate professor of psychology and ethnic studies and associate director of the university’s Minority Health Disparities Initiative. “We aren’t isolated islands. Those around us help us carry that stress.”

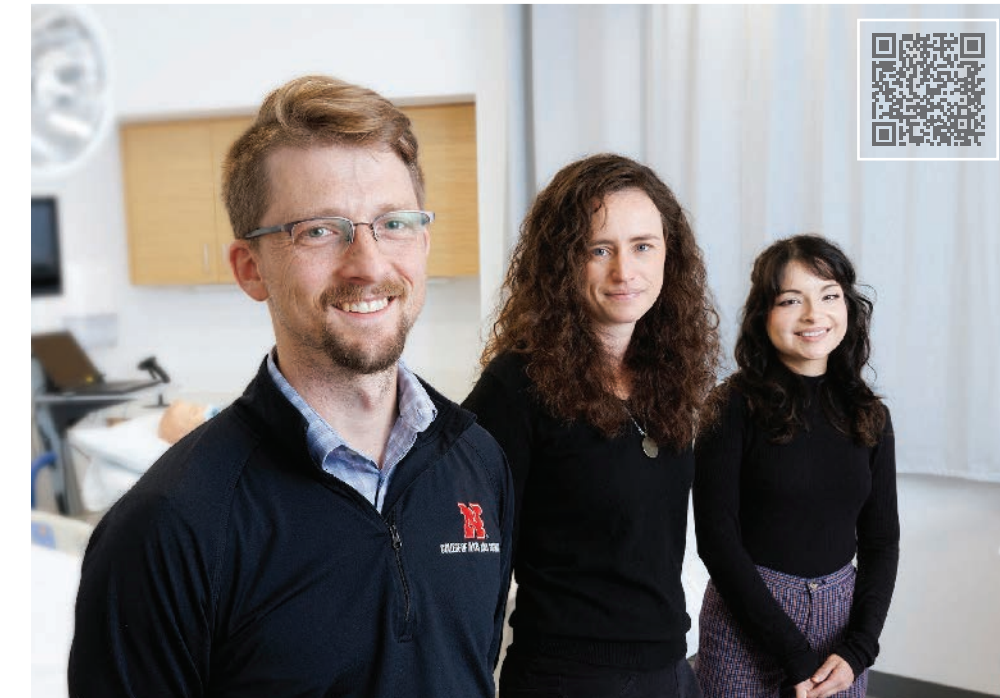
Andrews’ team will determine how discrimination exposure affects a person’s allostatic load, or the bodily wear and tear from stress. Their assessment uses stress reactivity tests and noninvasive physiological biomarkers like cholesterol, an inflammation-related protein, a diabetes indicator and more.

To analyze social network effects, Andrews uses the Open Dynamic Interaction Network. Through this software platform, participants provide information about daily experiences of discrimination and social support. Their responses could be supplemented by ODIN’s use of Bluetooth data, which can anonymously detect when participants are in close proximity.

Using advanced modeling techniques, the team will illuminate how discrimination stress cascades across a network and identify the network

characteristics that reduce stress. This will shed light on how real-life practices and policies – like mentorship initiatives, hiring and retention efforts, and clinical guidelines – can curb discrimination’s health impacts.

A \$2.5 million grant from the National Institutes of Health funds this project.



From left: Trey Andrews, Tierney Lorenz and Sara Reyes are investigating how interpersonal discrimination affects Latinos.





Easing the Transition to Four-year College

Transferring from a community college to a four-year college is often challenging. Students face bigger classes, farther-removed instructors and a larger, more affluent student body.

Nebraska leads a 22-institution research collaboration aimed at smoothing this transition by strengthening partnerships between two- and four-year colleges. The team's research aims to fill a critical gap in the national understanding of what it takes to help transfer students succeed.

The National Science Foundation-funded research hub builds on an existing project at Nebraska funded by NSF's Scholarships in STEM, or S-STEM, program. It provides scholarships and support for academically gifted, low-income STEM students, including some transfer students from local community colleges. The new network brings together similarly focused S-STEM programs at geographically diverse institutions.

The goal is to figure out what's working – and what's not – in these efforts to build institutional partnerships.

"I think that having better and stronger partnerships between two- and four-year colleges is only going to benefit students," said project leader Wendy



From left: Leen Kiat-Soh, Wendy Smith, Mindi Searls and Brittany Duncan

Smith, research professor of mathematics and director of the Center for Science, Mathematics and Computer Education. "It will benefit the students who, in some sense, are starting higher education the most disadvantaged."

Because community college students are more likely to be low income and from historically underrepresented groups, supporting their success would help diversify the U.S. STEM workforce. Though roughly 80% of first-time two-year college students aim for a bachelor's degree or higher, just 29% earn one within six years.

Little national data exist to explain this trend. To fill that gap, researchers are forming topic-based

professional learning communities to discuss issues like student advising, financial aid and instructional approaches. They'll visit S-STEM sites, interviewing leaders to identify best practices. And they'll analyze data from the programs to assess time-to-graduation, graduation rates and more.

A major goal is establishing parity between two- and four-year colleges and eliminating the historical bias in favor of four-year institutions.

"We want to agree on best practices as part of a true partnership, not one with a power imbalance," Smith said.

A \$3 million NSF grant funds this project.



Online Program Boosts Support for Rural Students

Young people are experiencing mental health challenges at unprecedented rates. Rural students often face more isolation and fewer resources than their urban peers, putting them at risk for troubled lives.

In response, the Nebraska Center for Research on Children, Youth, Families and Schools is providing professional development remotely to school-based specialists working with rural students in need.

Susan Sheridan, center director and George Holmes University Professor of School Psychology, and her team have made their successful in-person intervention program, Teachers and Parents as

Partners, available to school specialists online. Instead of Husker teams entering schools to implement TAPP, school personnel access self-paced modules and receive mentoring with online coaches.

As caseloads have skyrocketed, particularly since the pandemic, the online program provides a sustainable, cost-effective professional development strategy that personnel can incorporate seamlessly into their work.

"It's really about scaling it up so that school specialists can learn and utilize this evidence-based program effectively in their own daily work,"

Sheridan said. "They not only want but need support from the parent, and this provides a vehicle to do that."

The center is evaluating the online program's effectiveness, measuring outcomes for

school personnel, parents and students. In its second year, the program includes 30 school-based specialists and 240 students in rural Nebraska and Colorado.

The feedback is encouraging, Sheridan said. What made TAPP successful in person seems to be holding online.

Sheridan pioneered research that bridges families and schools 30 years ago. Since then, she and her Husker team have been researching and building interventions based on positive, strength-based partnerships. The research, emulated nationwide, has proven the family-school connection is highly effective in supporting children's development, particularly those in crisis.

"We can only do so much to benefit children by working within the context of the school day," she said. "If we care about making a positive impact on children, we need to engage all of the adults who are responsible for their learning and development."

A \$3.8 million grant from the Institute of Education Sciences funds this project.



From left: Amanda Witte, Susan Sheridan and Lorey Wheeler.



Preserving Holocaust Survivors' Memories

“It is the ordinary people that we must convince of the necessity – the obligation to remember the Holocaust,” wrote Irving Shapiro of Gering, Nebraska. His family’s lone Holocaust survivor, Shapiro understood the importance of telling his painful story.

To preserve Shapiro’s and other survivors’ memories, UNL developed the website Nebraska Stories of Humanity: Holocaust Survivors and World War II Veterans, a digital collection of historical documentation and memorabilia.

The multidisciplinary digital humanities project records the experiences of Holocaust survivors who made Nebraska home as well as Nebraskans who helped liberate the concentration camps.

As the number of living survivors dwindles, the website is a valuable learning tool for future generations. It features searchable letters, documents, photos, interactive maps and other artifacts.

“The disparate materials highlight the stories of people who were our neighbors. They weren’t just Holocaust survivors. They were people who made lots of contributions as refugees and immigrants in

Nebraska,” said project leader Beth Dotan, a doctoral candidate in the Department of Teaching, Learning and Teacher Education.

Personal narratives draw people into the experience and provide insight into the genocide’s legacy, said project co-leader Ari Kohen, Schlesinger Professor of Social Justice and director of the Norman and Bernice Harris Center for Judaic Studies.

“It’s important to teach not simply the historical event, but the lessons that grew out of the Holocaust: lessons on tolerance, lessons in the opposition to bigotry and xenophobia, lessons about the enduring nature of antisemitism,” Kohen said.

The website includes stories of five survivors and liberators, with additional stories planned. In collaboration with the Center for Digital Research in the Humanities and University Libraries, Dotan and her team enlisted Husker students to help scan, organize and encode nearly 900 items.



Beth Dotan and Ari Kohen

The website launched soon after Nebraska passed legislation requiring schools to teach about the Holocaust and other genocides. To support teachers, Dotan is working with the Nebraska Department of Education to incorporate educational components into the website.

The project has already generated international interest. Dotan anticipates the website will become a model for others and eventually will link to a worldwide network of sites. Numerous community organizations and foundations support the project.

This page: Artifacts collected from Holocaust survivors across the state





Virtual Immune System Could Aid Medicine

Before launching a rocket, scientists use a digital twin for test runs to optimize performance.

For researchers trying to develop new drugs and therapeutics, there's no computer representation of the immune system – even though it's one of the human body's most complex "machines."

Tomas Helikar, Susan J. Rosowski Associate Professor of Biochemistry, wants to change that. He's developing a digital twin of the human immune system to better understand immune-related diseases and speed drug development.

His model could greatly reduce the time and cost of a drug's journey from the lab to the

marketplace, which often takes more than 10 years and roughly \$1.3 billion.

"With a virtual immune system, you can simulate millions of different conditions, which you can do on a computer much cheaper and faster than you can do in the lab," Helikar said.

The immune system's complexity is challenging. It comprises organs, tissues, antibodies, cells, genes and more that influence the behavior of one another. Interactions happen across different scales: in different body parts, at different points in time and at different levels of organization.

The digital twin must connect these different scales, a daunting computational and mathematical task. Helikar demonstrated viability by developing a model focused on a single type of immune cell. He's now working to incorporate more components into the model, which requires fast, efficient and cost-effective algorithms.

Helikar is collaborating with an international group of computational biologists, immunologists, clinicians, mathematicians and computer scientists. In 2022, he

co-authored a paper in *Nature Digital Medicine* outlining a roadmap for success.

The ultimate goal is developing virtual twins of individual immune systems. That would open the door to precision medicine for many conditions including cancer, autoimmune diseases and viral infections like COVID-19.

Helikar's inspiration is his 8-year-old son, who received a lung transplant as an infant. His immunosuppression drugs prevent organ rejection but hamper his immune system's ability to fight other infections. His son's experiences fuel Helikar's research.

"As long as there's a possibility that this can be done, if it can help my son, that's my mission."

A \$1.8 million grant from the National Institutes of Health funds this project.



Tomas Helikar

Improving Support for Sex Trafficking Survivors

Sex trafficking is receiving greater attention globally. As society begins to acknowledge and tackle this silent crime, survivors have a critical, though largely absent voice.

Nebraska's Katie Edwards aims to improve community response by learning from trafficked survivors themselves. She's collaborating with Call to Freedom, a South Dakota-based nonprofit organization that supports survivors, and the University of South Dakota.

This research will improve services, determine barriers to accessing services, help identify victims and address societal problems that contribute to trafficking.

"So much of what's been published has been perspectives of law enforcement or crisis workers. That's really important, but we need to hear from survivors themselves," said Edwards, associate professor of educational psychology in the Nebraska Center for Research on Children, Youth, Families and Schools and director of Nebraska's Interpersonal Violence Research Laboratory.

Edwards' team worked with Call to Freedom and its advisory boards of professionals and survivors to

refine every aspect of the project. The team is conducting surveys and interviewing clients as well as prison inmates who were trafficked. Nearly half of Call to Freedom's clients are Native American women.

Executive director Becky Rasmussen said working with Nebraska will improve services and support efforts to distribute best practices nationally, aiding similar organizations and enhancing public policies and awareness.

"Vulnerabilities come through gaps in legislation, housing and services," Rasmussen said. The project "takes a holistic approach to addressing vulnerabilities so survivors aren't pulled back into trafficking situations."

Sex trafficking is highly underreported and its prevalence unknown. By better understanding the circumstances of trafficking, this research will help law enforcement, schools and others recognize victims and intervene.

Because so little research has focused on survivors' experiences, Edwards anticipates national interest in the results. The team has presented information to the FBI and the Centers for Disease Control and Prevention.

"We make a really good team," Edwards said of the collaboration. "At the end of the day, we all want to support survivors in their journey toward healing and recovery."

The U.S. Department of Justice-National Institute of Justice funds this research.



Katie Edwards



Educating Beekeepers, Protecting Pollinators

Keeping honeybees isn't just a hobby. The pollinators play vital roles in food production and the environment. But climate change and pesticides are weakening hives and reducing honey production.

To help reverse these trends, Nebraska runs Great Plains Master Beekeeping, a program providing educational materials and hands-on training to the region's beekeepers.

"There's an overabundance of online resources, but it's actually causing problems for our area. What works in Texas isn't going to work here," said Judy Wu-Smart, associate professor of entomology and director of the UNL Bee Lab. "The idea is to provide beekeeping training that makes sense for the Midwest region."

For example, the program counters the popular message of letting weak hives die out. With the region's high concentrations of beekeepers, that's a recipe for mites and other diseases to spread.

The program partners with beekeeping associations to create open apiaries, places where all levels of beekeepers receive hands-on training, a critical component that's largely been lacking regionally.

Educational materials cover everything from managing hive health to liability and marketing.

The program trains and funds local beekeepers to run the educational component and maintain the apiaries. Husker undergraduate and graduate students conduct much of the training, providing valuable services while honing their extension and science communication skills.

Wildly popular, the program has grown more than 600% since it started in 2019. More than 1,600 beekeepers in six states have participated.

Keeping bees healthy also means caring for the environment. The program incorporates land stewardship training, including conservation practices and pollinator-friendly landscaping.

Beekeepers become advocates for the environment. They talk with farmers about integrated pest management and conserving natural resources to benefit bees and the crops they pollinate.

"It brings more awareness to the role beekeepers play in our agroecosystems," Wu-Smart said. "A lot of people don't realize that honeybees provide critical pollination services to numerous food

systems. If we lose our beekeepers, it's going to be harder for us to be successful in our farming as well."

The U.S. Department of Agriculture's National Institute of Food and Agriculture funds the program.



Judy Wu-Smart



Looking Back for Future Climate Clues

The world is entering uncharted territory with climate change. Scientists and policymakers are scrambling to pinpoint what's happening, where we're headed and how to respond.

Nebraska paleontologist Ross Secord is among them. With a nearly \$350,000 grant from the National Science Foundation, he's pursuing a first-of-its-kind study that explores how climate change affected the environment, ecosystems and organisms during the Early Eocene Climatic Optimum. The EECO took place about 52 million years ago and was the warmest interval of the past 70 million years.

Marked by a shift to high carbon dioxide levels, warm temperatures and increased precipitation, the transition from pre-EECO to the EECO is considered a good analogue for future climate change. Better understanding ecological changes during this time may provide clues to scientists trying to forecast future conditions.

"Studying intervals in the geologic record where the global warming experiment has already occurred gives you a way of figuring out what the possible outcomes of climate change may be," said Secord, associate professor of earth and atmospheric sciences.

Secord and collaborators are analyzing fossil records from Wyoming's Bighorn and Wind

River basins, which have rich collections from the EECO. They will identify the types of forest structure that prevailed during that period. Their findings will clarify the interrelationship between climate change, forest structure and mammal evolution.

Secord will analyze fossil teeth of EECO mammals to infer the types of habitats present in the environment. Mammalian tooth enamel preserves the different types of carbon found in the plants they consumed. This process is part of stable isotope geochemistry, one of Secord's specialties.

Nebraska's Judy Diamond is leading an outreach plan that provides 50 rural and tribal libraries in Nebraska and across the nation with current information about climate change, water resources, mammal evolution and more.

Diamond and advisers developed a list of publications spanning all ages from which partnering libraries can select materials. Showcasing the work of Indigenous authors is a priority.

"This grant provides an opportunity for these libraries to acquire the very best and latest books on these subjects," said Diamond, University Libraries and Museum professor.



Judy Diamond and Ross Secord



Visiting Prehistoric Nebraska Virtually

With a new 3D, interactive virtual museum, history lovers worldwide can now experience prehistoric Nebraska.

"Expedition Nebraska: A Natural History VR Experience" is a virtual extension of the University of Nebraska State Museum. Using a computer, smartphone or virtual reality headset, viewers from anywhere can see exhibits and fossils from different perspectives and "meet" Great Plains animals from millions of years ago.

The project is a partnership between the museum and Nebraska Public Media Labs, one of the first collaborations between a museum and a public media outlet. The goal is making the museum's rich collections globally accessible and creating a repository of educational resources.

The team developed the virtual museum using photogrammetry, which stitches together many pictures of an object using specialized software.



The interactive virtual museum uses photogrammetry to give viewers a fully immersive, nearly 360-degree perspective of exhibits.

This allows viewers nearly 360-degree access to observe exhibits. Developers used 3D modeling, advanced audio techniques and a game engine to complete the environments.

Visitors can move through exhibits discussing Nebraska's Sandhills and simulating the museum's original location from 1871. The "Cave of Time" houses portals to seven prehistoric ages. Users can enter these fully immersive "bioramas," encountering photogrammetrically rendered animal models in their environments.

The team will develop additional content for this experience over the next decade.

Imaging Tool Rapidly Assesses Seed Quality

Improving agriculture in a world that's heating up and drying out isn't solely about increasing yields. Nutritional quality is also crucial.

While measuring yield is as easy as weighing grain, what's inside seeds is harder to discern.

To help improve the nutritional value of crops undergoing heat stress, Nebraska agronomist Harkamal Walia teamed with computer scientist Hongfeng Yu and his team.

Together, they developed HyperSeed, an imaging system that uses light wavelengths to rapidly create a nutritional fingerprint of each seed.

"We had a bunch of seed for which we had measured yield, but it wasn't feasible to ascertain the quality of those grains," said Walia, Heuermann Chair of Agronomy. "The cool thing was they came up with an engineering solution."

The hyperspectral camera beams infrared electromagnetic waves onto seeds to measure reflection and absorption patterns. The results identify an individual seed's nutritional characteristics such as moisture content, nitrogen levels and starch content.

Normally, testing multiple varieties would require months of growing large numbers of plants to assay

seeds that are destroyed in the process. With just a handful of seeds, HyperSeed cuts the procedure down to seconds. Intact seeds can then be planted or further investigated.

Scientists can link variations in seed traits found by HyperSeed with changes in gene sequences. The technique can also be used to study the effect specific genes have on grain quality in gene-edited crop lines.

Yu, associate professor in the School of Computing and director of Nebraska's Holland Computing Center, and his team developed open-source software using affordable hardware, allowing others to customize the system for their research.

HyperSeed's approach is similar to the hyperspectral camera at the Greenhouse Innovation Center on Nebraska Innovation Campus that measures plant traits. HyperSeed, however, is able to focus at the level of seeds and other tiny objects with high resolution.

"Hopefully, this will help make agriculture and food more resilient to a changing climate and increasing populations," Walia said.

The team detailed its system in the journal *Sensors*. The National Science Foundation funds this research.

From left: Graduate student Tian Gao, Harkamal Walia and Hongfeng Yu





Tenant Assistance Project Fights Evictions

Even before the pandemic, Nebraska legal scholar Ryan Sullivan knew the system was broken.

When eviction hearings continued despite calls to isolate at home, he drove to the courthouse to see what he could do. Sullivan saved seven struggling families from immediate eviction that day. Then he kept showing up.

“Evictions are always bad for society,” he said. “But it’s even worse when they exacerbate a pandemic.”

Sullivan’s one-man operation quickly evolved into the Tenant Assistance Project, a successful low-cost legal program recognized by the White House as a national model.

Launched in April 2020, TAP provides free legal representation to low-income families facing eviction in Nebraska’s two most populous counties. Sullivan received the Association of American Law Schools Access to Justice Award for founding TAP and for his other public interest work.

favor landlords because they have lawyers, he explained. He was developing a program to send students to court several times a year to shake things up when the pandemic accelerated and expanded his vision.

With a 98% success rate, TAP has helped more than 2,000 families avoid immediate eviction. As landlords adjust to the new reality, fewer families end up in eviction court.

The White House featured TAP in a push to curb evictions during the pandemic. The volunteer-run program costs a fraction of other states’ programs. More than half of the volunteers are Husker law students. The Nebraska Bar Association’s Volunteer Lawyers Project now facilitates the program.

Sullivan supervises law students in court, who gain valuable experience and an intimate view of poverty. He’ll soon share those duties with two full-time fellows in the College of Law’s new Housing Justice Clinic, established as a result of TAP’s success.

“I’m excited for these energized and capable fellows to take this grassroots project and make it something special,” said Sullivan, clinical associate professor of law.

He’s been researching Nebraska housing law and evictions for years.

“In Nebraska, we have a system that incentivizes eviction over working things out,” Sullivan said. “Eviction court has become factory-like, churning out hundreds of evictions each week across Nebraska.”

Even when the law is on the tenant’s side, outcomes historically



Ryan Sullivan

Designing Effective Health Messaging

As the pandemic settled in, Ciera Kirkpatrick was a new mom working on her doctorate, a double challenge added to the already tall order of first-time motherhood.

Kirkpatrick reflected her experience in her dissertation, studying how social media depictions of motherhood can affect how women perceive their own experience. It informs her broader interest in how media messages influence people’s health-related decisions.

Kirkpatrick’s research exposed 464 new mothers to 20 Instagram posts from the accounts of “mommy influencers” and “everyday mothers.” Half idealized motherhood – clean house, mom in makeup, happy kids – and half presented more authentic depictions.

Exposure to the idealized portrayals, whether from actual influencers or regular moms, increased envy and anxiety in the group, said Kirkpatrick, an assistant professor of advertising and public relations.

She could relate.

“I have personally noticed many instances in which I have compared myself to portrayals of motherhood on social media and have had negative effects from it,” she said. She even found herself



Ciera Kirkpatrick and her son, Dysen, in a photographic depiction of how motherhood is portrayed in the media.

posting idealized depictions of her own life. She also tries to keep it real with other posts “to showcase the difficulties and challenges too because ... I know showing the hardships can help make other moms feel less alone in what they are experiencing and feeling.”

Kirkpatrick studies how media messaging affects individuals’ mental and physical health, and how strategic communicators can design messages to improve health outcomes by promoting healthy behaviors and discouraging unhealthy behaviors. The pandemic has offered a unique opportunity for this research as people react to messages about everything from masking to vaccinations from social media, friends, family and medical experts.

In some cases, she found, peers can deliver a message more effectively than experts. Her research aimed at increasing enrollment of minority populations in clinical trials found that people were more receptive to hearing from other people of color who had participated in trials than from doctors.

Designing health messaging strategically – depending on the specific audience and goal of the messaging – is key to helping people navigate myriad decisions, Kirkpatrick said.

Kirkpatrick won the university’s 2021 Faculty Research and Creative Activity Slam with her talk, “Mass Media’s Effects on Health and How Strategic Communication Can Aid in Achieving Health Equity.”





Inspiring Innovation with Arts, Emerging Media

Nobody knows how media technology will evolve in the coming years. But helping educators and others understand, embrace and teach innovation is key to future generations' success in using it.

A Husker team is doing just that with a five-year pilot project to promote teaching innovation through arts and emerging media in Nebraska public schools. Guy Trainin, professor in teaching, learning and teacher education, leads the interdisciplinary team that is collaborating with K-12 educators, artists and administrators.

Recent media advancements range from virtual reality and social media apps to video creation technology and wearable media, so the team has its work cut out for it.

The Teaching with Arts and Emerging Media (Art TEAMS) project is funded by a \$1.9 million grant from the U.S. Department of Education and is a

collaboration between Trainin's team and the Johnny Carson Center for Emerging Media Arts in the Hixson-Lied College of Fine and Performing Arts. The project is based in the Nebraska Center for Research on Children, Youth, Families and Schools.

Art TEAMS will establish a professional development curriculum for 40 Nebraska teachers to integrate arts and emerging media into their curricula. Researchers aim to foster inclusive, arts-based classroom approaches that embrace students' cultures and voices.

The team recruited the first cohort of 20 teachers in summer 2022, starting with an intensive, two-week curriculum on campus. Participants from different disciplines are paired to "develop ways to integrate the arts across all content areas," Trainin said.

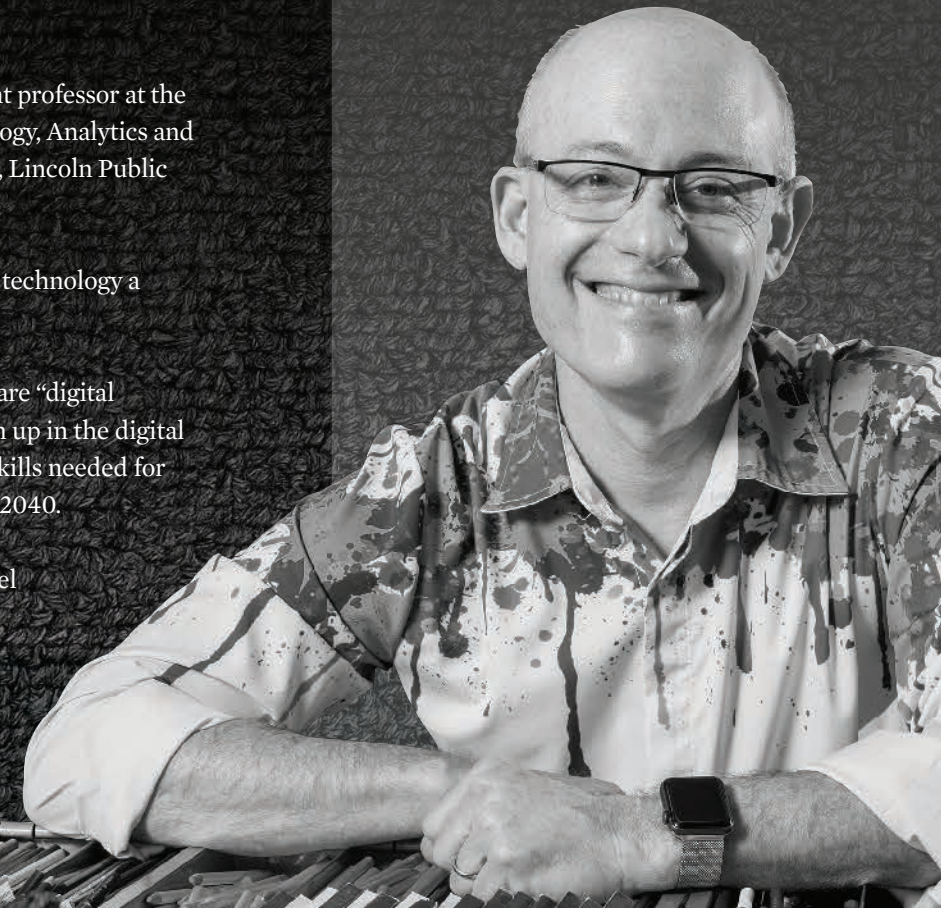
Other project researchers include Kimberly D'Adamo, TLTE lecturer and artist;

HyeonJin Yoon, research assistant professor at the Nebraska Academy for Methodology, Analytics and Psychometrics; and Lorinda Rice, Lincoln Public Schools art curriculum specialist.

Trainin calls the rapidly evolving technology a "fourth industrial revolution."

One goal is to help teachers who are "digital natives" — those who have grown up in the digital information age — envision the skills needed for students graduating in 2030 and 2040.

As the professional learning model matures, the goal is to share it with more teachers across Nebraska and the U.S.



Guy Trainin

Core Facility Focuses on Media Arts

Media arts and technologies are key components in education, and Nebraska will continue to be a major contributor to those efforts, thanks to an infusion of funding.

The Johnny Carson Center for Emerging Media Arts received \$625,000 from the university's Nebraska Research Initiative to establish itself as a core research facility at Nebraska.

The facility — the Johnny Carson Center for Emerging Media Arts-Design and Innovation Core — will leverage emerging media arts and technologies to strengthen the quality of a Nebraska education, cultivate interdisciplinary research communities of practice, engage with Nebraska's startup communities and enhance an international network of distributed innovation outside of traditional metro hubs.

It is the only research core facility in the Hixson-Lied College of Fine and Performing Arts and the only arts-based research core facility across Nebraska.

"The Johnny Carson Center for Emerging Media Arts is thrilled to create this Design and Innovation Core," said Megan Elliott, founding director of

the Carson Center. "Our faculty are already engaged in national and international research, and this core research facility will only strengthen our research and innovation."

A research core facility offers the university community and external clients shared access to specialized instrumentation, research expertise and services in an organized, cost-effective manner.

One example of the core's research service capabilities is a project by Jesse Fleming, assistant professor of emerging media arts and founding director of the Awareness-Based Design Lab, who is collaborating with external artists. The Carson Center is providing technical expertise in augmented and mixed reality, virtual production and real-time filmmaking for a project that culminated in a live mixed-reality performance season of "The Wilds" at the Lied Center for Performing Arts in fall 2022.

NRI funding is designed to facilitate and grow faculty research programs that have an impact in Nebraska and worldwide.

Avoiding School Violence Before It Starts

As the nation tackles rising school violence, Nebraska is investigating ways to head off threats.

The University of Nebraska Public Policy Center is evaluating tip lines Nebraska schools set up for students, parents, staff and the community to report behaviors of concern. Many lines also support students in crisis, such as those being bullied or feeling suicidal.

“We’re trying to get people to come forward when there’s a problem so we can address it quickly,” said center director Mario Scalora, professor of psychology. “We find that if we give people assistance, they’re less likely to hurt themselves or other people.”

Scalora and his team are evaluating a range of issues, from factors that influence people to come forward to the type of concerns reported and how they’re handled. Scalora is a nationally known expert in threat assessment and violence prevention.

Traditionally telephonic, tip lines today include apps, websites, texts and emails.

Although many school districts have established their own threat assessment process, the state



Mario Scalora and Denise Bulling

also recently provided an option called Safe2HelpNE, a statewide tip line program school districts can opt into.

The program differs from most states’ systems in two important ways, said Denise Bulling, the center’s senior research director. First, calls are answered by trained crisis counselors rather than law enforcement.

“The goal is not necessarily to bring law enforcement in unless it’s a crime,” Bulling said. “The goal is to wrap support around the person in crisis and divert them from that path to violence.”

Second, to receive a report from Safe2HelpNE, a school must have a trained threat assessment team in place, ready to act.

The center partners with the Nebraska Department of Education to conduct threat assessment trainings open to all Nebraska public and non-public school systems. Results from the center’s study will help refine trainings and improve community resources.

The center is also evaluating the new federal 988 mental health hotline and examining how it’s working in conjunction with local and state tip lines. Its findings will help guide local and national threat reporting and prevention.

A \$1.28 million U.S. Department of Justice grant funds this project.



Limiting Landfill Greenhouse Gas Emissions

Landfills are never going to be anyone’s favorite landscape feature. But there may be a way to move them down the “not in my backyard” list.

Nebraska researchers are studying how to remediate gas emissions from landfills with an innovative ground-covering system.

Jongwan Eun, associate professor of civil and environmental engineering, and Yunwoo Nam, associate professor of community and regional planning, began their work four years ago with a grant from the Nebraska Environmental Trust. They’re using a cover made from an extruded geomembrane with an ethylene vinyl-alcohol layer sandwiched between two inner, low-density polyethylene layers. The team is comparing this system in field tests to traditional covering systems made of low-density polyethylene and no covering.

This is the first time this approach has been tested.

Preliminary research results are promising: The new system, tested at a 3-acre landfill in Butler County, Nebraska, reduced gas emissions by 30 to 40% over conventional covers. Landfill gas emissions are the third largest source of greenhouse gases in the United States.

Jongwan Eun and Yunwoo Nam hold the extruded geomembrane.

They include hazardous, noxious gases that often worry landfill neighbors.

Researchers also are gathering and analyzing data about the new system’s potential impact on any given community using gas dispersion modeling. Knowing how far the gas travels with this new covering system is important for landfill planning.

The team also analyzed the new technology’s cost effectiveness.

“Although initially more expensive to install than the traditional approach, based on our simulation for the sixth and seventh year, there is a turning point where you will see a return on investment,” Nam said.

With less gas emissions, higher gas collection and greater return on investment, the method may soon be adopted by communities looking to upgrade their systems.

“I wanted to provide information that others can use for a good alternative to control and manage the greenhouse gases from landfills, which will be a huge benefit for the environment,” Eun said.



ECONOMIC DEVELOPMENT

Startup Helps Farmers Fertilize Smarter

Nitrogen fertilizer is a key tool in crop production. But producers walk a tightrope to apply it efficiently.

They need enough to boost yield, but fertilizer is expensive and overuse can harm the environment. Determining how much nitrate is available to crops is challenging, making precise application a struggle.

To help farmers navigate this dilemma, Husker graduate student Jackson Stansell launched Sentinel Fertigation. The Nebraska Innovation Campus-based company offers a real-time, imagery-based software and management framework that empowers farmers to make data-backed decisions about if and when to apply nitrogen.

“Farmers don’t want to apply nitrogen unnecessarily, especially when prices are as high as they are right now,” said Stansell, a biological systems engineering student and company CEO. “What they’ve really liked about our solution is the ability to have data that backs that decision and gives them confidence.”

The company’s N-Time Fertigation Management System, or N-Time FMS, is a web application that quantifies crops’ nitrogen status. It recommends how much fertilizer farmers need to apply through their irrigation systems throughout the

growing season. Aerial imagery is the backbone of the software. Based on near-daily satellite information, N-Time FMS gauges crop conditions and predicts optimal timing for nitrogen application.

The platform’s focus on timing is unique. Other products recommend ideal rates of nitrogen to

apply across a field, but that requires farmers to use variable rate technology, which is expensive and requires expertise.

“We’re trying to meet farmers where they are and allow them to improve nitrogen use efficiency through the timing aspect, which they have control over,” Stansell said.

Stansell capitalized on university resources to form his company. NUtech Ventures, the university’s commercialization affiliate, applied for patent protection for the technology and subsequently licensed it to Sentinel Fertigation. Stansell also participated in NUtech’s Nebraska Introduction to Customer Discovery program, which connected him to the local entrepreneurship community.

He also participated in The Combine Incubator, a NIC-based initiative providing innovators with business know-how and networking support.

In February 2022, Sentinel Fertigation was the first recipient of a \$25,000 investment from the Husker Venture Fund, a student-led initiative supporting Nebraska-owned early-stage startups. In May 2022, the company announced an initial \$1.2 million round of seed funding.



Joe Petsick, faculty adviser for the Husker Venture Fund, stands with Jackson Stansell, founder and CEO of Sentinel Fertigation.



Jackson Stansell reviews field data with Brett Gerdes, a senior Husker agronomy student who interns at Sentinel Fertigation.



ECONOMIC DEVELOPMENT

Hotel Opens on Innovation Campus

The Scarlet Hotel's opening marked another step forward in Nebraska Innovation Campus' mission to foster public-private research collaborations at the innovation hub, now home to nearly 60 partners.

The 154-room Marriott Tribute hotel opened in May 2022 and is attracting companies, researchers and community members to NIC.

"The hotel makes NIC an even more attractive site for research and collaboration," said Dan Duncan, NIC executive director. "People visiting The Scarlet see firsthand NIC's world-class facilities and growth opportunities, which paves the way for building new partnerships to enhance Nebraska's economy."

The hotel, adjacent to the NIC Conference Center, features a coffee shop, signature restaurant and

rooftop bar. These venues feature Nebraska-inspired fare, like ice cream from the university's Dairy Store and coffee developed in partnership with The Mill Coffee & Tea. Each room has a distinct, Nebraska-oriented theme, such as a suite named for former Husker football coach Tom Osborne.

The hotel is also a learning laboratory for Nebraska's hospitality, restaurant and tourism management students. The university received a \$1.6 million grant from the U.S. Department of Commerce to help build a 100-seat classroom and offices in the hotel. Students will gain hands-on experience in many aspects of the hotel's operation.



Clockwise, from left: The Scarlet Hotel lobby; an opening celebration; and architectural renderings of a teaching kitchen and classroom.



Celebrating University, Industry Partner Innovators

NUtech Ventures, the university's technology commercialization affiliate, annually recognizes outstanding university personnel and industry partners who develop and commercialize cutting-edge research. Seven earned 2021 Innovator Awards.

A goal of Nebraska's N2025 strategic plan is increasing the number of patents, copyrights, licenses and research-based startup companies. "These awards reflect our university's commitment to advancing innovation and making it available for broader impact, both here in Nebraska and around the world," Chancellor Ronnie Green said.

Ron Faller, Willa Cather Research Professor and director of the Midwest Roadside Safety Facility, received the Prem S. Paul Innovator of the Year honor. Faller and his team have longstanding collaborations with public transportation officials and companies to design and test new technologies in highway safety. The honor is given to an individual who exemplifies innovation and entrepreneurship by advancing novel research into significant commercial use.

The **Midwest Roadside Safety Facility** and **Traffic Devices Inc.** jointly received Breakthrough Innovation of the Year accolades for development of the Delta crash

cushion, a guardrail safety device that evenly distributes energy to slowly bring a vehicle to a stop and reduce a crash's impact. Delta is approved for commercial use. The award recognizes an emerging technology with potential to profoundly impact an industry, business or field of study.

Eric Markvicka, assistant professor of mechanical and materials engineering, is the Emerging Innovator of the Year for his robotics research. Through combining knowledge in computer and materials science, Markvicka studies how materials interact with the human body and the surrounding environment. His work has applications for wearable medical devices, biosensors, soft robotics and multifunctional materials. The honor recognizes a researcher, often a junior faculty member, for recent innovative contributions.

Megan Hopkins, project director of the Nebraska Collegiate Prevention Alliance, earned Creative Work of the Year honors for co-developing an online program to address substance abuse issues among college students. It is used at colleges and universities across Nebraska and Missouri. Data show participating students receive fewer alcohol sanctions and are more likely to remain enrolled by junior year. The award recognizes an individual who has developed a creative innovation, typically protected under copyright.

TurfGrade, a company launched by agronomist Bill Kreuser during his time as a Nebraska faculty member, is the Startup Company of the Year. The research-based GreenKeeper app provides guidance for applying fertilizer and plant growth regulators, making turfgrass management simpler and more sustainable. Customers include high-end golf, baseball and softball facilities. The award recognizes a startup company founded by Nebraska faculty, staff or students that has made significant progress in becoming a sustainable business.

Jackson Stansell, graduate student in biological systems engineering, is the Outstanding Graduate Student of the Year. He co-developed a fertigation management system to help farmers decide when and how much nitrogen fertilizer to apply. The N-Time Fertigation Management System is the basis of his startup company, Sentinel Fertigation. Read more on page 30. Stansell worked with NUtech to patent protect and license the system. The award is given to a student who has developed an innovation and is progressing toward commercialization.

Above: Brad Roth, president and executive director of NUtech Ventures (left), addresses the crowd at the 2021 Innovator Awards celebration.

Construction, Renovations Bolster Research, Learning

Major capital investments are enhancing student learning, expanding research capacity and better positioning the university for the future. Construction projects are in progress or recently completed to improve facilities in animal agriculture, architecture, education and human sciences, engineering, law and speech-language pathology.

Feedlot Innovation Center

A Feedlot Innovation Center will provide new capacity for the university to develop and evaluate technology used to manage animals in feedlot settings.

The \$5 million facility at the Eastern Nebraska Research, Extension and Education Center near Mead, Nebraska, will include state-of-the-art, commercial-scale feedlot and animal handling. It will bolster teaching, research and extension efforts in the Institute of Agriculture and Natural Resources. Completion is expected in 2023.



IANR has committed \$2 million to the project, with the University of Nebraska Foundation leading a \$3 million private fundraising effort. The center addresses one of the university’s seven Grand Challenges – ensuring sustainable food and water security for a growing world in a way that promotes resilience of natural resources and a high quality of life for people engaged in agriculture.



Rendering of the Engineering Research Center

College of Engineering

A \$190 million multiphase project for the College of Engineering is the largest academic facilities project in university history.

The new 87,000-square-foot Engineering Research Center, which opened in spring 2022, houses more than 50 research labs emphasizing materials, biomedical topics and light-matter interactions. Work on Phase 1, totaling more than \$75 million, also includes renovating 68,000 square feet in

Rendering of the Feedlot Innovation Center

Walter Scott Engineering Center, creating additional research and teaching labs, department offices and classrooms. Renovation began on the third floor and will continue down to the basement, with an early 2024 completion date.

Also underway is the \$115 million Kiewit Hall, dedicated to undergraduate engineering education. Classes are expected to be held in Kiewit Hall beginning in spring 2024, although the building may not be fully completed. The building is entirely funded by private and corporate donors including a \$25 million naming gift from Peter Kiewit & Sons.

The 182,000-plus-square-foot building will feature instructional classrooms and labs as well as numerous student design and collaboration spaces. It will also house the college administrative offices, Engineering Student Services and Lincoln-based construction



From right: Lance C. Pérez, Chancellor Ronnie Green and others sign the beam during the Kiewit Hall topping out ceremony.

management programs. A large outdoor plaza will be available to the university community.

College of Architecture

When completed, the first renovation and expansion project at the College of Architecture in 35 years will create a contemporary learning environment, add considerable space and consolidate learning areas and offices now housed in several buildings.



Rendering of a new student commons area

The project’s first phase will add 12 design studios, a wellness room, spray booth and work areas, critique spaces, accessible restrooms and a 2,490-square-foot library with student common and collaboration areas by spring 2023. Renovations will be done in both Architecture Hall East and Architecture Hall West, two of the oldest buildings on campus. Later phases

are expected to add more studios and renovate other areas in the west building.

With 17% enrollment growth in the past decade, the college has had to rent or use space in several buildings and transform nontraditional learning spaces into design studios.

College of Education and Human Sciences

The College of Education and Human Sciences is honoring the legacies of two longtime faculty members by naming buildings for them.

The college’s newly constructed City Campus headquarters is Carolyn Pope Edwards Hall. Its East Campus Human Sciences Building has been renamed Gwendolyn A. Newkirk Human Sciences Building.

Edwards was a Nebraska faculty member for 18 years in psychology and child, youth and family studies. A renowned expert in how children learn, her life’s mission was raising the quality of young children’s education by understanding how they develop and thrive cognitively, socially and morally. She died in 2018.

Newkirk, considered a trailblazer in home economics, came to Nebraska in 1971 as chair of the



Carolyn Pope Edwards Hall during construction

Department of Home Economics Education and was a longtime leader in the college and university. It’s believed she was the first faculty member of color in the college and was its only department chair of color. She retired in 1991.

Opened in summer 2022, Carolyn Pope Edwards Hall is a 126,590-square-foot, four-story building that provides transformational learning space. It features classrooms, meeting spaces, offices, labs, a 400-seat auditorium and a link directly to Teachers College Hall. The approximately \$38 million facility is home to the CEHS Dean’s Office; the Department of Child, Youth and Family Studies; the Department of Teaching, Learning and Teacher Education; and the Nebraska Center for Research on Children, Youth, Families and Schools.

The Gwendolyn A. Newkirk Human Sciences Building houses a portion of the Department of Nutrition and Health Sciences and the Department of Textiles, Merchandising and Fashion Design, classrooms, the Robert Hillestad Textiles Gallery and the Osher Lifelong Learning Institute.





Construction, Renovations Bolster Research, Learning

Holland Computing Center

The legacy of David Swanson continues to support student and faculty research through Nebraska's

Holland Computing Center.

In May 2022, the center launched Swan, a new supercomputer that provides

cutting-edge resources at no cost to researchers, instructors and students across the university system. The supercomputer is named for Swanson, the center's founding director, who was killed in a car accident in 2019.

Barkley Memorial Center

A \$10 million project will improve the Barkley Memorial Center as a state-of-the-art training and research facility for students in the College of Education and Human Sciences' speech-language pathology and audiology programs.

The new Barkley Speech Language and Hearing Clinic space will feature three large, three medium and 13 small treatment and diagnostic clinical rooms. Specialized treatment rooms will be available for gross motor skills, smart room diagnostics, life skills, motor speech and augmentative and alternative communication. Clinical and specialized treatment rooms are equipped with Video-Audio Learning Tool software to improve training.

At the Barkley Memorial Center, several new research laboratories will support cutting-edge studies in swallowing and voice physiology; neuroimaging and data analytics of reading and sensory systems; human brain-computer interface and augmentative communication technology; neurobiology of neonatal feeding; and sensory-based neurotherapeutics.

The new speech-language clinics and audiology expansion were completed in summer 2022, with the remaining Barkley Center renovations to be finished in early 2023.

Schmid Law Library

The Law College's \$6 million renovation of 38,000 square feet of Schmid Law Library aims to change its emphasis from housing collections to supporting service to its community and modernizing student-centered spaces.



Schmid Law Library

More collaborative open study spaces, private study rooms, technology suites, two new classrooms and centrally located library offices are among the changes. The relocated Archives Collection is more accessible, and a lower-level informal space supports casual presentations and connects the library with the rest of McCollum Hall. A wellness space with outdoor garden access supports student wellness programs and new entrances improve access. Work was completed in fall 2022.

The renovated library includes two unusual elements. A Nadine McHenry painting of the Sandhills titled "Getting There from Here" was repurposed as a wall covering, and a hydroponic biowall features a variety of plants.



Rendering of the Barkley Memorial Center

Seven Earn NSF Early Career Awards

Nebraska researchers are answering longstanding questions about turbulence, unlocking the potential of RNA, analyzing Title IX implementation, developing a nanosized disease detector and more with Faculty Early Career Development Program awards from the National Science Foundation. In 2022, seven Nebraska faculty received the prestigious five-year grants supporting outstanding pre-tenure faculty, totaling nearly \$4.3 million.

Background photo: In Ruiguo Yang's microscope apparatus that mimics a cell-cell junction's physiology, trapezoidal platforms are pulled apart to stress the junction in between two mature cells.

Better Understanding RNA



Joseph Yesselman

He's using a \$1.2 million CAREER award to develop a computational model to reliably predict RNA's capacity to form tertiary contacts: connections that enable RNA to fold into the complex 3D structures that dictate their biological relevance.

Tertiary connections form only under two conditions. An RNA strand must have specific types of structural components, called motifs, and it must be flexible enough to bend and unite these motifs.

The model will predict which RNAs check both boxes, helping scientists understand the fundamental RNAs inside cells and guiding development of new, stable RNAs for biotechnology, research and medicine. It will shed light on how to quell RNA viruses like influenza, COVID-19 and Zika.

To engage the public, Yesselman, assistant professor of chemistry, is launching RNA design challenges through an online video game platform. He's also developing a course for Husker students using video games to introduce molecular design concepts.

"You can make things fun, and people can learn at the same time. I think this whole movement of gamifying knowledge is really powerful."

Boosting Crops' Cold Tolerance



Katarzyna Glowacka

Katarzyna Glowacka is using a nearly \$1.4 million CAREER grant to investigate a mechanism that could enhance the cold tolerance of corn, sorghum and sugarcane.

These crops use the same type of photosynthesis as their close cousin, miscanthus, a large perennial grass. Unlike the others, miscanthus survives and thrives at low temperatures.

If corn, sorghum and sugarcane were similarly fortified against cold, they could be planted earlier in the spring, enabling them to mature before summer droughts and survive in a broader range of climates.

Glowacka, assistant professor of biochemistry, thinks miscanthus' cold resistance stems from its unique regulation of non-photochemical quenching. This process enables plants to convert excess solar energy into heat instead of letting it cause damage. Glowacka's preliminary data show that in miscanthus, this process also protects against chilling.

Using a blend of high-throughput phenotyping, genetics approaches and redox metabolomics, Glowacka aims to develop a clearer picture of events that trigger this bolstered defense system. As weather extremes and water scarcity intensify, cold-tolerant crops are increasingly important.

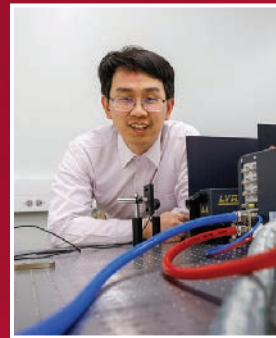
"The goal is to understand the protective mechanism and develop some guidance toward developing more chilling-tolerant corn, sugarcane and sorghum."



HIGHLIGHTS

Early Career Accolades

Expanding Access to Quantum Simulators



Wei Bao

Right now, quantum simulators – devices that shed light on quantum states of matter – require bulky ultra-low-temperature vacuum systems inaccessible to many research labs.

Husker engineer Wei Bao wants to change that. With a nearly \$760,000 CAREER grant, he's developing simulators that work at room temperature, which would make them far more accessible to researchers.

"This will lower the bar for a lot of researchers to access these quantum simulations," said Bao, assistant professor of electrical and computer engineering.

To accomplish this, Bao will synthesize novel optical materials and integrate them with photonic structures. Using these room-temperature quantum simulators, he will study the rich, exotic materials properties that previously have been difficult to understand.

The first quantum revolution produced the technology that defines modern life: computers, lasers, telecommunications and more. Bao's work will advance the second quantum revolution, which is expected to unlock new possibilities in sensors, communication networks and computers.

Quantum simulators are key tools in powering the next wave of discoveries based on quantum mechanics, a fundamental physics theory describing nature's physical properties at the atomic and subatomic levels.

Right now, quantum simulators – devices that shed light on quantum systems or create quantum

Understanding Cell-cell Junctions



Ruiguo Yang

Ruiguo Yang, associate professor of mechanical and materials engineering, is using a \$540,000 CAREER grant to explore how cell-cell junctions respond to strains of different magnitudes and rates. Better understanding these processes could shed light on the mechanics and potential treatments for diseases like cancer, genetic mutations of the heart and autoimmune skin conditions.

The project builds on Yang's paradigm-shifting development of a microscopic apparatus that mimics a cell-cell junction's physiology. The platform is attached to an atomic-force microscope, which replicates strains that junctions face.

Yang is studying what happens when a strain does not rupture a junction, but instead triggers the cell to elongate. He is pinpointing the signals that prompt this adaptation process, called mechanotransduction. He's also exploring what happens when stress ruptures a junction.

Yang is also discerning how cells and their junctions behave at different sites in the body – the heart versus the skin versus a blood vessel, for example.

Cell-cell junctions are crucial to human health. These protein structures enable cells to attach to each other, maintain tissue integrity and regulate communication between cells. They face a wide range of daily strains like cardiac pulses, digestion and skin stretching.

Ruiguo Yang, associate professor of mechanical and

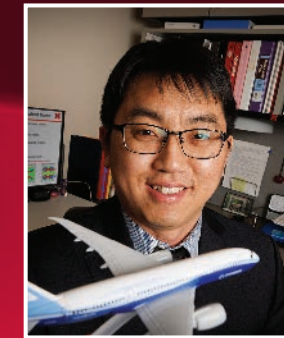
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Uncovering Mysteries of Turbulence



Jae Sung Park

Nebraska engineer Jae Sung Park is working on turbulence – the chaotic motion of a flowing substance like liquid or gas that affects everything from aviation and weather to human blood flow.

Scientists don't fully understand the rules governing turbulence. With a nearly \$509,000 CAREER award, Park is identifying patterns or orders in turbulent flows, then developing methods of exploiting them to mitigate their impact.

"Since turbulence is omnipresent, if we can more accurately predict how, when and where turbulence will happen, its impact would be enormous," said Park, assistant professor of mechanical and materials engineering. "We could save billions of dollars in energy usage and possibly save lives by predicting cardiovascular or major weather events."

Park focuses on vortices, the swirls that form when fluid layers mix. He will identify certain vortices that change turbulence, such as speed or directional flow. Using mathematical tools, his team will develop predictive computer models that anticipate the probabilities of where and when turbulence may create a new vortex.

He's also partnering with the Food Processing Center on Nebraska Innovation Campus to explore how reducing turbulence in piping systems could cut food industry costs.

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Improving Sexual Violence Reporting



Kathryn Holland

Federal guidelines regarding sexual violence on campus aim to protect people. But sometimes, institutions implement them in ways that don't align with survivors' best interests.

Kathryn Holland is using a \$500,000 CAREER grant to conduct the first multilevel exploration of mandatory reporting policies, a subset of federal Title IX law. She'll analyze institutional and individual data at two universities to understand how mandatory reporting policies function in the real world.

"We've only started to scratch the surface of the kind of empirical evidence we need to be able to understand these policies, how they're being implemented and their outcomes," said Holland, assistant professor of psychology and women's and gender studies.

In implementing mandatory reporting policies, institutions often require nearly all employees to report information about sexual misconduct to designated officials. But this means names and experiences are sometimes shared against survivors' wishes, resulting in increased post-traumatic stress.

Holland will study this misalignment by examining the text of university policies and conducting interviews. She'll integrate this information to show how the federal directives morph as they're interpreted.

The goal is providing results to help policymakers and advocates develop trauma-informed policies and better support survivors.

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Detecting Disease with Nanosensors



Nicole Iverson

Nitric oxide is a key player in living systems, but scientists don't fully understand its role in disease development. That's partially because it degrades in less than a millisecond, it degrades in the bloodstream, making it difficult to measure.

Nicole Iverson's research could help overcome this problem. With a \$550,000 CAREER grant, she's developing an easy-to-use nanosized nitric oxide sensor that could function as a tiny disease detector inside a cell.

Her sensor uses carbon nanotubes shaped like a straw, with a diameter of 1 nanometer – a billionth of a meter. Shining laser light on the tubes emits light initially, but when exposed to nitric oxide, the sensor turns off.

Using these sensors, Iverson is designing a platform that measures concentrations of nitric oxide and hydrogen peroxide, another biologically important molecule.

This technology could provide information about healthy and diseased cells.

"Imagine an insulin sensor for diabetics that could continuously detect what's going on in their blood. It's implanted annually, as opposed to a daily finger prick," said Iverson, associate professor of biological systems engineering. "It could save lives by getting us better information much faster."

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HIGHLIGHTS

Research and Creative Activity Highlights

Bringing AI to Farming



James Schnable



Olivia Meyer, research technologist and a graduate student in agronomy

Nebraska is helping the nation bring artificial intelligence to farming, strengthening the university's leadership in agricultural resilience.

UNL, in partnership with seven other institutions, launched the AI Institute for Resilient Agriculture. AIIRA is one of 18 National Science Foundation-led AI institutes.

AIIRA focuses on creating digital twins, or virtual copies, for use in agriculture. The AI technology will enable researchers and producers to simulate what-if scenarios and apply their findings to on-the-ground decision-making, leading to improved varieties and increased yields.

“Creating a digital twin means building a model of how plants perceive and respond to their environment,” said James Schnable, Charles O. Gardner Professor of Agronomy and AIIRA research member. A digital twin could be a single plant or an entire field.

Nebraska brings a uniquely diverse range of geography, climate and soils to the institute, he said.

Iowa State University leads this collaboration with Nebraska and six other institutions. Other partners include industry members, governments and commodity groups.

A \$20 million grant from the NSF and the U.S. Department of Agriculture's National Institute of Food and Agriculture funds AIIRA.

Improving Irrigation Efficiency

Soil moisture sensors help farmers maximize yields while conserving water. Yet few use them.

Nebraska hydrogeophysicist Trenton Franz gets it – sensors can be time-consuming. So he and his team developed a streamlined irrigation approach to help water users irrigate more efficiently.

Improving water efficiency is critical as global climate change threatens water resources.

Franz's team created an irrigation-scheduling algorithm that calculates water available in both the soil and atmosphere.

“That's fairly complicated, so this algorithm does a fairly nice job of trying to basically optimize the processes as well as making it more automatic,” said Franz, associate professor of hydrogeophysics and associate director for research in the School of Natural Resources.



Trenton Franz

The multidisciplinary team found that the algorithm-guided irrigation approach reduced irrigation water use by 24% while maintaining crop yields and increasing profits 11% and water productivity by 25%. As a result, the article said, this new methodology “could significantly improve water sustainability.” Results appeared in *Nature Communications*.



Record Gift Supports Depth Reporting

A Nebraska farm family has gifted its land to support Nebraska's College of Journalism and Mass Communications.

Proceeds from the \$4.65 million sale of land owned by the Martin and Doris Deepe family established the Deepe Family Endowed Chairs in Depth Reporting, the largest single gift the college has received.

It funds two new faculty: one specializing in investigative reporting and another in data journalism.

In an increasingly data-driven world, data literacy is an essential skill for journalists. The new faculty positions ensure Husker graduates have vital research skills and the funding to investigate significant stories in the Great Plains and tribal communities.

The gift enables the college to continue its depth reporting program, which has won numerous prestigious awards, including the Robert F. Kennedy Journalism Awards Grand Prize, said Shari Veil, college dean.

“The impact of the Deepe family's gift will be felt by generations of UNL journalism students,” she said.

Probing Cellular Metabolism's Role

Cellular metabolism likely plays a key role in controlling immune response to pathogens and cancer cells. Better understanding that role could lead to therapies that boost immunity.

Nebraska engineer Rajib Saha studies metabolic changes that occur when specific types of white blood cells encounter the bacteria *Staphylococcus aureus* and SARS-CoV-2, the virus that causes COVID-19.

He's also investigating how these white blood cells affect pancreatic cancer cell metabolism and whether cellular changes influence disease severity.

Saha, associate professor of chemical and biomolecular engineering, received a \$1.8 million Maximizing Investigators' Research Award from the National Institutes of Health for this research.

Saha's work is computational. His team creates computer models to determine how cells and pathogens might interact in a host. Colleagues test Saha's findings in the lab.

His research could also provide a template to investigate other diseases. Saha collaborates with the University of Nebraska Medical Center.



Rajib Saha and graduate student Niaz Bahar Chowdhury



Manufacturer Partners with Architecture

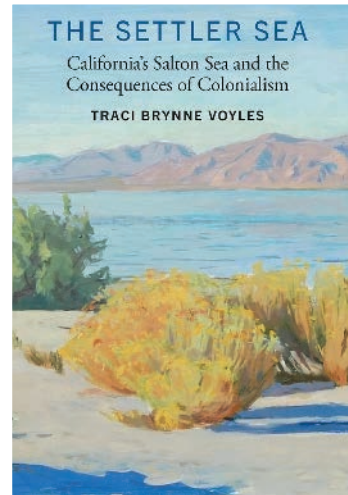
Nebraska's College of Architecture received a \$50,000 gift from the Nebraska-based manufacturer Timberlyne to establish the Sand Creek Post & Beam Design and Fabrication Fund.

The fund provides grants to support architecture faculty and students in wood construction research and fabrication. The gift promises to elevate design excellence, innovation and student engagement.

Husker alumni Jule Goeller and Len Dickinson founded Sand Creek Post & Beam Inc., now Timberlyne, in 2004 in Wayne, Nebraska. By investing in education and innovation, the couple seek to advance mass timber construction and encourage trends toward healthier living and a cleaner environment.

Architecture Program Director David Karle said, “It brings together faculty, students and industry partners to research and fabricate new and innovative solutions for mass timber. Through these experiential learning opportunities, our students can apply classroom knowledge to real-world scenarios.”

HIGHLIGHTS



Press Launches New Book Series

A new book series, Many Wests, builds on the University of Nebraska Press's longstanding leadership as a publisher in the history and culture of the American West.

The first book in the series, *The Settler Sea: California's Salton Sea and the Consequences of Colonialism* by Traci Brynne Voyles, was published in fall 2021. It is an original exploration of the Salton Sea, Southern California's largest inland water body.

Many Wests will publish distinguished scholarship that advances western history methods and topics. The books in the series will capture for scholars and general readers alike evolving interpretations of the history of the American West.

Forthcoming books in the series will explore topics including nature and the American empire, American Indian and American art of 20th century New Mexico, Indigenous foodways, the coal industry and Black Hills tourism.



Evaluating Employee Evaluations

Deciding to promote one employee over another may come down to the method used to evaluate them, a Nebraska study found.

Results suggest organizations should consider values and culture when selecting an evaluation system.

Todd Thornock, assistant professor of accountancy, and his University of Texas at Austin collaborator examined two common types of evaluations: one that holistically assigns an overall score and a disaggregated system that uses multiple ratings with underlying metrics.

They tasked students with evaluating two employees vying for assistant manager: one the better salesperson, the other with higher managerial potential.

With a promotion looming, students inflated the score of the second candidate – who was better suited for the position but lower performing in terms of sales – when using the holistic system. Students promoted that candidate 73% of the time, compared with 57% using the disaggregated evaluation.

Inflating holistic scores justifies promotions, while disaggregated systems curb subjectivity. Although holistic systems empower managers, the study suggests that organizations lacking trust or combating real or perceived biases may favor disaggregated methods.



HIGHLIGHTS



Grand Challenges



The University of Nebraska–Lincoln has committed \$40 million over four years toward strategic, goal-based solutions in seven thematic areas. The aim is to leverage Nebraska's expertise and strengths to solve some of society's greatest challenges.

Year One Summary

\$10M
INVESTMENTS MADE
IN 2022

13
FUNDED PROJECTS IN 2022:
3 CATALYST AWARDS
10 PLANNING GRANTS

178+
FACULTY AND STAFF INVOLVED
IN PROJECTS FUNDED DURING
YEAR ONE

9
ALL UNL COLLEGES ARE
PARTICIPATING IN AT LEAST
ONE FUNDED PROJECT

2022 CATALYST AWARDS

Catalyst awards are for specific goal-based projects with measurable outcomes. A rigorous external review process was used to evaluate proposals. Areas addressed by funded projects: anti-racism and racial equity, quantum science and engineering, health equity, and science and technology literacy for society.

\$2,959,840
AVERAGE AMOUNT OF CATALYST AWARDS

2022 PLANNING GRANTS

Planning grants support teams that are developing project ideas around one or more themes. Volunteer faculty reviewers evaluated the planning grant proposals. All thematic areas represented among planning grants.

\$138,948
AVERAGE AMOUNT OF A PLANNING GRANT

LEARN MORE 
research.unl.edu/grandchallenges

Accolades

Julia McQuillan and **Judy Walker** were named American Association for the Advancement of Science Fellows in 2021. Fellows are selected by their peers for scientifically or socially distinguished achievements that advance science or its application.

- McQuillan, Willa Cather Professor of Sociology, was recognized for contributions to the study of social inequality, particularly the areas of infertility, public understanding of science, removing inequalities in STEM fields and communicating science to a wide-ranging public.
- Walker, Aaron Douglas Professor of Mathematics, was recognized for distinguished contributions to algebraic coding theory, and substantial lasting achievements in advancing educational and career opportunities for women in mathematics.

Matthias Fuchs, associate professor of physics and astronomy, was named a Kavli Fellow of the National Academy of Sciences. Fellows are recipients of major national fellowships and awards and have been identified as future leaders in science. They gathered at the 2022 U.S. Kavli Frontiers of Science Symposium, where Fuchs presented research in his area of expertise – ultrafast and high-field X-ray science. At Nebraska, he’s a member of the Department of Physics and Astronomy’s Atomic, Molecular, Optical and Plasma Physics group. Fuchs has made significant contributions toward developing novel X-ray sources and investigating nonlinear effects at X-ray wavelengths.

Carl Nelson, professor of mechanical and materials engineering, was elected a senior member of the National Academy of Inventors. The honor recognizes

early stage innovators whose success in patents, licensing and commercialization has the potential to benefit society. For more than 15 years, Nelson has pursued medical engineering research that improves people’s lives. He holds 12 patents, five of them commercialized, in surgical robotics, particularly minimally invasive surgery and rehabilitation engineering. He developed the Intelligently Controlled Assistive Rehabilitation Elliptical training system, which helps people regain the ability to walk. He also designed a miniaturized surgical robotic technology used in colon resection procedures.

Valerie Jones, who holds the Seaton Distinguished Professorship in the College of Journalism and Mass Communications, received a Fulbright U.S. Scholar Award to study the use of emergent technology to facilitate social connectedness in aging adults. She will travel to Melbourne, Australia, to collaborate with global experts in the study of social connection, digital inclusion and public interest technology at the Social Innovation Research Institute at the Swinburne University of Technology. The team will explore how personal voice assistants, like Amazon’s Alexa, can be personalized and adapted to enhance feelings of connection in older adults living alone.

Patrice McMahon, professor of political science, will use a Fulbright U.S. Scholar Award to travel to Poznań, Poland, to advance her research on grassroots activism in Central Europe. Her work at Adam Mickiewicz University will focus on how nonstate actors – such as civil society organizations, universities and philanthropic groups – work with government to respond to transnational security threats like disease, civil conflict or interstate war. She’ll also teach a

graduate seminar on post-9/11 American foreign policy, connecting that class to a similar one at Nebraska to create a “global virtual classroom.”

Katie Edwards, associate professor of educational psychology, was named a fellow of the American Psychological Association. This distinction recognizes members who have made unusual and outstanding contributions in the field of psychology on a national level. Edwards’ interdisciplinary research focuses on the causes and consequences of interpersonal violence, primarily intimate partner violence and sexual assault among adolescents and emerging adults. She is especially interested in studying historically marginalized populations, such as sexual minority and Native American youth.

Robert Harveson, professor of plant pathology, was named a fellow of the American Phytopathological Society. Fellows are selected for significant contributions to research, teaching, professional service and beyond. Harveson was recognized for his work at the Panhandle Research and Extension Center, ...where he provides regional growers with services, training and education to reduce losses to specialty crop diseases. He is an internationally recognized leader in identifying diseases and devising management strategies for low-acreage crops including sugar beets, dry beans, sunflowers, chickpeas and potatoes.

Ryan Sullivan, clinical associate professor of law, received the 2022 Access to Justice Award from the Association of American Law Schools. The award, presented by the Section on Pro Bono and Public Service Opportunities, recognizes those who manage pro bono programs or work to remove barriers to justice. Sullivan

was honored for his commitment to pro bono and public interest work, and specifically for his work to launch the Tenant Assistance Project. Launched in April 2020, the project helps tenants avoid immediate eviction by providing defense packets, resources and representation.

Phillip Miller, Kermit Wagner Distinguished Professor of Animal Science, received the American Feed Industry Association Award in Nonruminant Nutrition Research from the American Society of Animal Science. The award recognizes an individual who has contributed to and published outstanding work in the last 10 years in nonruminant nutrition. Miller, a Husker faculty member since 1990, focuses on energy and amino acid nutrition in the growing pig, and how nutrition during gilt development affects sow longevity. More recently, he’s explored the impact of nutrition on the pig microbiome.

Timothy Schaffert, Susan J. Rosowski Professor of English, is author of *The Perfume Thief*, which was selected by Penguin Random House International for the One World One Book Program. Only two titles are selected annually for this global promotion, which will take the novel to bookstores worldwide. The novel follows Clementine, a queer American ex-pat and thief, who is drawn out of retirement and into a scam when the Nazis invade Paris. The book has received numerous accolades, including placement on the American Booksellers Association bestseller list and No. 1 bestseller status on Amazon in the category of LGBTQ+ Historical Fiction.



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