



UNIVERSITY OF
SOUTH DAKOTA

OFFICE OF RESEARCH & SPONSORED PROGRAMS
FY24 ANNUAL REPORT



MISSION STATEMENT

The University of South Dakota offers undergraduate, graduate and professional programs within the South Dakota System of Higher Education. As the oldest university in the state, the University of South Dakota serves as the flagship and the only public liberal arts university in the state.

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LETTER FROM THE VICE PRESIDENT

I am pleased to present the FY24 Annual Report for the Office of Research and Sponsored Programs (ORSP) at the University of South Dakota. This report highlights our continued efforts to enhance research engagement, foster collaboration, and support faculty and students in their scholarly pursuits.

We are proud to report a 40% increase in proposals from FY23 to FY24, reflecting the growing momentum and commitment within our research community. This year, ORSP undertook a significant update to our website, making resources such as proposal submission guidelines, direct access to Cayuse, and Pivot-RP tools more accessible. We are also excited to launch LinkedIn and Instagram platforms to showcase the groundbreaking research conducted at USD.

We have advanced research culture through our PI Research Development (PIRD) series, which supports principal investigators in crafting competitive grant proposals. Our “On the Menu” training program for program assistants also strengthens grant management across the university.

The successful modernization of the Cayuse research administration system includes enhanced tools to manage proposals and awards, offering a more user-friendly experience with expanded functionality for principal investigators. The introduction of Pivot-RP has streamlined funding searches, allowing researchers to discover new opportunities more efficiently, increasing our competitiveness for external funding.

The Technology Transfer Office (TTO) continues to support commercialization efforts, including managing intellectual property and providing entrepreneurial training through programs like NSF I-Corps. Additionally, the GEAR Center has expanded its role as an incubator for life-sciences companies, supporting research commercialization and economic growth.

This year, we secured several significant awards, including a \$1 million Department of Defense grant to build AI research capacity, a \$499,887 NSF award for enhancing STEM education, and funding to advance USD's high-performance computing cluster. In public service, we are proud to support opioid misuse disorder training and social work initiatives that address mental health provider shortages in South Dakota.

We continue to encourage student engagement in research, with programs like U.Discover and IdeaFest showcasing student achievements. Additionally, the USD Math Circle is launching this fall to enrich local students' math education.

This year's report reflects the dedication and innovative spirit of our research community. We are excited to continue building upon these achievements in the coming years.



Dan Engebretson, Ph.D.

Vice President for Research & Sponsored Programs

OFFICE OF SPONSORED PROGRAMS

The Office of Sponsored Programs (OSP) supports university researchers with proposals, contracts, and awards for federal grants, foundation grants, and incoming and outgoing subcontracts.

RESEARCH ENGAGEMENT AND AWARENESS ENHANCEMENT

In our ongoing commitment to bolster engagement with the research community and amplify the visibility of USD's research endeavors, the Office of Research and Sponsored Programs (ORSP) has undertaken a significant update to our website. This enhancement aims to highlight the evergreen resources available within our office.

We invite you to explore these resources at <https://www.usd.edu/orsp>, where you will find comprehensive information on proposal submission processes, direct links to Cayuse and Pivot-RP, and access to our YouTube channel, which features valuable research-related content.

Furthermore, in our efforts to showcase and promote the innovative research conducted on our campus, we are excited to announce the forthcoming launch of our LinkedIn and Instagram pages. These new social media platforms will serve to elevate awareness and spotlight the groundbreaking research achievements of our faculty and students.

Through these initiatives, we aim to foster a more vibrant and informed research community both within and beyond USD.

ADVANCING RESEARCH CULTURE THROUGH PI AND PA TRAINING

In our ongoing commitment to nurturing a vibrant research culture, we have made significant strides with our training programs for Principal Investigators (PIs) and Program Assistants (PAs).

The "PI Research Development" series (PIRD) is a key initiative aimed at enhancing the capabilities of our Principal Investigators. This series is designed to support PIs in developing more competitive grant proposals and to build a collaborative community of researchers. By fostering connections and encouraging collaboration, PIRD not only helps our researchers craft more compelling proposals but also strengthens their future grant submissions.

In parallel, our "On the Menu" training program addresses the needs of program assistants and secretaries across campus. This program focuses on topics related to grant

management and promotes collaboration among staff involved in research administration. Held once per semester, these gatherings are sponsored by the Office of Research and Sponsored Programs (ORSP) and provide a platform for networking and professional development.

Through these initiatives, we continue to engage and support our research community, enhancing both the quality of grant proposals and the effectiveness of research administration.

CAYUSE MODERNIZATION AND NEW ENHANCEMENTS

This year, we have successfully implemented the Cayuse Modernization initiative, which significantly enhances our research administration capabilities. Cayuse remains our primary system for managing external funding records, offering integrated tools that streamline administrative processes, reduce risks, and improve planning and data analytics.

The modernization introduces several key improvements, including the upcoming addition of Cayuse Fund Manager. Cayuse Fund Manager is a notable advancement, providing Principal Investigators (PIs) with greater control and visibility over their funding. This tool integrates seamlessly with systems such as Banner, offering detailed insights from portfolio overviews to specific activity details. It supports "what-if" scenarios for more accurate forecasting and generates comprehensive reports for stakeholders.

Key benefits of Cayuse Fund Manager include enhanced budget oversight for multi-year projects, with features such as financial summaries, burn rate analysis, and profit and loss statements. These tools assist in projecting future expenses and maintaining effective control over spending. Additionally, the Fund Manager tool supports improved stewardship by reducing data entry errors, increasing transparency, and fostering accountability.

Overall, these enhancements are designed to minimize administrative workloads, increase proposal submissions, and save time in proposal preparation, thereby advancing the efficiency and effectiveness of our research administration.

NOTABLE AWARDS



LAWRENCE 2.0: ENHANCING MULTI-DISCIPLINARY RESEARCH AND EDUCATION IN SOUTH DAKOTA

Ryan Johnson

Funding Amount: \$499,887

The Lawrence 2.0 project upgrades the high-performance computing cluster at the University of South Dakota (USD), advancing research and educational initiatives throughout South Dakota. It targets critical areas such as clean energy, sustainability, PTSD, and climate change, while also boosting USD's AI research capabilities. The upgraded cluster benefits STEM education at smaller institutions across the state and allocates unused compute cycles to the Open Science Grid (OSG) Open Science Pool.



BUILDING ARTIFICIAL INTELLIGENCE RESEARCH CAPACITY AT THE UNIVERSITY OF SOUTH DAKOTA

Dan Engebretson

Funding Amount: \$1,000,000

USD plans to utilize funding from the Department of Defense Established Program to Stimulate Competitive Research Capacity Building program to hire two faculty members specializing in AI/ML technology. The university has cultivated a research environment that enables young faculty to quickly advance their research and establish themselves as emerging leaders. This supportive environment will be essential for expanding USD's AI/ML capabilities and establishing the university as a leader in ethical and effective AI/ML technology.

ENHANCED FUNDING OPPORTUNITIES WITH PIVOT-RP ROLLOUT

The rollout of Pivot-RP marks a significant advancement in our efforts to support researchers with a comprehensive platform for identifying funding opportunities and potential collaborators. Pivot-RP serves as an essential tool for both discovering new sources of funding and connecting with collaborators, whether they are internal or external to USD.

This all-in-one platform streamlines the funding search process, eliminating the need to navigate multiple websites. Researchers can create and save personalized searches, and Pivot-RP will alert them to relevant opportunities, ensuring they stay informed about available grants from federal, state, private organizations, and nonprofits.

By centralizing access to funding information and offering valuable insights and shortcuts, Pivot-RP enhances our researchers' ability to secure funding and effectively share opportunities with potential candidates. This integrated approach supports our goal of maximizing funding acquisition and fostering a more efficient research environment.





INSTITUTIONAL REVIEW BOARD OFFICE

HUMAN SUBJECTS PROTECTION

The USD Institutional Review Board reviews all human subjects research studies taking place at USD or conducted by USD faculty to ensure projects follow federal and USD regulations and policies. The USD Office of Human Subjects Protection houses the IRB, and our staff works closely with faculty and student investigators throughout the year to ensure that any risks to the human participants in our research studies are as small as possible, and that research participants are properly informed about what enrolling in each study will involve.

The USD IRB is a committee made up of faculty, staff, and community members, and includes members with specialized areas of expertise such as neuroscientists, a Native American representative, and researchers experienced in working with children. The USD IRB also reviews studies for the Sioux Falls Veterans Administration and the Fargo Veterans Administration, and reviews some studies conducted by researchers not affiliated with USD.

STUDENT & FACULTY INVOLVEMENT IN RESEARCH

Faculty and students from all over campus are engaged in human subjects research, and our office ensures that all of them are properly trained in interacting with participants and handling sensitive data.

ACCREDITED SINCE 2005

The USD IRB is fully accredited by the Association for the Accreditation of Human Research Protection Programs (AAHRPP), the only IRB in the South Dakota Board of Regents system with this distinction, and one of only two accredited IRBs based in South Dakota. Accreditation is a signal to researchers, funding agencies, participants, anyone else in the research community that USD is committed to protecting research participants and holds its researchers and research projects to the highest ethical standards.





TECHNOLOGY TRANSFER OFFICE

The USD Technology Transfer Office (TTO), housed in the Office of Research and Sponsored Programs, supports the commercialization of university inventions to maximize society's benefit. The TTO also aims to provide service to faculty, cultivate industry interactions, and increase economic development in South Dakota. In addition, the TTO supports several programs for students, faculty, and South Dakota inventors to promote innovation, entrepreneurship, and economic development.

A major function of the TTO is to manage university intellectual property (IP) and facilitate its commercialization. When a faculty inventor submits an invention disclosure, the TTO works with the inventors, students, and the USD IP Committee to evaluate the patentability and commercialization potential of the invention. The TTO then facilitates filing patent applications for inventions that have reasonable potential to be licensed and developed into products that benefit society. The TTO also develops and maintains a network of industry connections to aid in commercializing USD technologies. This includes facilitating licensing negotiations between USD and companies.

The TTO also provides educational outreach to faculty and students covering intellectual property, SBIR/STTR opportunities, technology development and entrepreneurial programming at USD, and other entrepreneurial and funding resources available in South Dakota. In addition, the TTO processes material transfer agreements, non-disclosure agreements, and other research agreements. Metrics valuable in evaluating the impact of the TTO in commercializing university technologies include the amount of research funding, number of invention disclosures, number of patent applications, number of patents issued, and number of licensing agreements.

NSF I-CORPS GREAT PLAINS REGION

The National Science Foundation (NSF) Innovation Corps (I-Corps) is an immersive training program for undergraduate and graduate students, postdoctoral researchers, and faculty members to explore the commercial viability of technology-based innovative ideas. Participants in the five-week program receive training and experience in business model development, customer discovery, and entrepreneurship. The

program provides researchers with valuable market insight to inform the next steps in research and technology development, networking connections with industry experts and experienced entrepreneurs, and the tools needed to start a successful business. Teams typically consist of a Technical Lead (faculty member), an Entrepreneurial Lead (student), and an Industry Mentor. Since joining the NSF I-Corps Great Plains Regional hub in 2023, 16 USD teams have completed the training program at the regional level. USD also hosted and led its own regional I-Corps cohort during the summer of 2024. Of the USD teams that have completed the regional I-Corps training, two of those teams have gone on to complete the National I-Corps program and were awarded \$50,000 from NSF to assist with their customer discovery efforts. One of those teams consisted of faculty member Dr. Grigoriy Sereda, graduate student Sajith Wijewardhane, and business mentor Dr. Greg Bertsch. The other team consisted of faculty member Dr. Ranjeet John and graduate student Khushboo Jain. Vice President for Research Dan Engebretson and graduate student Tim Hartman were recently accepted into the National I-Corps program and will complete the training in late 2024.

NIH STARTUP CENTRAL

In the fall of 2023, USD partnered with the NIH Smart Tools to Accelerate Research Translation by Uplifting Participants for the Central IDeA State Region (STARTUP Central) pilot program. STARTUP Central aims to stimulate commercialization and innovation in the Central IDeA region, which includes South Dakota. STARTUP Central provides academic investigators with entrepreneurial education tools to efficiently translate scientific discoveries and technologies from research laboratories into commercial products to promote economic growth. In addition to completing a series of educational modules relating to entrepreneurship, commercialization, and technology development, participants in STARTUP Central may submit a proposal to be eligible for up to \$40,000 in Proof-of-Concept funds. At the end of the program, the goal is for participants to submit an NIH SBIR/STTR Phase I proposal. Three USD faculty were accepted into the STARTUP Central program and awarded Proof-of-Concept funds: Drs. Lisa MacFadden, Khosrow Rezvani, and Samuel Sathyanesan.

GEAR CENTER AND DISCOVERY DISTRICT

The USD Graduate Education and Applied Research (GEAR) Center serves as an incubator space for biomedical and life-science companies and is home to USD's Department of Biomedical Engineering. The GEAR Center also houses a current Good Manufacturing Practices (cGMP) suite for aseptic production of pharmaceutical products. GEAR Center tenants, USD students, and USD faculty have access to the cGMP suite along with state-of-the-art equipment through the Department of Biomedical Engineering for research and commercialization needs. In addition, the GEAR Center will complement the USD Discovery District, which is currently under construction near the GEAR Center and is set to open in early 2025. As the early-stage companies supported at the GEAR Center grow, they can transition to larger labs in the Discovery District. The GEAR is currently home to several tenants. Among the GEAR

tenants is Inanovate, a medical device-diagnostics company, and New Heritage Ag, which works on a plant gene editing technology. Mystic Ridge is also housed at GEAR and is working on an agriculture feasibility project. Consulting firms currently at the GEAR include SoDak Solutions, which specialize in guiding early-stage biotech companies from research to product development, and Copperleaf Consulting Group, which focuses on business development within the healthcare industry. TheI Consulting offers business consulting services across various sectors. Additionally, the GEAR is temporarily home to researchers from the Sioux Falls Veteran Affairs Health Care System while their research facility undergoes renovation. The GEAR continues to offer office and lab space for early-stage companies looking to grow in a supportive and dynamic environment.



ENVIRONMENTAL, HEALTH AND SAFETY

The Environmental, Health and Safety (EHS) Office provides resources to help protect our campus community and prevent our work from causing harm to the environment. We are dedicated to the integration of safety and environmental compliance into our culture and our behavior. In addition, we offer personal services such as laboratory safety, radiation safety, industrial hygiene, biosafety, laser safety, hazardous waste disposal, and ergonomics advice to the campus community.

TITLE V PROGRAM

The EHS and Facilities Management departments collaborate as key partners to ensure USD's compliance with EPA and SDANR-required air permits under the Clean Air Act. This partnership involves cooperation across all groups to continuously monitor and track emissions from 15 emergency generators and 3 boiler sources.

HAZARDOUS WASTE

In FY24, EHS personnel collected and processed 2,607 lbs. of hazardous chemical waste. This waste was consolidated by hazard class and shipped to EPA-registered disposal facilities. In addition to hazardous chemicals, EHS staff safely collected, containerized, and disposed of electronic, radiological, and biological waste in an environmentally responsible manner. A significant investment was made in the hazardous waste storage room to enhance general ventilation, fire safety, and install a floor-mounted fume hood.



LABORATORY DECOMMISSIONING

At some point, a research laboratory on campus will undergo closure due to factors like faculty retirement or departure from the university. In 2024, the Environmental Health and Safety (EHS) team successfully decommissioned two laboratories situated in the Lee Medical Building. EHS works diligently to ensure the appropriate decommissioning of labs that are no longer in use and minimizes any potential lingering safety hazards and ensures the compliant management of hazardous waste materials.

SPILL PREVENTION CONTROL AND COUNTERMEASURES PLAN

A Spill Prevention, Control, and Countermeasure (SPCC) plan is a regulatory document required by the EPA to prevent oil spills from reaching navigable waters or adjoining shorelines. The plan details procedures, methods, and equipment used to prevent oil discharges, ensuring environmental protection. In 2024, key elements of this plan were updated to enhance spill prevention, maintain emergency response capabilities, and ensure compliance with regulatory standards.

SHOWER/EYEWASH

USD's campus has 104 eyewash/safety shower stations (EW/SS). EW/SS are required to be located near all areas where persons work with hazardous materials. EHS staff perform monthly inspections on these units to confirm they can provide clean and temperate water to remove hazardous chemical contamination from individuals in the event of an emergency.

FUME HOODS

Fume hoods are a crucial piece of equipment for maintaining a safe and productive laboratory. Without them, lab workers would have limited protection from fires, explosions, poisonous gases and corrosive chemicals, making daily tasks dangerous or even impossible. EHS performed 103 fume hood inspections across Lee Medical, Patterson, Churchill-Haines, Pardee Labs and Akeley Science to verify proper operating airflows.



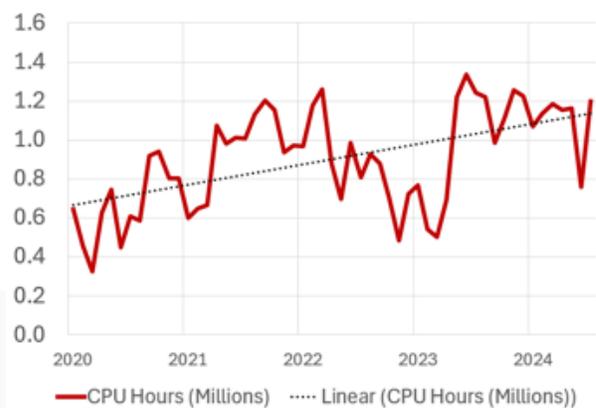
RESEARCH COMPUTING

USD's Research Computing Group works closely with the Office of Research and Sponsored Programs, providing computing and data storage services to USD researchers and their collaborators. USD's High-Performance Computing (HPC) cluster—Lawrence—has seen steady usage growth in recent years. Lawrence is available to all USD faculty, staff, and students free of charge. It accelerates USD and BRIN research applications in the fields of Chemistry, Physics, Biomedical Engineering, Computer Science, Neuroscience, Biology, Sustainability, and Psychology.

Lawrence is entirely externally funded (via a combination of National Science Foundation and South Dakota Board of Regents grants), and currently consists of 100+ computing nodes, including 9 Graphics Processing Units (GPUs) critical for Artificial Intelligence and Machine Learning applications spanning multiple scientific domains.

A 2024 National Science Foundation grant will increase USD's on-campus HPC capacity by approximately 50% in early 2025. This \$500,000 award—Lawrence 2.0: Advancing Multi-Disciplinary Research and Education in South Dakota—adds more than 1,000 CPU cores, 4 GPUs, and updated storage and central components.

USD is committed to open science and the responsible stewardship of resources, and in 2023 began contributing to the Open Science Grid (OSG), a national platform for sharing unused compute cycles to enable distributed high-throughput computing. According to OSG's Contributing Institutions dashboard, USD has run over 1.18M OSG jobs, impacting 46 research projects across 24 fields of science.



Total Monthly CPU Hours - 2020-Present

FY24 RESEARCH FUNDING HIGHLIGHTS

Top Proposals Submitted



\$106M
Sanford School of
Medicine



\$42M
Arts & Sciences

\$175M

Proposals submitted

\$14.6M
School of Health
Sciences

\$6.2M
School of Education

Government Funding



\$30M

Federal Research Funding

\$4.0M

State, Private & Other Funding

Top Federal Agencies



\$16.5M NIH



\$4.3M DOE



\$3.0M NSF



Top Research Funding Awards



\$34M

Total Research
Funding Awards

Sanford School of
Medicine

\$12.9M

Arts &
Sciences

\$6.7M

Administration

\$3.2M

\$3.0M

School of Health
Sciences

\$6.8M

School of
Education

USD LAUNCHES MATH CIRCLE PROGRAM TO ENRICH LOCAL STUDENTS' MATH EDUCATION

In fall 2024, the University of South Dakota Department of Mathematical Sciences will launch a Math Circle at Vermillion High School to develop and foster students' interest in mathematics.

By Hanna DeLange

Supported by the Mathematical Association of America – the world's largest community of mathematicians, students and enthusiasts – USD's Math Circle seeks to connect with local middle and high school students who are ready for more challenge in the study of mathematics and encourage them to further their mathematical studies.

"This is a unique opportunity for students to improve their knowledge with material that might never be presented in their classrooms, and elevate their skills as problem solvers, which is always important for mathematical success," said Catalin Georgescu, Ph.D., Department of Mathematical Sciences chair and USD Math Circle program director. "It will also be a chance to interact with college professors and get a feel of how things will be after high school."

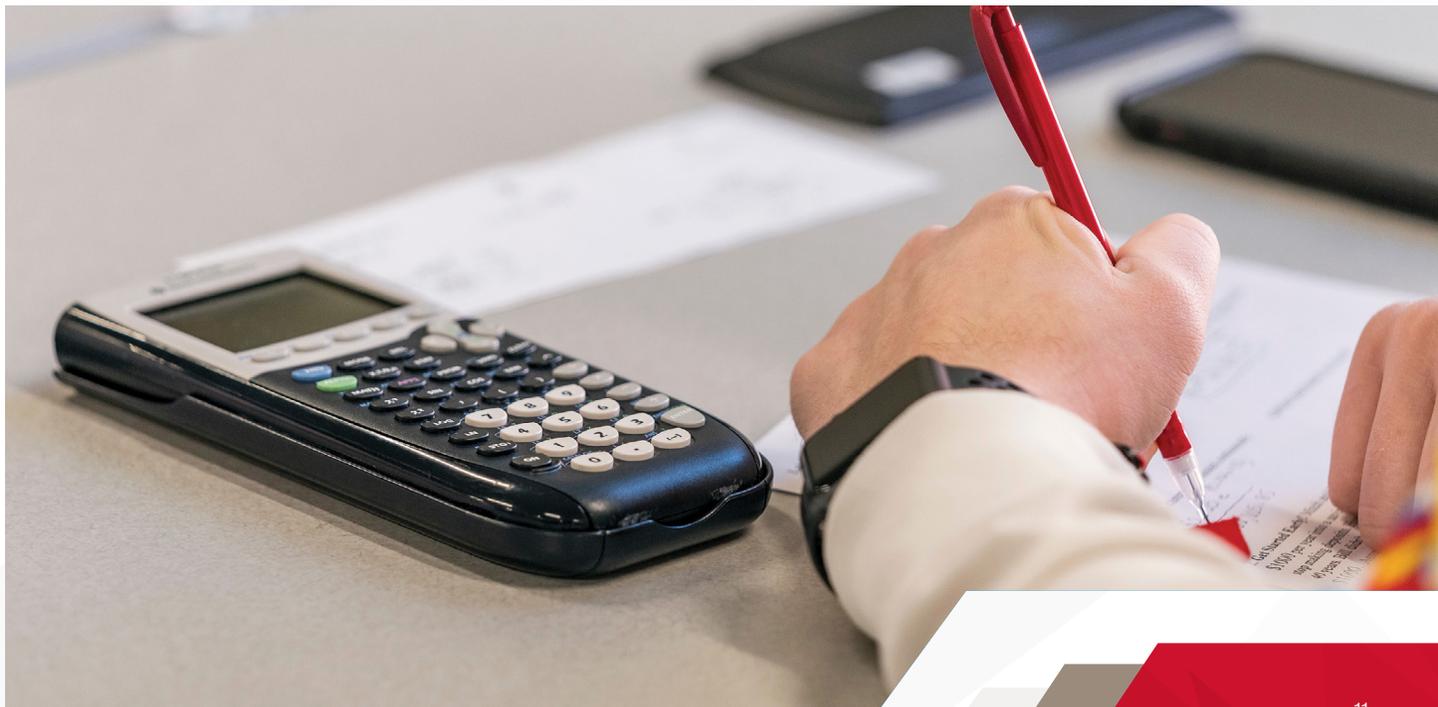
USD's Math Circle is an after-school program with the purpose of exposing students from grades 7-12 to topics not usually covered in the standard mathematical curriculum and to simultaneously prepare them for the American Mathematics

Competitions (AMC), such as AMC 10 and AMC 12. USD is the only higher education institution in the state to coordinate a Math Circle at the high school level.

"I hope to increase the level of mathematical readiness at Vermillion High School and the surrounding area," said Georgescu. "We want to create an engaging environment for these kids to thrive further in life and certainly to have some mathematical fun. There is no doubt mathematics is a very powerful tool for success in many careers."

The program will include two-hour sessions three times a month at Vermillion High School. USD Math Circle meetings will be problem-solving sessions, exposing students to modern topics in mathematics, open problems, and mathematical techniques outside of their usual high school content.

Support for the USD Math Circle is provided the Mathematical Association of America and the Mary P. Dolciani Halloran Foundation.





PHYSICIAN ASSISTANT FACULTY MEMBER ACQUIRES GRANT TO DELIVER OPIOID USE DISORDER TRAINING

Through a federal grant, a University of South Dakota professor is seeking to help end the devastating impacts that opioid misuse has on individuals, families and communities.

By Hanna DeLange

Katie Kassin, PA-C, a faculty member in USD's physician assistant program, has received a portion of a national opioid settlement, The Opioid Abatement and Remediation Fund, to utilize for opioid use disorder treatment, prevention and recovery programs in South Dakota. Sponsored by the South Dakota Department of Social Services and USD physician assistant program, the grant will provide training in medications for opioid use disorder (MOUD).

In 2022, the federal government passed the Medication Access and Training Expansion (MATE) Act, which went into effect last year. It requires all Drug Enforcement Administration (DEA)-registered practitioners, like physicians, physician assistants and nurse practitioners, to complete at least eight hours of training on opioid or other substance use disorders and the appropriate treatment of pain.

Kassin, the administrator for the grant, is planning to host a conference for health care professionals who work in family medicine and its sub-specialties to obtain those required hours of training. The conference will aid in furthering the

understanding and practice of medications and treatments for opioid use disorder in South Dakota communities.

Many medical providers lack the necessary tools and education to effectively care for individuals struggling with opioid use disorder (OUD), and this training serves as a tool for reaching South Dakotans who need this specialized care, Kassin says.

"This training serves as a crucial bridge, equipping physician assistants, nurse practitioners and physicians interested in integrating opioid use disorder care into their practices with invaluable insights into the latest advancements in OUD treatment modalities, best practices in patient management, and collaboration with peers to enhance their ability to deliver comprehensive care to those affected by this complex condition," she explains. "This training not only empowers health care professionals to make a meaningful difference in the lives of their patients but also plays a pivotal role in combating the opioid epidemic at its core."

SOCIAL WORK FUNDED OVER \$1 MILLION TO ADDRESS MENTAL HEALTH PROFESSIONAL SHORTAGE

The University of South Dakota Department of Social Work's Kelly Bass has been funded \$1.06 million to address the need for more mental health professionals in high-need and underserved areas of South Dakota.

By Hanna DeLange

The \$1,059,994 grant from the Health Resources and Services Administration (HRSA), an agency of the U.S. Department of Health and Human Services, will be administered over the next two years.

Bass, Ph.D., Department of Social Work chair, will serve as the principal investigator on the project. He and his colleagues will work to recruit and retain behavioral health providers in rural and underserved communities, specifically addressing the behavioral health needs of children, adolescent and youth aged 16-25.

The project, Clinical Opportunities for Mobilizing Professionals in Assisting South Dakota's Service gaps (COMPASS), will provide stipends to students in USD's Master of Social Work program, develop new clinic placements around the state, increase clinical professionals' support networks and provide career skills development and job opportunities.

Bass explained the need for such outreach. "All of South Dakota is in a mental health professional shortage, and most of the state is rural with the mental health of children and youth in the state showing problematic declines. Further, the state has shortages of social workers to meet these needs," he said.

Students in the COMPASS program will receive a stipend to complete several training elements, including a 250-hour clinical placement with a community mental health agency, the state psychiatric hospital or clinic that serves in another underserved area of South Dakota. Clinical supervisors will have their time paid to attend trainings and all social workers who attend will receive free CEUs.

The South Dakota Department of Social Services Behavioral Health Program will partner on all elements of this project. The state psychiatric hospital, Human Services Center, will partner to educate students on working in a psychiatric setting and have specific job placement efforts.



USD COLLABORATES ON \$8 MILLION NSF GRANT TO PROMOTE STEM EDUCATION, RESEARCH

University of South Dakota faculty members are collaborating on an \$8 million National Science Foundation (NSF) grant to meet the demand of creating pathways for young learners to develop interest and confidence in STEM and become motivated to work in STEM fields.

By Hanna DeLange

Led by Black Hills State University (BHSU), the project, “South Dakota Research Ecosystem Network: STEM Education, Community Engagement and Broadening Network Participation,” seeks to engage STEM researchers and K-12 teachers and students in South Dakota to create a pipeline for the next generation of the state’s STEM workforce.

“This grant will specifically address this need in South Dakota by implementing education, outreach and educational research in K-12 STEM education and by broadening participation so that STEM is accessible to all learners, including underrepresented populations,” said Dan Mourlam, Ed.D., chair of the Division of Teacher Residency & Education.

Participating USD faculty include Mourlam, the principal investigator of the USD collaborative grant, and senior personnel John Williams, Ed.D. '22, assistant professor of education; Kevin Reins, Ph.D., associate professor of mathematics education; and Meghann Jarchow, Ph.D., Department of Sustainability & Environment chair.

“USD’s role in leading the education research activities of this project uniquely positions us to conduct investigations into teacher knowledge and confidence, ultimately informing the design of STEM preservice teacher education and in-

service teacher professional development both in South Dakota and throughout the nation,” said Mourlam.

South Dakota was one of three states to secure the grant. Collaborating institutions include USD, BHSU, Oglala Lakota College, the South Dakota School of Mines and Technology, Dakota State University, South Dakota State University, Augustana University, Northern State University, Sinte Gleska University, Sisseton Wahpeton College, the Sanford Underground Research Facility and the South Dakota Discovery Center.

“It is significant that South Dakota was one of three states to be awarded this grant from the NSF, as they are very competitive,” said Mourlam. “It demonstrates that South Dakota is a leader in STEM education, research and innovation at a national level.”

The funds are awarded through the Established Program to Stimulate Competitive Research (EPSCoR) Collaborations for Optimizing Research Ecosystems Research Infrastructure Improvement Program (E-CORE RII) to enhance the state’s research and development (R&D) competitiveness and promote scientific progress nationwide.

THE GRANT AIMS TO ACHIEVE THE FOLLOWING KEY GOALS

- Engage scientists in South Dakota in professional development focused on how people learn, effective teaching, K-12 content standards related to their areas of expertise and how to support K-12 teachers.
- Develop K-12 teacher leaders through professional development and mentoring so that they are prepared to lead building- and district-level STEM education initiatives.
- Facilitate K-12 teacher professional development in computer science and computational thinking, environmental science and sustainability, the integration of STEM, and culturally relevant and sustaining instruction.
- Broaden participation and strengthen student identity in STEM through bridge programs at tribal colleges and universities, creating opportunities for students and facilitating community outreach activities through the state.
- Conduct educational research to further recognize the impact of the preceding four goals to better understand how teachers’ knowledge, understanding and confidence develops to inform teacher education programs in South Dakota and beyond.

ARTS & SCIENCES FACULTY RECEIVE COMBINED \$1 MILLION IN FUNDING FROM DEPARTMENT OF ENERGY

Two faculty members in the University of South Dakota College of Arts & Sciences received funding totaling \$1 million from the U.S. Department of Energy's (DOE) Funding for Accelerated, Inclusive Research (FAIR) initiative. USD's faculty, Dongming Mei, Ph.D., and Vijayalakshmi Saravanan, Ph.D., are the only recipients from South Dakota who received this highly competitive grant.

By Hanna DeLange

Through the FAIR initiative, the DOE's Office of Science is supporting mutually beneficial relationships between Minority Serving Institutions (MSIs)/Emerging Research Institutions (ERIs) and partnering institutions. The \$37 million in grant funding will help facilitate basic research in applied mathematics, biology, chemistry, computer science, engineering, geoscience, isotope research, materials science and physics at the selected institutions.

Mei, professor of physics and director of the Center for Ultra-Low Background Experiments at Dakota (CUBED), will receive \$564,300 over a 36-month award period for his proposed research project titled, "Demonstration of Home-Grown Crystals for Future SuperCDMS Experiment (DHGC-FSE)." Mei will work alongside a co-investigator from a DOE partner laboratory: Francisco Ponce, Ph.D., Pacific Northwest National Laboratory (PNNL).



Dongming Mei, Ph.D.

Dongming Mei. "Being selected as a recipient of the DOE FAIR grant and having the opportunity to collaborate with PNNL on the DHGC-FSE holds profound significance for me," said

Mei. "This collaboration represents a pivotal step toward advancing our understanding of fundamental physics through cutting-edge research.

"This opportunity is a testament to the power of collaboration in driving meaningful scientific progress and opens doors to exciting possibilities in the field of physics research," Mei continued.

Mei's DHGC-FSE project is dedicated to advancing cosmic frontier experiments in high-energy physics through the development of low-threshold, cryogenic germanium detectors. These detectors aim to explore the properties of dark matter and neutrinos, contributing to the understanding of the universe's composition.

Saravanan, assistant professor of computer science, will receive \$562,500 over a 36-month award period for her proposed research project titled "An Efficient Storage-Driven Machine Learning Model for Performance in the Era of Multimodal Scientific Data." Saravanan will



Vijayalakshmi Saravanan, Ph.D.

work alongside co-investigator Khaled Z. Ibrahim, Ph.D., from Lawrence Berkeley National Laboratory.

"Being selected for the FAIR grant not only offers financial support, but as a tenure-track faculty member, it will strengthen my career advancement," said Saravanan.

"Furthermore, given the growing computer science department at USD, this grant empowers our students to drive constructive transformations through their research endeavors, enriching the university's research portfolio and promoting the students' career growth."

Saravanan's project seeks to address issues of storage efficiency in high performance computing (HPC) by innovatively transforming data and leveraging recent advancements in artificial intelligence and machine learning techniques to accelerate real-time multimodal data processing and distributed data storage in HPC.

USD IS PART OF MAJOR NSF INVESTMENT TO BUILD CLIMATE RESILIENCE

The University of South Dakota is part of a project, funded by the U.S. National Science Foundation, to develop and assess modern controlled environment agricultural (CEA) practices to increase food security in tribal communities.

By Hanna DeLange



Meghann Jarchow, Ph.D.

The U.S. National Science Foundation announced on Tuesday a \$77.8 million investment in 14 projects through the Established Program to Stimulate Competitive Research (EPSCoR). Spanning 50 institutions across 21 jurisdictions, this investment aims to build research and development capacity and strengthen STEM education opportunities in states that have traditionally lower levels of funding.

Meghann Jarchow, Ph.D., chair of the Department of Sustainability & Environment, is USD's principal investigator (PI) and will be part of the "Harnessing Controlled Environment Agriculture to Secure Sustainability and Economic Growth" project.

The project aims to develop and assess modern CEA practices that will help tribal communities secure food production, develop a climate-smart workforce and stimulate economic growth.

Jarchow explained that a controlled environment provides an avenue for food production to continue, despite harsh climates, in a sustainable way.

USD is partnering with the University of New Mexico, University of Wyoming, New Mexico State University, Santa Fe Community College and a number of tribal nations.

"I am excited about the broad spatial scale of this research – from New Mexico to Wyoming to South Dakota," said Jarchow. "This region spans hyper-arid to humid climates, which will provide an exceptional range through which to study

CEA. This project brings together researchers, practitioners and educators from a wide geographic region to explore the plant biology, desirability and life cycle impacts of CEA across this region. The Lakota, Navajo, Northern Arapaho and Eastern Shoshone tribes who are part of this project all have food sovereignty efforts, and we are excited to be able to work with them to study CEA across the region."

The NSF EPSCoR Research Infrastructure Improvement-Focused EPSCoR Collaborations Program awards will support interdisciplinary research teams working across jurisdictions to advance climate change research and build resilience in disproportionately affected communities nationwide. These teams, which include a diverse array of academic institutions and partners from government, industry and nonprofits, will leverage their collaborative efforts to develop climate adaptation and mitigation strategies, expand STEM opportunities and drive economic growth.

"Every part of our nation has been impacted by the changing climate. We build a sustainable future for all by investing in climate resilience research and solutions across our country," said NSF Director Sethuraman Panchanathan. "By empowering researchers from different EPSCoR jurisdictions and enabling collaborations across diverse institutions from the Mountain West to the Gulf Coast, from the Southwest to the mid-Atlantic and New England and beyond, we are driving innovation that fosters STEM opportunities, economic growth and climate resilient communities."





AWARDS RECEIVED

TOTAL AWARD DOLLARS

College/School	FY19	FY20	FY21	FY22	FY23	FY24
Administration	\$3,223,036	\$732,525	\$2,419,176	\$3,965,325	\$2,305,836	\$3,236,852
Arts & Sciences	\$8,609,680	\$6,042,864	\$5,230,932	\$6,465,476	\$7,093,977	\$6,857,914
Business	\$4,302,360	\$3,917,938	\$1,694,288	\$3,097,971	\$1,053,757	\$1,042,777
Education	\$3,138,461	\$2,785,168	\$6,718,208	\$3,633,825	\$4,164,293	\$6,781,830
Fine Arts	\$54,500	\$181,575	\$960	\$11,717	\$250	\$39,475
Health Sciences	\$1,162,501	\$1,910,086	\$2,009,500	\$3,895,641	\$6,119,277	\$2,980,506
Law	\$90,000	\$100,000	\$100,000	\$77,045	\$10,000	\$70,010
Medicine	\$16,101,097	\$10,207,341	\$13,724,639	\$16,788,924	\$14,845,329	\$12,950,963
Total	\$36,681,634	\$25,877,497	\$31,897,703	\$37,935,923	\$35,592,719	\$33,960,327

NUMBER OF AWARDS

College/School	FY19	FY20	FY21	FY22	FY23	FY24
Administration	20	13	16	19	13	14
Arts & Sciences	54	46	31	43	50	52
Business	23	10	6	8	5	4
Education	18	8	19	14	14	12
Fine Arts	4	2	1	6	1	4
Health Sciences	20	18	22	31	31	34
Law	1	2	2	1	1	1
Medicine	59	59	62	71	61	52
Total	199	158	159	193	176	173

COLLEGE OF ARTS & SCIENCES

Department	FY19		FY20		FY21		FY22		FY23		FY24	
	Amount	No.										
Anthropology (including Archeology)	\$15,824	1	\$109,822	2	\$18,176	1			\$1,671	1	\$6,250	1
Biology	\$1,761,808	14	\$968,992	10	\$1,054,340	9	\$1,297,126	12	\$1,448,482	13	\$1,899,020	17
Biomedical Engineering	\$1,315,458	7	\$2,248,866	8	\$990,519	5	\$1,247,990	6	\$720,805	2	\$713,506	3
Chemistry	\$2,406,238	12	\$1,309,180	7	\$1,227,361	5	\$756,135	5	\$2,237,449	12	\$1,001,689	9
Communication Sciences & Disorders	\$192,000	3	\$3,915	1	\$261,600	2	\$5,999	1	\$6,786	1	\$163,400	1
Computer Science											\$562,500	1
Counselor Center											\$36,036	1
English			\$5,000	1			\$6,425	1	\$9,638	1	\$4,500	2
Government Research Bureau											\$44,765	3
History			\$500	1					\$6,903	2		
Mathematics	\$41,740	1									\$5,000	1
Modern Languages	\$3,375	1	\$3,229	1	\$958	1						
Physics	\$2,696,695	8	\$294,405	4	\$933,554	1	\$1,918,248	6	\$209,000	4	\$1,190,767	5
Philosophy			\$375	1			\$100,482	2				
Political Science	\$37,195	1	\$263,401	5	\$72,172	3	\$29,615	1	\$29,615	1	\$83,759	2
Psychology (including DMHI)	\$107,084	3	\$744,882	2	\$575,630	1	\$1,025,507	2	\$1,305,270	4	\$995,253	2
Sustainability & Environment	\$32,263	3	\$90,297	3	\$96,622	3	\$77,949	7	\$1,118,358	9	\$58,955	3
Teacher Residency											\$92,514	1
Total	\$8,609,680	54	\$6,042,864	46	\$5,230,932	31	\$6,465,476	43	\$7,093,977	50	\$6,857,914	52

SANFORD SCHOOL OF MEDICINE

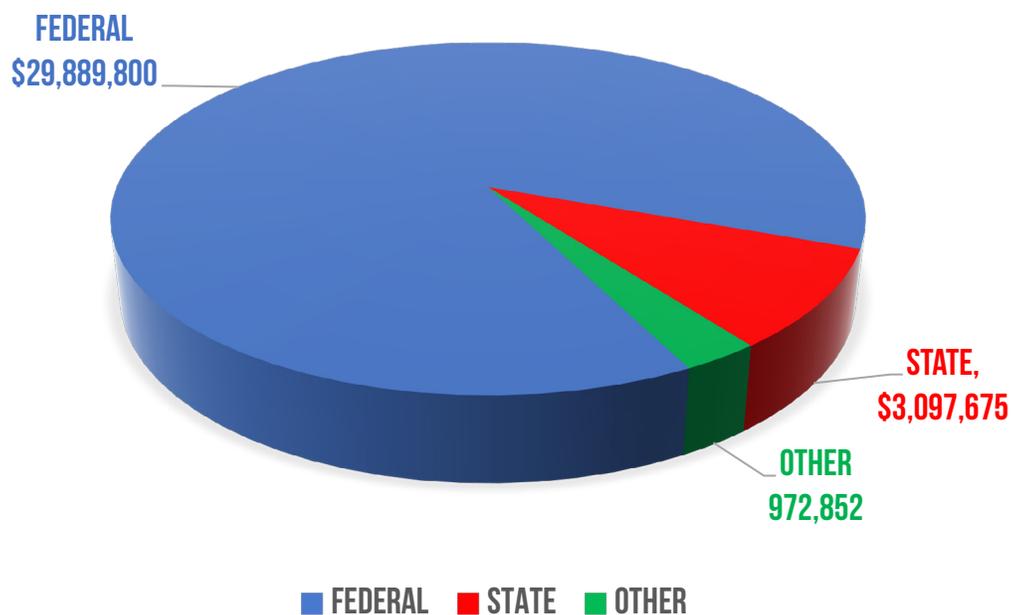
Department	FY19		FY20		FY21		FY22		FY23		FY24	
	Amount	No.	Amount	No.	Amount	No.	Amount	No.	Amount	No.	Amount	No.
Basic Biomedical Sciences	\$11,972,130	30	\$5,260,153	26	\$9,373,593	32			\$9,655,750	30	\$7,881,968	26
Cardiovascular Research Institute												
Center for Disabilities	\$3,216,142	15	\$3,400,917	15	\$2,726,810	16	\$4,001,313	23	\$3,812,959	23	\$3,430,415	14
Family Medicine	\$658,762	8	\$1,213,173	7	\$1,302,034	8	\$1,290,469	6	\$918,320	3	\$916,396	4
Dean of the Med School			\$54,000	2	\$12,500	2					\$5,000	2
Internal Medicine											\$36,148	1
Pediatrics	\$38,582	2	\$56,500	1		1						
SSOM Faculty Research							\$35,326	1	\$35,445	1		
Surgery	\$215,481	4	\$222,598	3	\$309,703	3	\$333,534		\$422,855	4	\$681,036	5
Total	\$16,101,097	59	\$10,207,341	54	\$13,724,640	62	\$5,660,642	30	\$14,845,329	61	\$12,950,963	52

SANFORD SCHOOL OF HEALTH SCIENCES

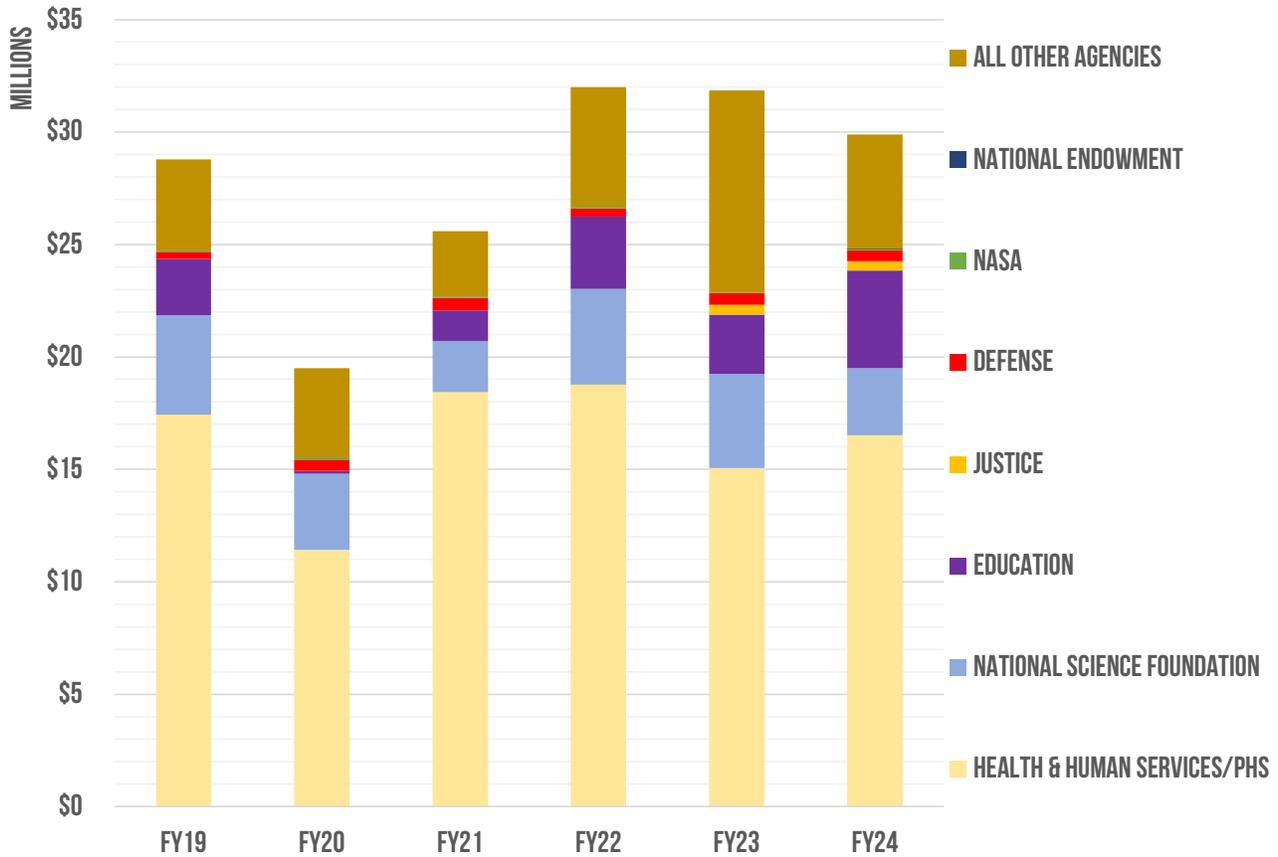
Department	FY19		FY20		FY21		FY22		FY23		FY24	
	Amount	No.										
Addiction Studies					\$229,485	1	\$50,000	1			\$11,704	1
Center Prevention of Child Mlt	\$578,650	9	\$54,840	5	\$198,987	6	\$2,454,600	11	\$1,356,335	5	\$370,667	4
Dean of Health Sciences	\$95,355	1	\$775,565	4	\$345,000	4	\$265,000	3	\$791,120	14	\$1,211,204	18
Dental Hygiene	\$200,000	1	\$207,500	3			\$41,159	1	\$30,000	2	\$25,000	1
Health Sciences Major	\$23,000	2	\$59,200	4	\$5,200	2	\$10,400	4			\$3,500	1
Masters of Public Health	\$73,896	2	\$610,098	3	\$941,481	3	\$542,424	5	\$511,291	4	\$203,497	1
Occupational Therapy	\$19,970	2	\$19,963	1			\$200,000	1	\$48,000	1		
Physical Therapy	\$24,957	1									\$251,786	2
Physician Assistant											\$32,653	1
Social Work			\$177,920	2	\$159,592	1	\$239,551	2	\$22,550	1	\$550,288	3
USD Nursing Program	\$146,673	2	\$5,000	1	\$129,755	5	\$52,507	2	\$3,359,981	4	\$320,207	2
Total	\$1,162,501	20	\$1,910,086	23	\$2,009,500	22	\$3,855,641	30	\$6,119,277	31	\$2,980,506	34

AWARDS BY SOURCE OF FUNDS

College/School	Federal		State		Other Non-Profit		Total	
	Amount	No.	Amount	No.	Amount	No.	Amount	No.
Administration	\$3,156,677	10	\$79,175	3	\$1,000	1	\$3,236,852	14
Arts and Sciences	\$6,017,067	35	\$348,856	7	\$491,991	10	\$6,857,914	52
Basic Biomedical Sciences	\$6,882,719	21	\$645,902	3	\$353,347	2	\$7,881,968	26
Beacom School of Business	\$1,042,777	4					\$1,042,777	4
School of Education	\$6,721,497	10	\$36,333	1	\$24,000	1	\$6,781,830	12
College of Fine Arts	\$2,600	2			\$36,875	2	\$39,475	4
School of Health Sciences	\$2,447,176	18	\$475,691	12	\$57,639	6	\$2,980,506	34
Knudson School of Law	\$70,010	1					\$70,010	1
Sanford School of Medicine	\$3,549,277	16	\$1,511,718	7	\$8,000	1	\$5,068,995	26
Total	\$29,889,800	117	\$3,097,675	33	\$972,852	23	\$33,960,327	173



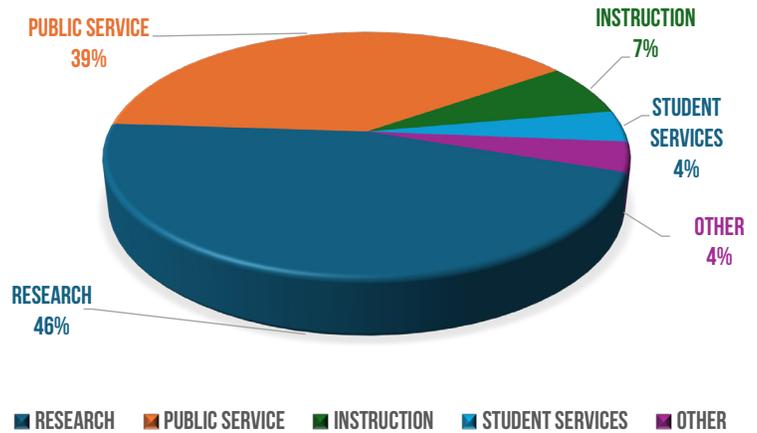
FEDERAL AWARD DOLLARS BY AGENCY



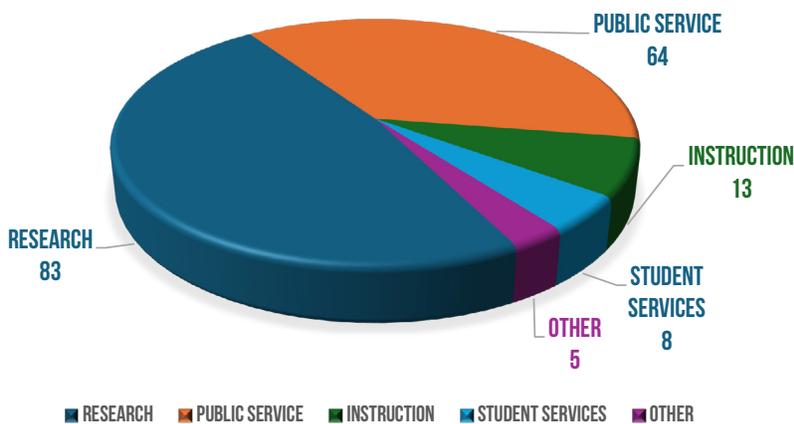
Federal Agency	FY19	FY20	FY21	FY22	FY23	FY24
Health & Human Services/PHS	\$17,432,089	\$11,418,197	\$18,430,992	\$18,771,698	\$15,058,594	\$16,514,707
National Science Foundation	\$4,429,601	\$3,383,954	\$2,270,874	\$4,246,321	\$4,195,285	\$2,994,584
Education	\$2,504,321	\$139,366	\$1,371,316	\$3,215,056	\$2,625,913	\$4,319,460
Justice					\$432,856	\$432,856
Defense	\$305,914	\$499,124	\$546,738	\$353,285	\$518,033	\$478,069
NASA	\$56,922	\$105,038	\$78,443	\$89,093	\$45,675	\$59,867
All other agencies	\$4,046,375	\$3,960,385	\$2,900,577	\$5,314,545	\$8,977,070	\$5,082,157
National Endowment						\$8,100
Total	\$28,775,222	\$19,506,064	\$25,598,940	\$31,989,998	\$31,853,426	\$29,889,800

AWARD DOLLARS BY TYPE OF PROJECT

Project Type	Amount
Research	\$15,553,392
Public Service	\$13,314,738
Instruction	\$2,339,195
Student Services	\$1,416,151
Other	\$1,336,851
Total	\$33,960,327



AWARDS BY TYPE OF PROJECT

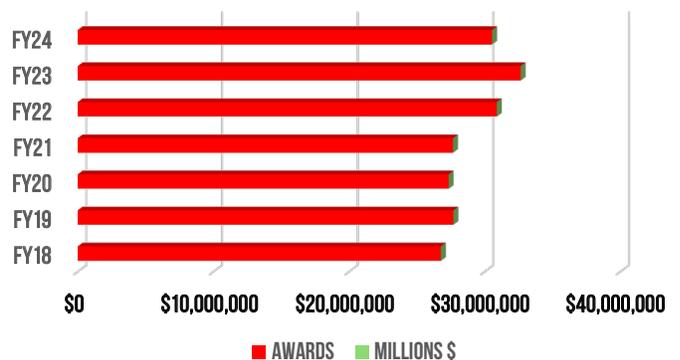


Project Type	No.
Research	83
Public Service	64
Instruction	13
Student Services	8
Other	5
Total	173

EXPENDITURES

FY	Grant Expenditures	Millions \$
FY18	\$26,767,648	26.768
FY19	\$27,684,938	27.685
FY20	\$27,341,261	27.341
FY21	\$27,662,015	27.662
FY22	\$30,890,170	30.890
FY23	\$32,650,213	32.650
FY24	\$30,539,713	30.539

SPONSORED EXPENDITURES



PRESIDENT'S AWARDS *for* RESEARCH EXCELLENCE, CREATIVITY, & INNOVATION & ENTREPRENEURSHIP

These awards recognize research and creative activity that make extraordinary contributions to knowledge and artistic expression.



ESTABLISHED FACULTY OR STAFF

GABRIELLE STROUSE, PH.D.

Associate Professor, Counseling & Psychology in Education



INNOVATION AND ENTREPRENEURSHIP

CORAL DIRKS, PH.D.

Assistant Professor, Communication Sciences & Disorders



EARLY/MID-CAREER FACULTY OR STAFF

JOSE PIETRI, PH.D.

Assistant Professor, Basic Biomedical Sciences



CREATIVITY

LEAH MCCORMACK, PH.D.

Assistant Professor, Department of English

**SCAN TO READ MORE ABOUT
PRESIDENT'S AWARD WINNERS.**





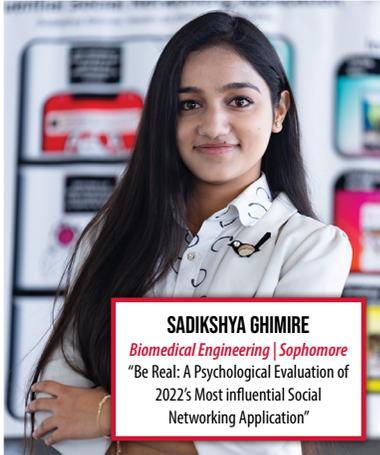
WYATT WIEBELHAUS
Sustainability | Senior
 "Kicking Up Dust on Utah's Off-Road Vehicle Trails: PI-SWERL Assessment of Anthropogenic Dust Emissions"



VERONICA KNIPPLING
Graphic Design | Senior
 "The Stilwell Papers"



GRANT BUDDEN
Medical Biology | Senior
 "Monitoring Selenium Bioaccumulation in False Map Turtles"



SADIKSHYA GHIMIRE
Biomedical Engineering | Sophomore
 "Be Real: A Psychological Evaluation of 2022's Most Influential Social Networking Application"



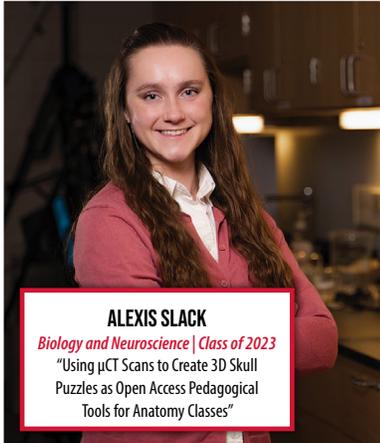
OLIVIA ROBERTS
Mathematics; Music Minor | Senior
 "Understanding Musical Systems with Zn – Cayley Graphs"



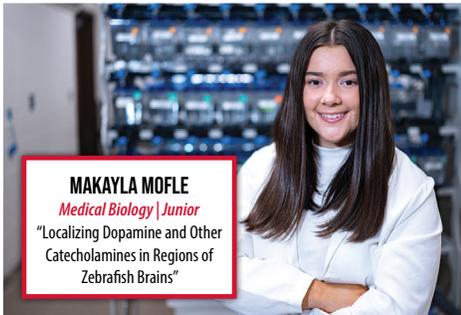
ELLEN MALLORY
Health Sciences | Senior
 "Public Health Interventions for Mental Health Issues at Colleges and Universities"

UNDERGRADUATE RESEARCH Excellence AWARDS · 2024

READ MORE ABOUT STUDENTS' RESEARCH



ALEXIS SLACK
Biology and Neuroscience | Class of 2023
 "Using µCT Scans to Create 3D Skull Puzzles as Open Access Pedagogical Tools for Anatomy Classes"



MAKAYLA MOFLE
Medical Biology | Junior
 "Localizing Dopamine and Other Catecholamines in Regions of Zebrafish Brains"



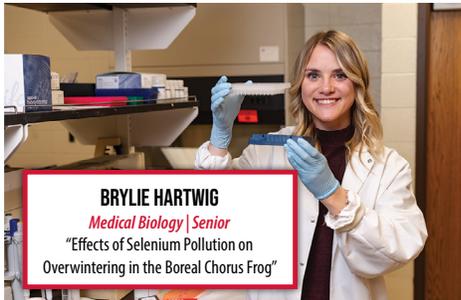
JORDAN GROTHE
Mathematics | Senior
 "Analyzing Heat Generated from Electro-Osmotic Flow Utilizing Computational Fluid Dynamics"



EVAN SIPPEL
Political Science and History | Sophomore
 "Impact of the Top-Two Primary on Electoral Competition in California"



GABRIELLA BEBERG
Medical Biology | Senior
 "Does Length Change in Telomeres Between Hatchlings, Fledglings, and One-Year Old Chestnut-Crowned Babblers Predict Reproductive Behavior in a Cooperatively Breeding Species?"



BRYLIE HARTWIG
Medical Biology | Senior
 "Effects of Selenium Pollution on Overwintering in the Boreal Chorus Frog"

UNDERGRADUATE RESEARCH

NATIONAL CONFERENCE ON UNDERGRADUATE RESEARCH

The National Conference on Undergraduate Research (NCUR) is dedicated to promoting undergraduate research, scholarship, and creative activity in all fields of study by sponsoring an annual conference for students across the United States. In spring 2024, five outstanding University of South Dakota students presented their research at California State University – Long Beach (CSULB), Long Beach, California, during the annual meeting. We are fortunate to have the following students represent USD at this important event: Makayla Mofle (junior), Olivia Roberts (senior), Jordan Grothe (senior), Kamila Haliru (junior), and Grant Budden (senior).



SD EPSCOR

The South Dakota Established Program to Stimulate Competitive Research (SD EPSCoR) and South Dakota Board of Regents (SDBOR) hosted an undergraduate research poster session at the state capital on February 29, 2024. The goal of this event is to showcase cutting-edge undergraduate projects happening across the state. University of South Dakota students, Talia DeWitte (bottom, second from left) and Hugo Morvan (top, left), presented their works along with eight other undergraduate researchers from across the other South Dakota state institutions. From the EPSCoR site, "Research involvement requires initiative that goes well beyond that of the regular classroom and develops problem-solving skills and specialized expertise."

sdepscor.org/2024-sd-student-research-poster-session



CURCS

To support undergraduates in their research and presentation endeavors, the Council for Undergraduate Research and Creative Scholarship (CURCS) awards multiple mini-grants to undergraduate student applicants. These grants help to cover research and creative scholarship expenses and to help offset the cost of travel to continue research or attend research conferences.

In 2024, 43 students were awarded the CURCS grant with awards ranging between \$750 and \$1,000 each. The total amount granted was \$33,250. Projects came from many areas on campus including Biology, Basic Biomedical Sciences, Economics, and Photography. A few examples of granted projects are:

- **Specializations of the chameleon pectoral and pelvic girdles to differing levels of arboreality (Cydney Even, Medical Biology)**
- **Integrating English Language Arts in K-3 Social Studies (Lily Hilt, Elementary Education)**
- **Capturing South Dakota's Small Town Treasures (Jerrod Bauder, Photography)**
- **Nanoparticles encapsulating Veratridine for the treatment of Colorectal Cancer (Kate Schraufnagel, Biochemistry)**



U.DISCOVER

The U.Discover Program is an opportunity for undergraduate students to perform research or creative scholarship over ten weeks during the summer under the guidance of a faculty mentor. Students receive a stipend for working on their research during this ten-week program.

In 2024, twenty students were awarded grants up to \$5,500 each with a total of \$110,000 granted. USD is proud to award these grants to students studying in several colleges and schools. ORSP is thrilled to invest in these incredible scholars and their research. A few examples of funded research are:

- **Biomechanically Informed Rehabilitation System Using Arduino for Knee and Hip Extension (Nicole Chikosi, Biomedical Engineering)**
- **A Case Study of Ungrading on Student Learning in Higher Education (Brooke Creviston, Elementary Education)**
- **The Impact of Artificial Intelligence on the Quality of Higher Education (Pragati Rouniyar, Computer Science)**
- **Reducing Stigma towards Alcohol Use Disorder (AUD): A Parasocial Contact Approach (Prah Haider, Psychology)**

IDEAFEST

For over 35 years, the University of South Dakota has hosted IdeaFest, a two-day, annual research symposium showcasing student research and creative scholarship. Students have the opportunity to present their creative scholarship and research in a variety of ways: poster presentations, oral sessions, performing arts presentations, and faculty-moderated panels. Select students were also included in a demonstration of presenting their undergraduate honors thesis in under three minutes.

Nearly 300 students participated in IdeaFest 2024. Of these, 150 students were undergraduate students representing every college and school across the USD campus. It is truly inspiring to see how the future of USD research and creative scholarship is being shaped in such a cohesive event.

sites.google.com/usd.edu/ideafest/home







UNIVERSITY OF
SOUTH DAKOTA

