



# 2022 **ANNUAL REPORT**

VICE PRESIDENT FOR RESEARCH AND PARTNERSHIPS



**VICE PRESIDENT FOR  
RESEARCH AND PARTNERSHIPS**  
*The UNIVERSITY of OKLAHOMA*

## **Igniting and Catalyzing Excellence in Research and Creative Activities to Change Lives**

Since the launch of the “Lead On, University” Strategic Plan in July 2020, the University of Oklahoma has embraced its role as the state’s leading research university with renewed focus. Pillar 5 of the Strategic Plan describes the strategies and tactics needed to “Enrich and Positively Impact Oklahoma, the Nation, and the World through Research and Creative Activity.” Among those strategies, Strategy 2 introduces the key areas in which OU is well positioned to develop convergent, transdisciplinary support for research that can have significant impact on local, regional, national, and global challenges. At the Office of the Vice President for Research and Partnerships, we are creating an environment that empowers faculty, staff, and students to achieve these goals. In many ways, 2022 was a benchmark year. Now two years into the execution of the university’s strategic plan, we’re seeing significant progress in the volume and impact of research taking place across the university’s eight strategic and foundational research areas described within this report. In the following pages, we invite you to join us as we reflect and celebrate a few of the highlights from the past year.



**Tomás Díaz de la Rubia**  
Vice President for Research and Partnerships  
The University of Oklahoma

**Vice President for Research and Partnerships**  
Tomás Díaz de la Rubia

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**1**

## **STRATEGIC RESEARCH FRAMEWORK**

Pillar 5 of the Lead On, University Strategic Plan and our Strategic Research Framework describes the ambition to solve global grand challenges. True solutions that can garner positive social impact require working across and beyond traditional academic boundaries.

**3**

## **BY THE NUMBERS**

OU research is breaking records. Our research growth continues to gain momentum as we make strides toward realizing the Lead On, Strategic Plan.

**7**

## **UNIVERSITY-WIDE STRATEGIC VERTICAL INSTITUTES & CENTERS**

Read about the recent milestones and achievements realized by our OVRP-led centers and institutes over the past year.

**29**

## **SOWING SEEDS**

The Office of the Vice President for Research and Partnerships is sowing the seeds of research excellence through seven recent internal seed funding and research investment programs.

**33**

## **HONORIFICS**

Congratulations to the faculty who are leading their fields and received prestigious professional recognitions within the past year.

# STRATEGIC RESEARCH FRAMEWORK

OU'S RESEARCH STRATEGY EMERGES FROM 21ST CENTURY GLOBAL GRAND CHALLENGES



# STRATEGIC RESEARCH VERTICALS

## AEROSPACE, DEFENSE, AND GLOBAL SECURITY

Oklahoma Aerospace and Defense  
Innovation Institute (OADII)



Gene Kirkland,  
Executive Director

## ENVIRONMENT, ENERGY, AND SUSTAINABILITY

Institute for Resilient Environmental  
and Energy Systems (IREES)



Tim Filley, Director

## THE FUTURE OF HEALTH

Integrative Life Sciences Institute

Director to be  
appointed in FY23

## SOCIETY AND COMMUNITY TRANSFORMATION

Institute for Community and Society  
Transformation (ICAST)



Shane Connelly,  
Director

## CROSS CUTTING FOUNDATIONS

### > Data Institute for Societal Challenges (DISC)

David Ebert, Director

### > Center for Quantum Research and Technology (CQRT)

Thirumalai "Venky" Venkatesan, Executive Director

### > Institute for Public Policy Research and Analysis (IPPRA)

Hank Jenkins-Smith, Co-Director | Carol Silva, Co-Director

### > Advanced Radar Research Center (ARRC)

Robert Palmer, Executive Director



# **BY THE NUMBERS**

# RECORD BREAKING ACHIEVEMENTS FOR THE UNIVERSITY OF OKLAHOMA - NORMAN CAMPUS

**28** FY22 AWARDS  
>>\$1 MILLION<sup>1</sup>

**\$257** MILLION

**R&D EXPENDITURES**

9% INCREASE FROM FY21

**\$137** MILLION

**FEDERAL EXPENDITURES**

11% INCREASE FROM FY21

**725** FY22 TOTAL  
AWARDS RECEIVED<sup>1</sup>

**#7** **\$91M** ATMOSPHERIC, GEOLOGICAL & OCEAN SCIENCES  
7% INCREASE FROM FY20

**#1** **\$81.6M** ATMOSPHERIC SCIENCE & METEOROLOGY  
8% INCREASE FROM FY20

**#30** **\$46M** NON-SCIENCE & ENGINEERING FIELDS  
87% INCREASE FROM FY20

**#35** **\$5.9M** AEROSPACE, AERONAUTICAL, & ASTRONAUTICAL ENG.  
10% INCREASE FROM FY20

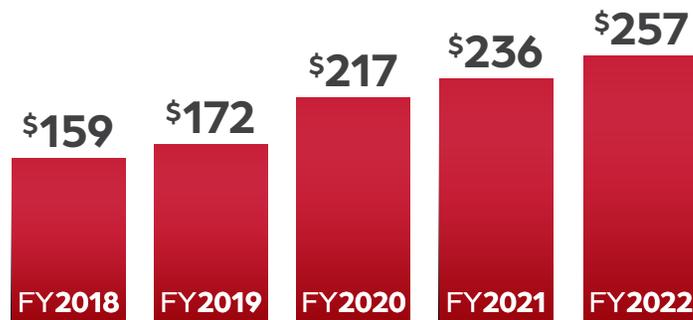
**1,045** FY22 PROPOSALS SUBMITTED  
TOTALING \$709M<sup>1</sup>

Source: National Science Foundation Higher Education Research and Development (HERD) Survey. Data includes HERD FY21 (published) and HERD FY22 (submitted, not published).

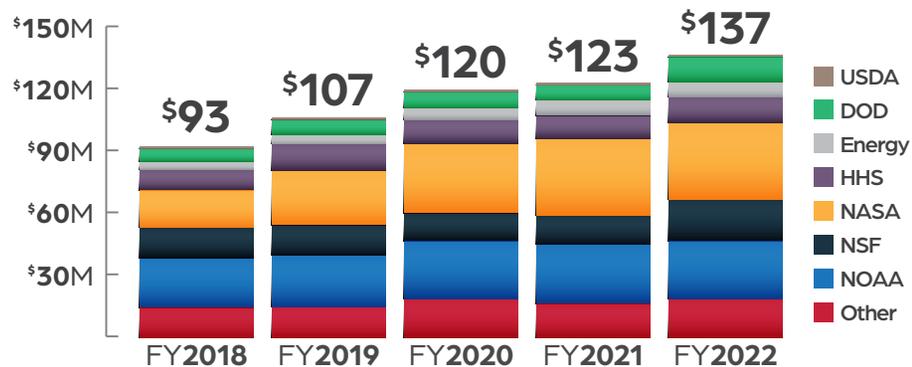
<sup>1</sup> OU research administration system. Does not include Outreach or HEERF.

# Expenditures

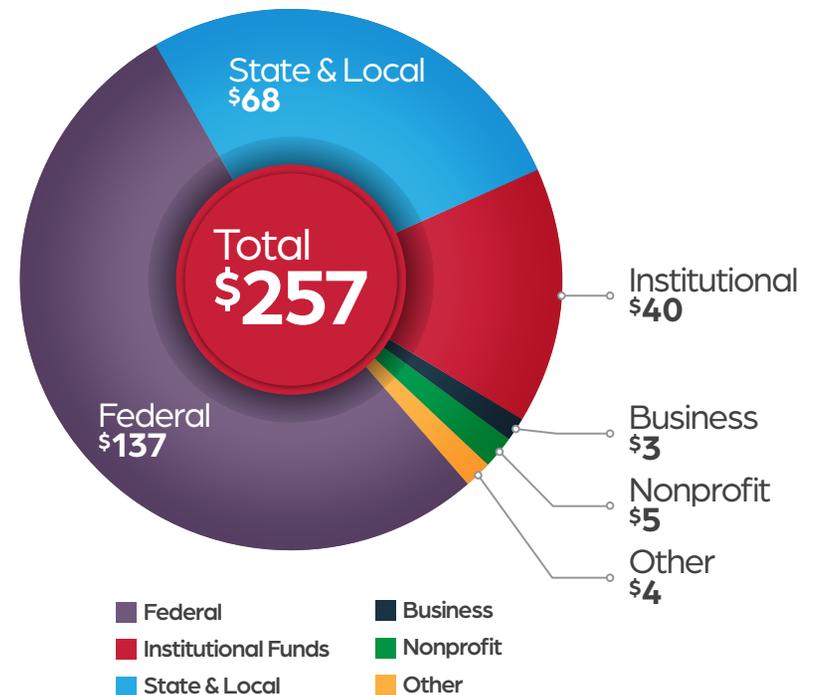
Norman Campus  
Total Research Expenditures



Norman Campus  
Federal Research Expenditures by Sponsor



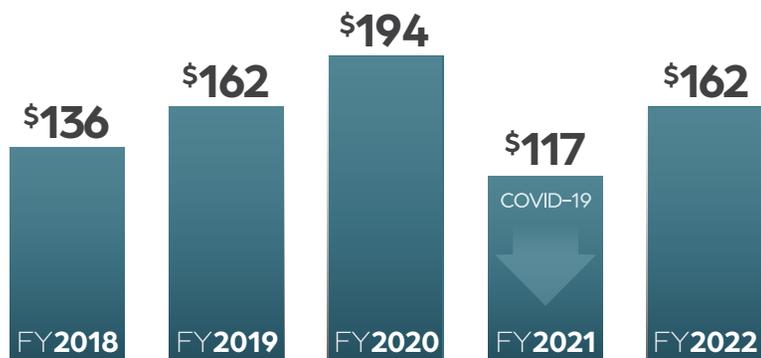
Norman Campus  
FY22 Research Expenditures by Source



Source: NSF HERD; Norman Campus Programs; Amount reported in millions; FY22 HERD as initially reported to NSF.

# Awards

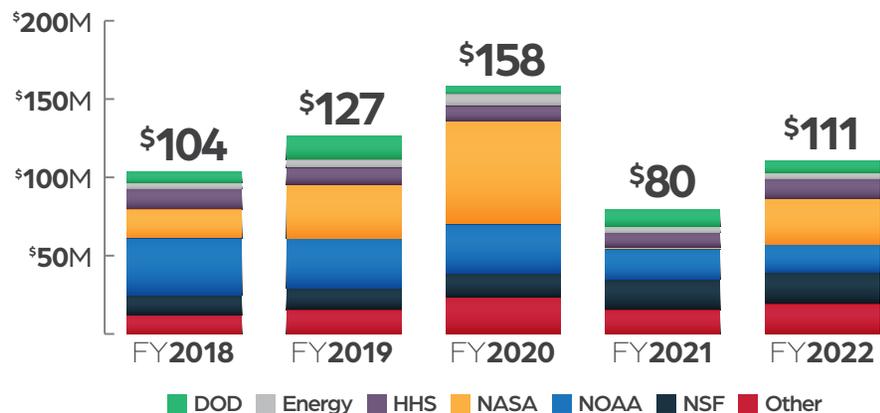
Norman Campus  
Total Awards Received



Norman Campus  
Research Awards by Source FY22



Norman Campus  
Federal Awards by Sponsor



- Federal - \$110,716,466
- Foundation - \$2,739,740
- State of Oklahoma - \$19,911,085
- International - \$1,357,041
- Universities - \$10,764,303
- City/County - \$1,000,000
- Commercial - \$10,546,332
- Various - \$25,000
- Nonprofit - \$4,708,390
- Other States - \$8,000

Source: OU Office of Research Services Cayuse. Does not include Outreach or HEERF.

# UNIVERSITY-WIDE STRATEGIC VERTICALS

# Aerospace, Defense, & Global Security

This transdisciplinary research is uniting the resources of the University of Oklahoma with a unique network of industry and government partners to advance security, liberty, and prosperity for our state, nation, and world. OU's efforts in this strategic research area are coordinated by the Oklahoma Aerospace and Defense Innovation Institute (OADII).

111

Proposals  
Submitted

58

Awards Received  
Totaling More Than **\$26M**

# Strengthening our Collaboration with the Oklahoma City Air Logistics Complex

OU continued to strengthen its Educational Partnership Agreement with the Oklahoma City Air Logistics Complex through the progress of six engineering projects that aim to solve sustainment and modernization challenges for the U.S. Air Force.



# Innovating Supply Chain Risk Management

OU's Oklahoma Aerospace and Defense Innovation Institute and Data Institute for Societal Challenges are working with the 448th Supply Chain Management Wing at Tinker Air Force Base to advance wholesale supply chain risk management analytics.

# Bringing National Defense Experts Together for Inaugural Symposium

National security thought leaders from across the country gathered for a symposium on the University of Oklahoma campus on Oct. 20 to discuss partnership opportunities between the defense industry, government and academia.

The symposium, “Addressing Our Evolving Global Security Challenge: Examining the Role of Universities in Meeting Current and Future National Defense Priorities,” included keynote addresses from:

**Honorable Ellen Lord**, former U.S. Under Secretary of Defense for Acquisition and Sustainment

Retired Air Force Gen. **Herbert “Hawk” Carlisle**, former President and CEO of the National Defense Industrial Association (NDIA)

**Mark Lewis**, Executive Director of the NDIA Emerging Technologies Institute and former U.S. Department of Defense Director of Research and Engineering



# Society & Community Transformation

This transdisciplinary research is delivering trustworthy insights and analysis on the human experience to inform critical decisions facing society. The University of Oklahoma's efforts in this strategic research area are coordinated by the Institute for Community and Society Transformation (ICAST).

199

Proposals  
Submitted

112

Awards Received  
Totaling More Than **\$22M**



## Incentivizing Inclusive Teaching and Learning

OU has joined a consortium of 104 colleges and universities taking part in the Howard Hughes Medical Institute Inclusive Excellence 3 Learning Community initiative that aims to support and incentivize teaching and learning practices that increase student success outcomes, particularly in STEM fields.



## Elevating OU's Faculty Evaluation Process

OU Elevate is funded by a **\$3M** grant from the ADVANCE Program of the National Science Foundation as an Institutional Transformation research project developed by an interdisciplinary team of OU faculty representing several colleges and academic units. The research project will create, test, document, and implement a multistep process to ensure that policies and practices used in evaluating faculty annual performance are aligned with institutional goals.

## Supporting Student Parents

According to estimates by the National Center for Education Statistics, more than one-fifth of all college students are parents. Low-income college students enrolled at OU who are parents of young children will soon have additional support services, including high-quality, campus-based child care, additional financial aid and more, thanks to a nearly **\$3M** four-year research project funded by the U.S. Department of Education.



## Mitigating Homelessness

A cross-disciplinary team of OU researchers are working with the Oklahoma Housing Finance Agency to determine how to best deploy approximately **\$36 million** from the U.S. Department of Housing and Urban Development's HOME-ARP program, an investment that must be allocated to areas of greatest impact to support unhoused and housing-insecure Oklahomans as based on data-driven research findings led by OU.



## Improving Access to Native American Languages

The Sam Noble Oklahoma Museum of Natural History has received a \$345,494 grant from the National Endowment for the Humanities for a three-year project to provide online access to the museum's Native American Languages Collection for the first time. This is the **largest total NEH grant** received by an individual investigator at OU and the second-largest collaborative NEH grant ever awarded to OU.



## Bridging Social Science and Engineering

Supported by a **\$3M** grant from the Nuclear Energy University Program of the U.S. Department of Energy, a research team led by OU's Institute for Public Policy Research and Analysis is developing a new approach to consent-based siting of storage facilities for spent nuclear fuel that brings the questions, concerns and interests of community members to the forefront of the engineering and planning process for future storage sites.

# Energy, Environment, & Sustainability

This transdisciplinary research is increasing community resilience and sustainability, driving the transformation of the U.S. energy sector, reducing greenhouse gas emissions and enabling a net-zero carbon economy by 2050. The University of Oklahoma's efforts in this strategic research area are coordinated by the Institute for Resilient Environmental and Energy Systems (IREES).

424

Proposals  
Submitted

201

Awards Received  
Totaling More Than **\$43M**

# Growing Weather Research at OU

\$20 million in state appropriations, paired with internal investments, will support the expansion of the National Weather Center at the University of Oklahoma. OU is home to the #1 weather program, the #1 aviation program, and the largest university-based academic radar program in the nation. This expansion extends Oklahoma’s leadership in the severe weather space and supports the continued growth of the OU/NOAA Cooperative Institute for Severe and High-Impact Weather Research and Operations (CIWRO).

**55K**

**Square Foot Proposed Addition to the National Weather Center**

**50+**

**Research Scientists Joining CIWRO by FY28**





## Discovering New Ways to Produce Hydrogen

OU is catalyzing innovative research across the hydrogen value chain from production, storage, and distribution to applications in transportation and industrial processes.

The governors of Oklahoma, Louisiana, and Arkansas announced that the three states have entered a bipartisan partnership to establish the HALO Hydrogen Hub, a regional hub for the development, production, distribution, and use of clean hydrogen as fuel and manufacturing feedstock.



## Commercializing Fusion Energy

OU has developed partnerships with Oklahoma-based Tribal Nations, national laboratories, and industry partners to develop new fusion engineering and technology workforce development programs.

## Pioneering Geothermal Energy

OU is pioneering new geothermal energy developments, including transforming retired oil and gas wells into geothermal testbeds, leveraging Oklahoma's longstanding oil and gas expertise.





## Supporting Latin American Sustainability

Just one of a multitude of collaborations coordinated through OU's Latin America Sustainability Initiative of IREES, OU is supporting a \$15M USAID project to establish a PERU-Hub to support agricultural, economic, and social improvement in the San Martin region.

7

MOUs with Universities in Peru

\$6  
MILLION

Extramural Funding

# The Future of Health

This transdisciplinary research is driving fundamental discoveries related to clarifying mechanisms and cellular processes to develop new therapies and technologies to combat and eradicate deadly diseases; monitoring, predicting, and responding to pathogenic threats; and addressing growing health-related disparities. The University of Oklahoma's efforts in this strategic research area are coordinated by the Integrative Life Sciences Institute.

**277**

**Proposals  
Submitted**

**100**

**Awards Received  
Totaling More Than \$17M**



## Preventing the Next Pandemic

OU is the only institution to have two groups of researchers selected to receive nearly **\$1 million** Predictive Intelligence for Pandemic Prevention initiative grants from the National Science Foundation.



## Advancing Proteomics

A five-year highly competitive National Institutes of Health Maximizing Investigators' Research Award supports innovative exploratory research into "top-down proteomics."



## Phase I, Phase III COBRE Funding Awarded

OU received funding for two Centers of Biomedical Research Excellence from the National Institutes of Health in 2022.

The new **Oklahoma Center of Medical Imaging for Translational Cancer Research** received funding for its first phase to galvanize multidisciplinary biomedical research.

The **Oklahoma Center of Biomedical Research Excellence in Structural Biology** received phase three funding to help ensure the continuity of the center in providing structure-based biomedical studies of biological macromolecules.

**\$11.3**  
MILLION

**Medical Imaging  
COBRE Phase I**

**\$5.7**  
MILLION

**Structural Biology  
COBRE Phase III**

# OU Leading Oklahoma Biotech Innovation Cluster

The Oklahoma Biotech Innovation Cluster initiative, a coalition spearheaded by the Greater Oklahoma City Chamber alongside primary coalition partners including OU and OU Health, and with industry leadership and vision from Echo Investment Capital, has been awarded \$35 million through the Build Back Better Regional Challenge of the U.S. Economic Development Administration.



**\$24.9**  
MILLION

**Extramural Funding**

**4**

**OU Projects**





The four OU-led projects of the six-project Oklahoma Biotech Innovation Cluster are:

- » **OU Biotech Core Facility:** a new facility with state-of-the-art high-throughput, advanced bioprocessing equipment and services.
- » **OKBioStart:** supportive programming to build a vibrant regional pipeline to launch and grow biotech startups across Central Oklahoma.
- » **OU Health Stephenson Cancer Center for Therapeutics - Translational Research Labs:** development of ten translational research labs dedicated to drug discovery.
- » **OU Health Stephenson Cancer Center Early Phase Clinical Trial Network:** an initiative to double the size of the existing center's clinical trial program, commensurate with the demand for Phase I trials created through accompanying translational science investments and industry growth.



# CROSS-CUTTING FOUNDATIONAL CAPABILITIES



## Advanced Radar Research Center

The ARRC is the largest academic radar program in the nation and is an innovation leader in radar systems, algorithms, and radio frequency components. In addition to weather applications, the ARRC's all-digital PAR technology has garnered the attention of the Department of Defense resulting in significant growth in that sector.

**\$23**  
MILLION

Extramural Awards



## Data Institute for Societal Challenges

Our world is creating massive amounts of data through cellphones, sensors, videos, automation, and simulation. These data have enormous potential to transform our lives and help in solving our greatest societal challenges. DISC empowers transdisciplinary research and collaboration to drive convergent solutions to societal challenges in Oklahoma, the nation, and the world through data science research, tools, and capabilities.

**\$8**  
MILLION

Extramural Awards



## Center for Quantum Research & Technology

CQRT is committed to making significant advances in the field of quantum science and technology by bringing together faculty, students, and industry partners. CQRT supports research in quantum materials, sensors, and the scientific study of measurement and quantum communications and computing. In collaborating with CQRT, the foundation of an advanced materials center of excellence was developed this year.

**\$2**  
MILLION | Extramural Awards



## Institute for Public Policy Research & Analysis

IPPRA builds partnerships and conducts research by integrating public policy scholarship with the physical and engineering sciences to increase human well-being, improve our social choice infrastructure, and enhance resilience by addressing complex public policy problems and creating opportunities that span natural, technological, and social systems.

**\$7**  
MILLION | Extramural Awards

# Office of Innovation & Corporate Partnerships

The Office of Innovation and Corporate Partnerships at the University of Oklahoma exists to support faculty, students, and staff innovators from any OU location in moving transformative technologies from the lab to the marketplace. Facilitated by a variety of methods that focus on the transfer of technologies via licensing or other means, engaging with industry and business partners in meaningful and productive relationships, and in building access to capital and talent.

## iPath Launches

OICP launched iPath, an ideation program and launch process that helps OU innovators articulate their business proposition and develop a launch plan that combines elements of business planning and capital strategy.



# 15

iPath Graduates

# 35

Disclosures Filed

# SOWING SEEDS

The OVPRP has launched seven research incentive initiatives intended to help faculty expand their research capabilities and interests, recruit and retain more graduate students and postdoctoral research assistants, and even explore new fields of research. Through rigorous peer review, in response to open requests for proposals, these incentive programs have provided more than \$1.7 million to OU faculty since 2020 and have yielded **14:1** return on investment.



## COVID-19 SEED GRANT PROGRAM

Awarded in spring 2020, this internal investment promoted collaboration between researchers on the OU Norman campus with those on the OU Health Sciences Center campus. Ten seed grants totaling \$375,000 were awarded in April 2020 out of 73 total submissions for research projects that concluded in October 2020.

**24.5X**

Overall ROI

**11**

Extramural Awards

**\$8.7**  
MILLION

External Funding (approx.)  
of 22 Proposals Submitted

**8**

Peer-reviewed Journal  
Articles Published

## ≠ INEQUITIES IN RESEARCH

Awarded in summer 2020, this internal investment promoted short-term projects that addressed the issue of inequities in the academic research and creative activity enterprise. Eleven seed grants totaling \$199,000 were awarded in July 2020 for research projects that concluded in Jan. 2021.

**16.6X** Overall ROI

**3** Extramural Awards

**\$3.3** External Funding (approx.)  
MILLION of 8 Proposals Submitted

**1** Peer-reviewed Journal Article Published



## BIG IDEA CHALLENGE

The Big Idea Challenge at OU encourages the formation of transdisciplinary, convergent research teams focused on solving global grand challenges. BIC projects chart new pathways to discoveries, innovations, and social and policy solutions, while training the next generation of future interdisciplinary talent. Five teams were awarded funding in spring 2021.

**15.5X** Overall ROI

**15** Extramural Awards

**\$9.8** External Funding (approx.)  
MILLION of 24 Proposals Submitted

**13** Peer-reviewed Journal Articles Published



## STRATEGIC EQUIPMENT INVESTMENT PROGRAM

Awards from the Strategic Equipment Investment Program support the purchase of equipment that will have significant impact on enhancing OU researchers' capabilities and competitiveness in research and/or creative activities at a national level. The first SEIP call for proposals in summer 2021 led to four awards totaling \$151,577 OU investment out of 21 total submissions. Equipment was received in spring 2022.

**8X** Overall ROI

**2** Extramural Awards

**\$1.2**  
MILLION External Funding (approx.)  
of 9 Proposals Submitted

**2** Peer-reviewed Journal  
Articles Published



## SOCIAL SCIENCES, HUMANITIES, & ARTS SEED GRANT PROGRAM

The Social Sciences, Humanities, and Arts seed grant program aims to enhance research and creative endeavors for faculty in non-STEM fields at OU to develop projects for impactful publication, recognition, and external grant or fellowship programs. Thirteen seed grants totaling \$148,000 were awarded in summer 2021 out of 32 submissions.

**3** Extramural Awards

**\$137**  
THOUSAND External Funding (approx.)  
of 26 Proposals Submitted

**2** Peer-reviewed Journal  
Articles Published

**1+1** Symposium & Traveling  
Exhibition

# New Seed Grant Programs



## **SIGNIFICANT IMPACT RESEARCH GRANT PROGRAM**

Designed to incentivize and support lead principal investigators in their efforts to prepare and submit significant impact, large-scale grant applications to a broad array of extramural funding agencies, the Significant Impact Research Grant program provides funds to cover a teaching release for the lead PI for one course in the semester leading up to a significant grant submission deadline. Four PIs received the one-course teaching buyout during 2022 for a total OU investment of \$39,000.



## **POSTDOC MATCH PROGRAM**

Designed to stimulate and enhance OU research and creative activity efforts through partial support for a postdoctoral researcher position on externally funded grants, the Postdoc Match Program provides 25% of a postdoctoral researcher's salary and fringe benefits for a one-year time period, provided that such a position was budgeted for in an awarded external grant application.

# HONORIFICS

## SIGNIFICANT AWARDS

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**Michael Detamore, Ph.D.**  
Named a National Academy of  
Inventors Fellow



**Horst Hahn, Ph.D.**  
Member of the National  
Academy of Engineering



**Thirumalai Venkatesan,  
Ph.D.**  
Named as a Royal Society  
Fellow and a National Academy  
of Inventors Fellow



**Ann West, Ph.D.**  
Named a Fellow of the  
American Association for the  
Advancement of Science



**Linda T. Zagzebski, Ph.D.**  
Elected to the American  
Academy of Arts and Sciences

# YOUNG INVESTIGATORS AWARDS

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**Julie Allen**

American Public Health Association James G. Zimmer New Investigator Research Award, Finalist



**Dahiana Arcila**

NSF Faculty Early Career Development (CAREER) award



**Yagmur Derin**

International Precipitation Working Group Early Career Scientist Award



**Michele Galizia**

NSF Faculty Early Career Development (CAREER) award



**Siduri Haslerig**

2022 Emerging Scholar, Diverse Issues in Higher Education



**Emily Kuntz**

Early Career Publication Award, Council for Exceptional Children



**Sepideh Razavi**

NSF Faculty Early Career Development (CAREER) award



**Scott Salesky**

NSF Faculty Early Career Development (CAREER) award



**Cori Simon**

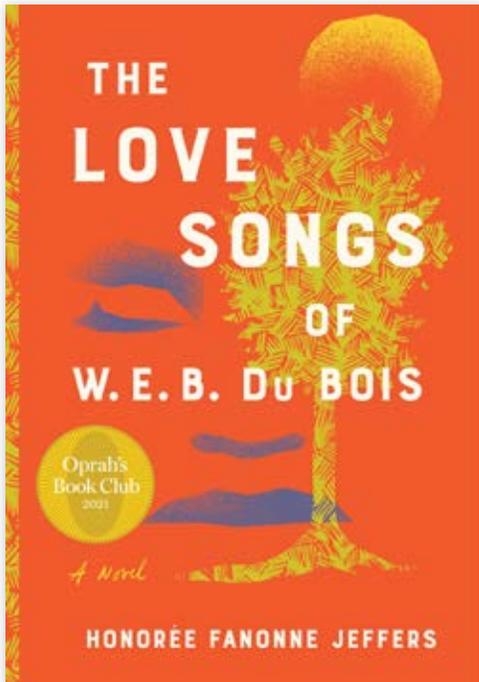
Western History Association Dissertation Prize



**Shreya Vemuganti**

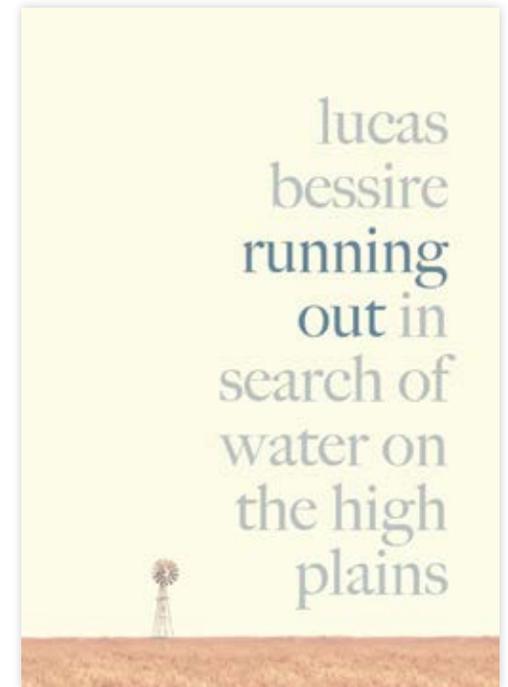
Oak Ridge Associated Universities Ralph E. Powe Junior Faculty Enhancement Award

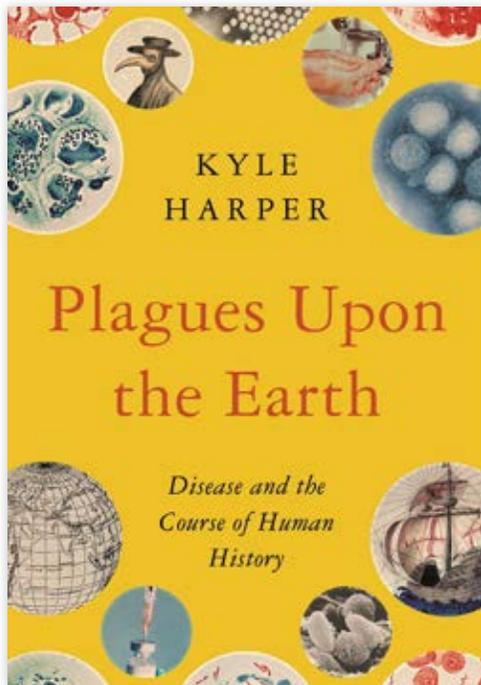
## CRITICALLY ACCLAIMED WORKS BY OU HUMANISTS —



**The Love Songs of W.E.B. Du Bois**, authored by Honorée Fanonne Jeffers, added the 2022 Dayton Literary Peace Prize for fiction to the long list of awards garnered by the book published in 2021. Prior to being selected for the Dayton, *Love Songs* was reviewed designated one of the 10 best books of 2021 by *The New York Times*, was the winner of the National Book Critics Circle Award for Fiction, ranked finalist for a litany of other awards, and was an Oprah Book Club selection.

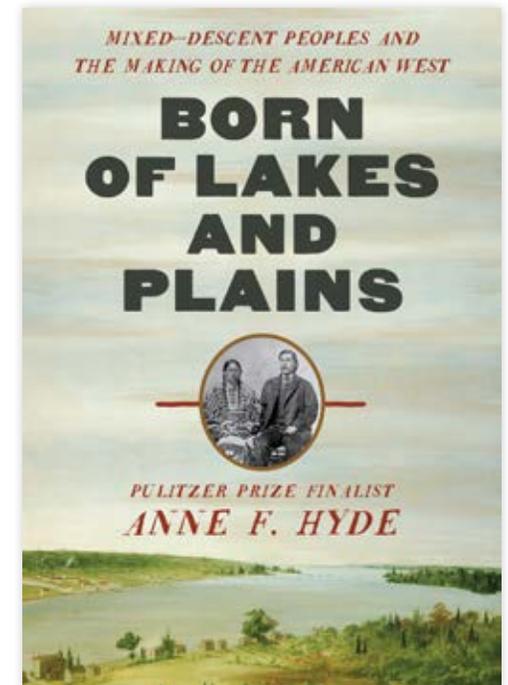
**Running Out: In Search of Water on the High Plains**, authored by Lucas Bessire, won four awards in 2022 including the 2022 George Perkins Marsh Prize, American Society for Environmental History, and was a 2021 finalist for the National Book Award for Nonfiction.





**Plagues Upon the Earth: Disease and the Course of Human History**, authored by Kyle Harper, won the 2022 PROSE award from the Association of American Publishers in the category of the History of Science, Medicine, and Technology. Also in 2022, Harper was named an Andrew Carnegie Fellow and selected to join the prestigious Santa Fe Institute's Fractal Faculty.

**Born of Lakes and Plains: Mixed-Descent Peoples and the Making of the American West**, authored by Anne F. Hyde, published in 2022, was named a *New Yorker* Best Book of 2022 and reviewed in *The New York Times*.





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Learn more at [ou.edu/research](https://ou.edu/research)