



Wichita State

RESEARCH NEWS

April 2020

WICHITA STATE RESEARCH NEWS • April 2020

Welcome to the inaugural edition of the Wichita State University Research Newsletter.

This is the first in a series of newsletters we will disseminate every other month to celebrate the amazing work being advanced at Wichita State University – the only urban public research university in Kansas.

Like most academic institutions in the U.S. and elsewhere, Wichita State University and our community are being profoundly affected by COVID-19 and are trying to prevent its spread.

Most of our research continues remotely in the form of writing projects and data analyses. In addition, there is a minimal presence of researchers on campus to conduct laboratory research associated with government defense contracts, projects with impending deadlines and research related to the COVID-19 virus itself, such as public health initiatives, constructing masks and ventilator components using our additive manufacturing



Coleen Pugh

equipment, understanding the mechanism of corona viruses and developing antimicrobial agents that may have relevance to COVID-19.

Wichita State is on a trajectory to become one of America's great public research universities, known for its innovation and regional impact.

As we seek to diversify and expand our research, it is imperative that a broader segment of our faculty and student body are engaged and provided the necessary support.

I have been asked by WSU President Jay Golden to lead the Office of Research, as well as continue as the dean of the Graduate School. My primary goal is to facilitate diversification of our research to provide long-term benefits for our region and continued financial sustainability for our university.

To that end, Dr. Golden has committed internal funding to support a Convergence Sciences Initiative for building transdisciplinary teams that solve complex societal problems in three areas: health disparities and health delivery, digital transformations, sustainability, as well as a fourth open topic.

A little about me : I spent the past 20 years in the Department of Polymer Science, including as chair of the department for six years, in the College of Polymer Science and Polymer Engineering at The University of Akron. My bachelor's degrees are in chemistry and in textile science from the University of California, Davis, and my master's and Ph.D. degrees are in macromolecular science from Case Western Reserve University.

Following postdoctoral work at MIT and a visiting professorship at Carnegie Mellon University, both in chemistry, I began my independent career as a synthetic polymer chemist at The University of Michigan before joining the polymer efforts at Akron.

I started at Wichita State University in August 2019 and am excited about the Shocker way of pushing boundaries to change the world.

Till next time, stay safe and be healthy!

Coleen Pugh

Associate vice president of research
Wichita State University

Getting to Know Wichita State University

This fall, WSU admitted 1,655 first-year students. Here's a look at our enrollment numbers this academic year.

- **Total Enrollment:** 16,058
- **Undergraduate:** 13,217
- **Graduate and Professional:** 2,469
- **In-State:** 9,399
- **Full-Time:** 11,397



Research Advantage



Research Records

U.S. Department of Defense (DoD) Awards



\$33M

from the U.S. Army
Combat Capabilities
Command Aviation &
Missile Center



\$23.5M

from the U.S. Air
Force Research
Laboratory



\$7M

from the Office of
Naval Research



\$136M

Total in fiscal year
2019, which ended
June 30

Industry Research

The steep rise in contracts and awards from the U.S. Department of Defense (DoD) increased by more than \$40 million from FY18 to FY19.

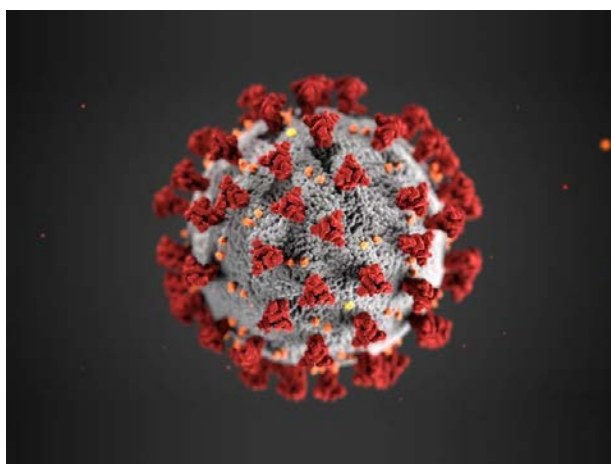
1,016 | Number of Industry-Sponsored Awards

\$33.7M | Amount of Industry-Sponsored Awards

Wichita State chemist working to develop antiviral drugs in fight against COVID-19

Up until recently, COVID-19 (coronavirus disease 2019) may have been a relatively new phenomena to the general public, but Wichita State University medical chemist Bill Groutas, two virologists from Kansas State University, and a physician/virologist from the University of Iowa have been working on a cure for coronaviruses for more than three years.

"It's a big problem, with no vaccines available," said Groutas. "The coronavirus could be around for a long time."



Groutas, along with K-State researchers Yungeong Kim and Kyeong-Ok Chang and Stanley Perlman at the University of Iowa, have been working to develop antiviral drugs to treat Middle East Respiratory Syndrome caused by MERS-CoV. That work extends to other human viruses that are similar to COVID-19.

He says there are currently no antiviral drugs available for coronaviruses, which include SARS-CoV, MERS-CoV and SARS-CoV2. The team has identified compounds that show efficacy against MERS-CoV in mice and are also potent inhibitors of a SARS-CoV2 enzyme that is essential for virus replication.

If their compound works, Groutas said, it can be used in combination with other compounds – Gilead remdesivir polymerase inhibitors – to reduce the impact of the coronavirus.

According to Groutas, some researchers in Israel believe there could be a vaccine for COVID-19 within three months, although in the U.S. it is estimated that it will take a year or more before a vaccine is realistic.



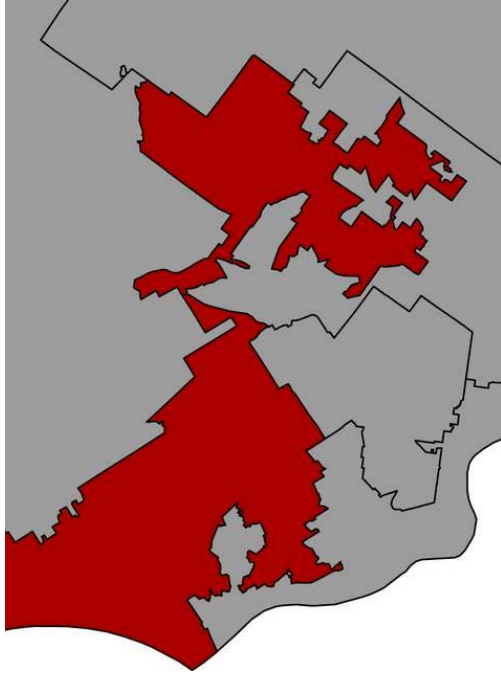
Wichita State University launches biomedical engineering Ph.D. program

Wichita State University is the only Kansas university that offers BS to Ph.D. programs in biomedical engineering.

The program teaches students fundamental understanding of the application of engineering principles and biomedical research with an emphasis on interdisciplinary research.

Members of the Wichita State team include faculty Dr. Anil Mahapuro, Dr. Nils Hakansson, Dr. Yongkuk Lee, Dr. David Long, Dr. Kim Cluff, Dr. Jaydip Desai and Dr. Michael Jorgensen.

[Read the story for more information.](#)



Political Science professor seeks understanding of gerrymandering through research

Brian Amos, assistant professor of political science at Wichita State University, is conducting research on redistricting and gerrymandering.

Amos created an improved computer program that can compile population demographics, including totals, density, income and racial details to create precise voting district maps.

His work is on display at WSU's Ulrich Museum of Art, titled "Solving for X." The exhibit creates a visualization of his research.

[Read the story](#)

Resources and Facilities

Wichita State researchers expand on understanding of hormones in reproductive physiology

Wichita State University researchers are studying large and small follicle-stimulating hormones (FSH) in urine. The FSH enables eggs during reproduction to mature and become capable of fertilization. The goal of the lab is to fundamentally understand how reproductive physiology works.

The research is measuring a modification that alters the size of FSH. Research has shown that when an ovary needs as stronger hormonal stimulation, it receives a weaker



stimulus and eggs fail to mature properly. The measurements are used to find a ratio of the large to small FSH to diagnose the onset of infertility in older women.

Members of the Wichita State team include Dr. George Bousfield, Dr. Jeffrey May, Dr. Viktor Butnev, Dr. Yongchao Li, Dr. Tarak Sharma, Bill White, Vanda Baker, Amy Yonai, Scottie Argyle and Sahithi Katta.

Wichita State chemistry professor researching IMS technology to provide to labs across the country



Alex Shvartsburg, center, with graduate students Pratima Pathak, left, and Francis Arevalo.

Wichita State University Associate Professor of Chemistry, Alex Shvartsburg, is focused on advancing the novel nonlinear IMS technology of differential or field asymmetric waveforms (FAIMS).

His research exams how to develop mass spectrometry techniques that effectively separate, and thereby resolve, molecules with similar and even identical masses, such as D/L peptides, histone tails, lipid isomers and other species topical to proteomic and metabolomic investigations. FAIMS aligns large electric dipoles common to larger biomacromolecules, which allows a new approach to integrative structural biology. The separations are found to depend on the molecular geometry, creating a method to characterize chemical structure.

Shvartsburg's work on FAIMS was supported by NSF, NIH DoE and private industries. He is committed to making frontline FAIMS technology available to the community.

Last year, he received the Presidential Early Career Award for Scientist and Engineers, the highest honor bestowed by the U.S. government. The award recognizes his years of research. Shvartsburg was the first recipient from Wichita State University and only the third recipient from Kansas.

[Read more about Shvartsburg's Early Career Award](#)

Student Applied Learning and Research



Wichita State University graduate students at the Capital Graduate Research Summit.

Undergrad and graduate student days at the capitol allowed students to showcase their research

Wichita State University's undergraduate and graduate students presented exceptional research from multiple disciplines in two recent events at the Kansas State Capitol.

On Feb. 26, nine Wichita State graduate students congregated in Topeka to present at the 17th annual Capitol Graduate Research Summit. The annual summit brings attention to the innovative research conducted by students and emphasizes the public benefits of research.

[Read more about these graduate students' research.](#)

On March 4, there was an Undergraduate Research Day at the Capitol. This year, approximately 40 students from Kansas universities presented about the research they are conducting. Wichita State had five students present on a variety of topics.

Student presenters are selected through a competitive abstract submission process, and projects are chosen based first on the quality of the research then with attention to the range of fields represented overall and relevance of the project to current law makers.

“We know that students engaged in faculty-mentored research and creative activity are better prepared for professional success. We are grateful for the opportunity to showcase the high quality of undergraduate work across Kansas to state legislators and other guests visiting Undergraduate Research Day at the Capitol,” said Kimberly Engber, Dean of the Dorothy and Bill Cohen Honors College, who, along with the WSU campus coordinator, Erin LeBegue, traveled with the students to Topeka.

[Read more about these undergraduate students' research.](#)

Congratulations to the Wichita State University students who were selected to present!



Undergraduate students at Wichita State participated in the Undergraduate Research Day at the Capitol.

Wichita State political science majors help with research on ranked-choice voting



Wichita State senior Alejandro Arias Esparza interned at FairVote last spring in Washington, D.C.

The Wichita State Political Science Department recently received a \$5,500 external grant from FairVote, a nonpartisan organization that advocates electoral reform in the United States.

The grant supports a voter education project revolving around ranked-choice voting. Ranked-choice voting allows voters to rank candidates on their ballot in order of choice to better reflect the majority voters.

The organization is based in Washington, D.C. and does non-partisan advocacy for voting reform. Most of the grant will pay students to conduct Ranked-choice voting mock elections in classes and student group meetings at WSU, as well as courses at partnering Kansas community colleges and community groups.

Neal Allen, associate professor and project director, is recruiting 12 students, including a team of Spanish-speaking students to present in Southwest Kansas. The work with FairVote would not be possible without the relationship built with FairVote and the D.C. interns.

[Read more about FairVote.](#)

In the News

Convergence Initiative emerges as way to fund research clusters at Wichita State University

Wichita State's Convergence Sciences Initiative empowers faculty, staff and students who span the disciplines to form research clusters. The initiative offers more than \$1 million in research awards.

The focus is on research that addresses societal problems in health disparities and health delivery, digital transformation and sustainability.

[Visit the website for information](#)



Wichita State licenses wind turbine protection tech



Wichita State University and WSU Ventures have partnered with a Lightning Diversion Systems (LDS) a Ducommun Company, for the exclusive licensing of a lightning strike protection system for rotor blades in the wind turbine industry.

The agreement will enable a new technology in the growing wind energy sector, to be further refined, with the intent of

commercialization.

[Read the story here](#)

Professors, students recognized for innovative research

Three Wichita State University researchers and a student group have been awarded the John A. See Innovation Award.

The faculty winners are Anil Mahapatro, Eylem Asmatulu and David Long.

Mahapatro, associate professor of biomedical engineering, won for his research project, "Plant based materials for Stereolithography 3D printers."

Asmatulu is an assistant professor the department of mechanical engineering. She is collaborating with Long in biomedical engineering, and their winning research project is titled "Superhydrophilic nanofiber desiccants for enhanced food and drug packaging."

Students were also recognized for their venture-based projects. Jared Goering, Spencer Steinert and Max Hinman from innovation design won for their project titled "nwire – immersive learning platform."

The John A. See Awards began in 2014 after See donated \$1 million to provide prizes to WSU faculty and students conducting outstanding research or producing other significant work.

See was director of flight test and prototype development at Boeing until his retirement in 1985. Although not a Wichita State alumnus, he has been a generous WSU supporter who values the importance of higher education and believes in WSU's commitment to growth and pioneering work.



Our Research **Innovation Team**

Let us help build your future

Have questions about what Wichita State can do for your business?

Need access to student interns or workforce development assistance?

Reach out to our Research Innovation Team to find out how Wichita State can work with you to advance your business and serve the applied learning mission of the university.



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Associate Vice
President of Research



[Jeremy Patterson](#)
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Innovation and New Ventures



[Tonya Witherspoon](#)
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