NEWS
ENGINEERING RESEARCH ADMINISTRATION
AUBURN UNIVERSITY
Samuel Ginn College of Engineering

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Announcements

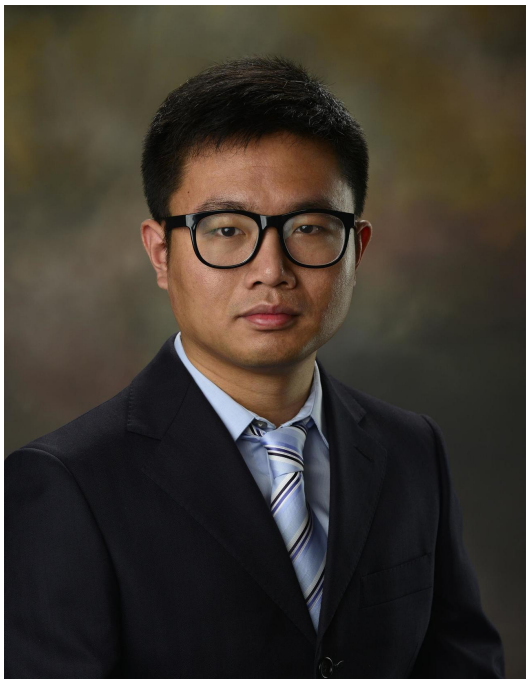
Faculty Colloquium Today

Date: Wednesday, April 10, 2024
Time: 12:00-1:00 pm
Location: Brown-Kopel | 3rd Floor Grand Hall

Please join the Faculty Colloquium today at noon. Today's program includes informational research discussions with lunch, followed by presentations from faculty members Pan He and Virginia Davis.

Faculty Research Spotlight

Dr. Siyuan Dai



Today's faculty research spotlight features Dr. Siyuan Dai, Assistant Professor and Ginn Faculty

Achievement Fellow in Mechanical Engineering. Dr. Dai's broad research interests include nano-optics, super-resolution imaging, and quantum materials.

Dai was drawn to this research area by the knowledge gap in isotope spatial heterogeneity. "Element isotopes exist everywhere," Dai says, "and are crucial material parameters governing a variety of electric, thermal, magnetic, and quantum responses." However, Dai notes, because isotopes are always homogenously distributed in space, he sees opportunities in his research to "tune material properties by spatially repositioning and engineering various isotopes."

Occupying this niche, Dai's research has led him to a recent publication: "Van der Waals isotope heterostructures for engineering phonon polariton dispersions." This work introduces a new materials engineering method by strategically positioning various isotopes to engineer material properties. In this study, the new materials engineering method was showcased in nanoscale light-matter waves to reveal innovative propagation characteristics and energy-momentum dispersions.

With this publication, Dai aimed to fill the knowledge gap of isotope spatial heterogeneity by strategically positioning various isotopes in isotope heterostructures to tailor material properties with the unprecedentedly spatially engineered atomic masses and nuclear spins of various elements.

In the future, Dai plans to study thermal properties and quantum information and communication by isotope heterostructuring. He looks forward to future collaboration with scholars involved with quantum information science and technology and with materials theory and simulation.

Chen, Y. Zhong, E. Harris, J. Li, Z. Zheng, H. Chen, J.-S. Wu, P. Jarillo-Herrero, Q. Ma, J. H. Edgar, X. Lin & **S. Dai** (2023). Van der Waals isotope heterostructures for engineering phonon polariton dispersions. *Nature Communications*, 14, 4782.

Funding Opportunities

Development and Deployment of Innovative Technologies for Concrete Pavements

Federal Highway Administration
Due May 20, 2024
Areas of interest: transportation technologies, infrastructure systems, sustainable construction

This call aims to stimulate, facilitate, and expedite the deployment and rapid adoption of new and innovative technologies relating to the design, specification, production, testing, control, construction, investigation, operation, and impacts of concrete pavements. It will also support public agencies by helping to increase the knowledge related to concrete pavements and concrete materials.

Products will include, but not be limited to, implementation plans, market analyses, training tools, case studies, reports and analyses, and supporting stakeholder engagement via conference presentations, webinars, workshops, peer exchanges, videos, and technical assistance to public agencies.

Read more about the solicitation here.

Advancing Sustainable Chemistry

Environmental Protection Agency
Due May 29, 2024
Areas of interest: chemical engineering

The Science to Achieve Results (STAR) Program's goal is to stimulate and support scientific and engineering research that advances EPA's mission to protect human health and the environment. This

call is soliciting research for data, methods, and systems that lead to actionable, scalable change toward chemistry, chemicals, and products that support sustainable chemistry.

Sustainable chemistry produces compounds or materials with intentional design, manufacture, use, and end-of-life management. Across their lifecycle, sustainable chemicals promote circularity, meet societal needs, and contribute to economic resilience. The introduction of more sustainable chemical products, processes, and technologies are needed to address emerging and growing challenges and opportunities for the economy, climate action, and environmental justice.

Read more about this opportunity here.
