



VOICES
OF

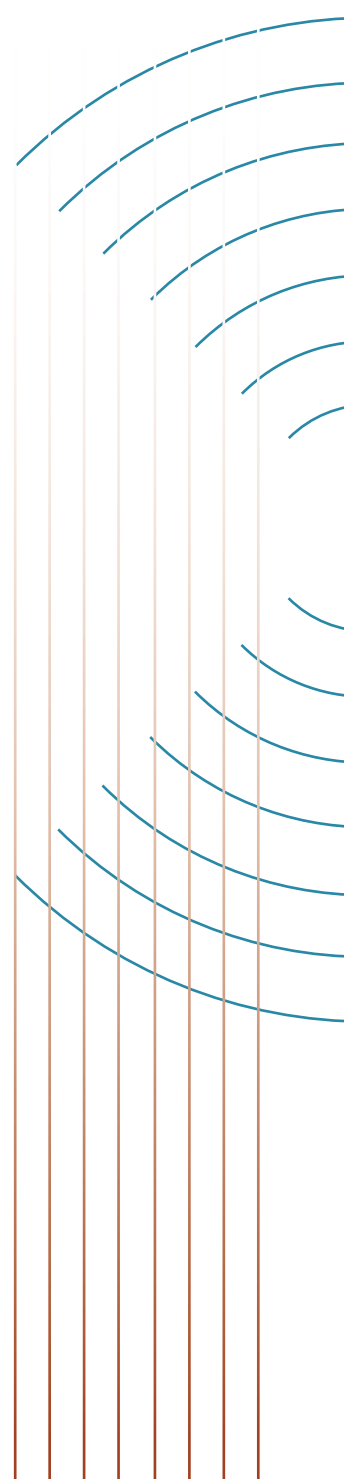
DISCOVERY

2024-25

Elon College, the College of Arts and Sciences at Elon University is committed to engaging students and the community in the excitement and wonder of discovery. During the past two decades, scores of discoveries in molecular biology, atomic physics and computer technology have changed the face of science and brought dramatic changes to our world.

The Voices of Discovery speaker series brings to campus preeminent scientists and mathematicians who have left an indelible mark on the way we view the world. They share their remarkable experiences and perspectives with Elon students and the community. This series plays a fundamental role in the university's commitment to create a science-conscious community and to help students be informed citizens.

Voices of Discovery is just one element of Elon's efforts to provide outstanding science education. Students work in modern laboratories with cutting-edge research tools at the Dalton L. McMichael Sr. Science Center, which is undergoing renovations to enhance facilities for biology, chemistry and environmental sciences. In fall 2022 engineering and physics moved to the new Innovation Quad, which is located adjacent to McMichael Science Center. Two of the buildings, Founders Hall and Innovation Hall, support teaching, project design and development; research in physics and engineering; and cross-disciplinary projects within the natural sciences as well as interdisciplinary projects connecting STEM with other academic areas.





REIMAGINING DRUG DISCOVERY AND MANUFACTURING: ENGINEERING A PATH TOWARDS AFFORDABILITY

Tayo Sanders, Ph.D.

B.S. Materials Science, University of Wisconsin-Eau Claire; Ph.D. Engineering Science and Rhodes Scholar, University of Oxford. Co-founder of Arrowpoint Labs and consultant with the Venture Studio at Southern Research.

Monday, Sept. 9, 2024
McCrary Theatre | 7 p.m.

News of promising new pharmaceutical therapies is often offset by information about staggering costs for consumers. Such costs originate in the research landscape, where pharmaceutical companies pursue the development of new drugs. Imagine investing a sum that could purchase a professional sports team, only to have your investment fail 90% of the time. Over the past two decades, the average cost to bring a new drug to market has skyrocketed from approximately \$800 million to a staggering \$2.6 billion, according to an article in the Journal of Health Economics. The price of life-saving medications continues to soar, raising ethical concerns and challenges for both patients and health care providers.

Reducing the costs of discovering and manufacturing life-saving therapeutics is critical for human health. Tayo Sanders II supports the development of such technologies from venture-backed startup companies. He co-founded Arrowpoint Labs to work with universities, research institutes, economic developers and precision health leaders to source

technologies, develop innovation strategies and advance implementation of precision medicine tools. Sanders will share the journeys of two technologies that are being developed by companies he consults with on science and strategy: cell-free RNA and protein manufacturing and high throughput, high dimensional live cell imaging. The narratives will highlight their respective scientific challenges and potential for reducing costs.

Sanders is a scientist, investor, and founder with a passion for achieving positive outcomes for people in the complex landscape of drug development and delivery. He was previously the director of the Venture Studio at Southern Research, where he supported development of companies engaged in therapies related to oncology, pain, addiction and neurodegenerative disease, and he is strategic advisor to Birmingham, Alabama's Biden-Harris Tech Hub. As co-founder of Arrowpoint Labs, he is supporting the growth of regional innovation hubs across the United States.

THE PROMISES AND PERILS OF AI

Mary (Missy) Cummings, Ph.D.

B.S. Mathematics, U.S. Naval Academy; M.S. Space Systems Engineering, the Naval Postgraduate School; and Ph.D. Systems Engineering, the University of Virginia. Professor in George Mason University College of Engineering and Computing and director of George Mason's Autonomy and Robotics Center (MARC).

Monday, Nov. 11, 2024
Lakeside Meeting Rooms | 3 p.m.



While artificial intelligence (AI) is seemingly everywhere, the reality that such systems may not actually be as capable as envisioned is slowly creeping into the national consciousness. While AI can show up in many everyday applications from shopping to management of home automation, it is the application of AI in safety-critical systems like transportation and medicine that is the most concerning since the incorrect use of AI can have deadly consequences. The arrival of error-prone large language models has only further complicated the AI debate. Mary (Missy) Cummings is very up-front about the strengths and weaknesses of AI and in making recommendations for human-AI collaborative systems as well as paths forward to mitigate the impact of AI misapplications and better inform future uses.

This past spring, the official opening of the Mason Autonomy and Robotics Center (MARC) at

George Mason University revealed a large two-story aviary space for testing drones in addition to spaces for teaching, learning, building and working with campus and corporate partners. Cummings directs the Mason Responsible AI program as well as the MARC, whose programs focus on autonomy, robotics and responsible AI. Her research specialty is using AI in robots. She and co-director Jesse Kirkpatrick are quick to emphasize the importance of teaching and modeling responsible AI or "getting it right" to enhance the efficiency, accuracy and safety of autonomous systems and robots.

Cummings is a former naval officer and military pilot and was one of the U.S. Navy's first female fighter pilots. She is also an American Institute of Aeronautics and Astronautics and a Royal Aeronautical Society Fellow. She recently served as the senior safety advisor to the National Highway Traffic Safety Administration.



WATER SECURITY: MAKING SENSE OF GLOBAL TRENDS IN WATER AVAILABILITY AND WATER USE

Kate Brauman, Ph.D.

B.A. Independent Major in Science and Religion, Columbia University; Ph.D. Emmett Interdisciplinary Program in Environment and Resources, Stanford University. Deputy Director of the Global Water Security Center, University of Alabama.

Monday, March 10, 2025
McCrary Theatre | 7 p.m.

Water security is making a big splash these days, with stories both local and global featuring concerns about scarcity, flooding, sanitation and pollution. After all, “water is life,” and access to sufficient clean water impacts all facets of life, including agriculture, health, transport, energy, economics, biodiversity and essential ecosystem services. This in turn impacts geo-political security, with decreased water security destabilizing social structures. Changing climate is already impacting water security and exacerbating water-related threats to human well-being.

Access to current, reliable information and data about climate and water access is critical for decision makers. The Global Water Security Center (GWSC), established at the University of Alabama in 2021, functions to bridge the gap between environmental research and policy development and implementation. GWSC supports government offices, NGOs and industry, answering questions that range from the impact of El Niño–Southern Oscillation on seasonal rainfall feeding the Panama Canal to whether drought in Kenya could lead to conflict between herders and farmers.

Kate Brauman is the deputy director of the Global Water Security Center at the University of Alabama. Her research has included the assessment of global trends in water use and best practices for managing watershed ecosystem services. Prior to her leadership role at GWSC, Brauman served as the lead scientist of the Global Water Initiative at the University of Minnesota’s Institute on the Environment, using an interdisciplinary approach to assess connections between land use and water resources and communicating findings for decision makers. Brauman served as a Water and Climate Resilience Fellow at the U.S. Department of Defense through an American Association for the Advancement of Science (AAAS) Science & Technology Policy Fellowship, where she worked on water resilience at military installations. Brauman was also a coordinating lead author for the 2019 Global Assessment of the Intergovernmental Platform on Biodiversity and Ecosystem Services and a section lead for the 2021 United Nations Environmental Program Global Synthesis Report “Making Peace with Nature.”