

VOICES OF 2019-20 DISCOVERY

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. At the Dalton L. McMichael Sr. Science Center, students work in modern laboratories with cutting-edge research tools. They focus on discovery-based learning, undergraduate research and collaboration among the sciences, developing an appreciation for the scientific enterprise and how we acquire new knowledge.



ARE YOU ON THE PILL?

Developing Prevention Strategies for HIV Infection



Tuesday, **September 17, 2019** | McCrary Theatre | 7:00 p.m.

Angela Kashuba, *BSc.Pharm., Pharm.D., DABCP, FCP*

The John A. and Deborah S. McNeill Jr. Distinguished Professor in the University of North Carolina at Chapel Hill's Eshelman School of Pharmacy

Director of the UNC Center for AIDS Research, Clinical Pharmacology and Analytical Chemistry Core

Fellow of the American College of Clinical Pharmacology

Historically, preventive approaches to HIV infection have focused on abstinence, limiting sexual partners, the use of condoms and eliminating needle sharing. Despite these approaches, more than 36.9 million people are currently living with HIV. Approximately 1.8 million new cases were diagnosed in 2017. This indicates that new strategies for prevention must be developed. One strategy is pre-exposure prophylaxis (PrEP) drugs that can prevent infection when taken before exposure. PrEP has the potential to reduce infection in high risk populations.

Angela Kashuba, the John A. and Deborah S. McNeill Jr. Distinguished Professor in the University of North Carolina at Chapel Hill's Eshelman School of Pharmacy, believes that antiretrovirals are the most rational

approach for preventing HIV infection. Kashuba's multidisciplinary research team focuses on optimizing the pharmacological benefits of antiretroviral drugs. Her laboratory engages in clinical studies as well as basic research to develop new techniques to measure the effectiveness of HIV prevention or treatment.

Kashuba is also an adjunct professor of medicine in the Division of Infectious Diseases in the UNC School of Medicine and will be the next dean of the Eshelman School of Pharmacy. Kashuba's work has been funded by the National Institutes of Health and pharmaceutical companies including Pfizer, Gilead and Merck. She is frequently an invited speaker at the NIH and the World Health Organization.

URBAN FUTURES:

Transforming Cities for Resilience and Sustainability



Monday, November 4, 2019 | McKinnon Hall | 7:00 p.m.

Timon McPhearson

Associate Professor of Urban Ecology, The New School, New York

Director of the Urban Systems Lab and research faculty at the Tishman Environment and Design Center, The New School, New York

Urban ecology is a relatively young but rapidly advancing and significant field of study that seeks to better understand the interactions of organisms, including humans, in environments that have been designed by people, for people, or are directly impacted by human-centric environments. While precise definition of the term “urban” varies, there is general agreement that human-created environments ultimately operate by the same ecological principles and processes as natural environments. These rapidly expanding environments impact human health and well-being as well as general biodiversity and overall environmental health, and are increasingly susceptible to impacts of changing factors such as climate change.

Timon McPhearson teaches, researches and engages communities through an interdisciplinary lens that focuses on understanding and ultimately improving the social equity, sustainability and resilience of urban

environments. His scholarship addresses the interconnectedness of social, technological and ecological systems in urban environments, social and ecological vulnerabilities and impacts of climate change, and nature-based solutions to enhance resilience of urban environments.

McPhearson leads the climate change and urban resilience work at the Urban Systems Lab funded by the National Science Foundation, Kresge Foundation and the City of New York. He is the lead author for the Intergovernmental Panel on Climate Change (IPCC) sixth assessment report on adaptation in human settlements. McPhearson has also written for several books including “Sustainability in America’s Cities” and “Urban Planet,” and helped develop a virtual magazine and sharing platform called The Nature of Cities. McPhearson was awarded both the Sustainability Science Award and the Innovation in Sustainability Science Award by the Ecological Society of America in 2019.

TRANSFORMING THE HEALTH of Communities through Innovations in Social Computing



Monday, March 9, 2020 | McCrary Theatre | 7:00 p.m.

Andrea Grimes Parker

Assistant Professor, Khoury College of Computer Science and the Bouve College of Health Sciences, Northeastern University

Founder and Director of the Wellness Technology Lab, Northeastern University

Faculty Scholar, Institute for Health Equity and Social Justice Research, Northeastern University

According to a 2016 Pew Research Center study, “about half of Americans think that technology has had a mostly positive effect on society, especially from easy access and speed of information.” Many would argue that with rapidly evolving systems, such as technology, time is needed to fully understand positive and negative impacts on human wellness and to leverage those systems to promote the benefits.

Andrea Parker’s work in this new frontier of rapidly developing technologies focuses on designing and evaluating the impact of software tools that help people move toward improved health and wellness. Her interdisciplinary research happens at the intersection of the emerging technology fields of human-computer interaction, social computing and personal health informatics. She uses

techniques and empirical methods from these fields to address public health challenges, including racial and socio-economic health disparities.

Specific projects from Parker’s lab have included designing and evaluating the use of mobile health interventions to reduce health disparities in vulnerable populations; studying the effectiveness of current social networking systems in addressing health disparities; developing and assessing technology support systems for caregivers; and creating mobile, family-based games to promote physical activity. Parker’s research has been supported by the National Institutes of Health, the National Science Foundation and the Aetna Foundation. She was a recipient of a Microsoft Graduate Research Fellowship for the social impact of her research.

HARNESSING BIG DATA to Optimize Human Movement and Health



Monday, April 6, 2020 | McCrary Theatre | 7:00 p.m.

Scott L. Delp

James H. Clark Professor of Bioengineering and Mechanical Engineering,
Stanford University

Director, National Center for Stimulation in Rehabilitation Research

Director, NIH Mobilize Center

A recent report by the Arthritis Foundation estimates the prevalence of all forms of arthritis in the U.S. may be as high as 1 in 3 people between the ages of 18 and 64 and is currently the leading cause of disability among U.S. adults. Arthritis-induced pain and reduced mobility are thought to be correlated with many serious health impacts including obesity, depression, reduced earning capacity and increased medical costs for treatments. The annual human and economic burden of arthritis in the U.S. is estimated to be over \$300 billion.

Scott Delp would say that there is some good news. There is a virtual treasure trove of functional and dysfunctional movement data available today from a variety of sources, and especially from the fashionable wearable devices that many people are sporting. Delp also believes the analysis of this

big data about movement will lead to a much deeper understanding of dysfunctional movement that is needed in order to optimize treatments and prevent limited mobility regardless of the cause.

Delp is the principle investigator in the Neuromuscular Biomechanics Lab of Stanford University's School of Engineering and Medicine. The lab's multidisciplinary team investigates the dynamics of movement, open source software tools such as OpenSim for sharing movement models and simulations, and big data analysis based on wearable sensors to better understand, treat and prevent dysfunctional movement.

Delp is also a fellow of the American Society of Biomechanics. He has been recognized with the Giovanni Borelli Award for outstanding career accomplishment and is a co-founder of several biomedical technology companies.