#### Voices of Discovery

### ELON

Voices of Discovery 2008-2009

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HEALTH MATTERS.... FROM THE A'S TO THE ZZZZZZZ'S 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.

V oices of Discovery is just one element of Elon's program to provide outstanding science education. At the state-of-the-art **Dalton L. McMichael Sr. Scien Center**, equipped with modern laboratories and cutting-edge research tools, students focus on discovery-based learning, undergraduate research and collaboration among the sciences. They develop an appreciation for the scientific enterprise and how we acquire new knowledge.





#### OUR ENERGY FUTURE – TRADE-OFFS AND CHOICES

#### Tuesday, September 9, 2008

McCrary Theatre 7:30 p.m.

Ellen T. Ruff, J.D.

President, Duke Energy Carolinas

C oncerns about global warming have many Americans focused on energy consumption as never before. Yet rising temperatures have not stopped the U.S. from being the most energy-hungry nation in the world. Comprising about 5 percent of the global population, Americans account for approximately 25 percent of global energy use, with the predominant sources being fossil fuels.

In early June, representatives from the U.S. and several other countries met in Japan to discuss rising energy prices and long-term solutions for access to energy while also addressing the equally pressing need to curb harmful emissions. Closer to home, Duke Energy Carolinas must tackle these same global issues on a local level.

Led by President Ellen Ruff, Duke Energy Carolinas serves more than 2.3 million people in North and South Carolina, providing energy primarily through a combination of nuclear power plants, coal-burning plants and hydroelectric stations. The company recently began an initiative to promote the development of renewable energy sources, addressing the need for a long-term solution to the energy problem. Ruff says she sees the energy picture as a big puzzle with challenging pieces such as having appropriate federal, state and regional policies, and trying to make energy adequate, affordable, renewable, clean and efficient. Referring to this complex puzzle, Ruff said, "The entire picture created by each puzzle piece is the most important."

Ruff joined Duke Power's legal department in 1978 as an attorney, and held several administrative positions in the company before becoming president of Duke Energy Carolinas in 2006. She serves on the executive committee of the North Carolina Citizens for Business and Industry's board of directors and was appointed by Gov. Mike Easley in 2006 to a three-year term on the North Carolina Economic Development board.

#### SCIENCE is FUN!

#### Monday, October 6, 2008

Whitley Auditorium 7:30 p.m.

#### Dr. Bassam Z. Shakhashiri

Professor of Chemistry, University of Wisconsin-Madison William T. Evjue Distinguished Chair for the Wisconsin Idea

n a nation increasingly influenced by science and technology, public knowledge about both topics remains weak. Consequently, many scientists are taking personal responsibility for promoting science literacy by making science more accessible and sharing the joy of discovery with the public. Dr. Bassam Z. Shakhashiri, professor of chemistry at the University of Wisconsin-Madison, is at the forefront of this movement. He contends that individuals must understand science in order to make informed choices - and they can have fun in the process.

Described as a "fierce advocate for science education," Dr. Shakhashiri is renowned for using creative, dynamic teaching methods to communicate the importance of science to the public. He has given more than 1,100 public presentations, most of which involve lively demonstrations of scientific principles, and he frequently spreads his message on radio and television. He is best known for his annual production, "Once Upon a Christmas Cheery in the Lab of Shakhashiri," a lecture that features explosions, dramatic color changes and other chemical "magic."

In addition to his work in the classroom, Dr. Shakhashiri is the founder of the Institute for Chemical Education and the Initiative for Science Literacy at the University of Wisconsin. He served as the National Science Foundation's assistant director for science and engineering education from 1984 until 1990, and he published a popular multi-volume collection of teaching materials called *Chemical Demonstrations: A Handbook for Teachers of Chemistry.* 

A consultant for government agencies, industries and private foundations, Dr. Shakhashiri has received more than 35 awards for his contributions to science education, including the prestigious 2007 National Science Board Public Service Award by the National Science Foundation, Said Dr. Shakhashiri, "Science literacy enlightens and enables people to make informed choices, to be skeptical, to reject shame, quackery and unproven conjecture. Science literacy is for everyone - chemists, artists, humanists, all professionals, the general public, youth and adults alike."



Leader, Technology Partnerships, Rohm and Haas Company

S ince the early 1970s, Congress has passed more than 100 environmental laws. Many addressed pollution in some way, but none offered a long-term solution to the problem. A new paradigm emerged in 1990 with the passage of the Pollution Prevention Act, which focuses on using materials and processes that prevent or reduce pollution. Out of this model, the concept of green chemistry emerged.

Green, or sustainable, chemistry is the design of chemical products and processes that reduce or eliminate the use or production of hazardous substances. The approach is flourishing in industry and academics, with organizations such as the American Chemical Society (ACS) leading the way in designing safer chemicals to reduce harm to the environment. The journal Green Chemistry is devoted to the topic, as is the ACS' Green Chemistry Institute. In addition, the Presidential Green Chemistry Challenge Award recognizes exceptional achievements in green chemistry and green technology.

Catherine Hunt, immediate past president of the ACS, is a strong, successful advocate of sustainable chemistry. Currently, she serves as the

#### SUSTAINABLE CHEMISTRIES: ENVIRONMENTALLY ADVANCED AND ECONOMICALLY VIABLE!

#### Monday, November 10, 2008

McCrary Theatre 7:30 p.m.

#### Catherine Turner Hunt, Ph.D.

#### Immediate Past President, American Chemical Society

leader for technology partnerships at Rohm and Haas Co., where she works to establish collaborations among governmental agencies, industry and academia that can accelerate innovations and emphasize sustainable chemistry. She also continues to build partnerships through her many leadership roles within the ACS, and she enthusiastically promotes "the critical role that chemists and chemical engineers will play in addressing the sustainability of energy, food and water."

Dr. Hunt earned a doctoral degree in chemistry from the University of California, Davis, and spent several years as a research scientist before joining Rohm and Haas Co. A Fellow of the American Association for the Advancement of Science and an organizing member of the Vision 2020 Nanotechnology Roadmap, she serves on the board of directors of the Alliance for Science and Technology Research in America. She has received many professional awards and honors, including being selected as one of only 25 women scientists to participate in the People to People Ambassador Program's Women in Science Delegation.

#### THE IMPACT OF CLIMATE CHANGE ON CORAL REEFS

#### Wednesday, February 18, 2009

McCrary Theatre 7:30 p.m.

#### Dr. Nancy Knowlton



Sant Chair for Marine Science, Smithsonian Institution Director, Center for Marine Biodiversity and Conservation Professor of Marine Biology, Scripps Institution of Oceanography

• oral reefs are the rainforests of the J oceans. They are home to an estimated 25 percent of marine life despite comprising less than 1 percent of the ocean floor. They are sources of beauty, food, medicine, income and coastline protection - and they are under siege. Experts estimate that 25 percent of this ecosystem has been lost in recent years due to threats such as coastal development, ocean pollution, overfishing and tourism. But the most critical challenge to this ecosystem is posed by climate change. Even slight increases in ocean temperatures have long-lasting, catastrophic effects on coral animals.

Nancy Knowlton, professor of marine biology at the Scripps Institution of Oceanography, has devoted her professional career to the study of coral reefs. Her research focuses on the ecology, evolution and conservation of coral reef organisms, and she recently began examining the impact of climate change on the coral reef ecosystem. Knowlton is also the founding director of the Scripps Institution's Center for Marine Biodiversity and Conservation, which provides an interdisciplinary approach to meeting the challenges of marine conservation through basic research, education and collaboration with policy makers.

In addition to her work with the Scripps Institution, Knowlton chairs the Coral Reef Targeted Research Program (CRTR), a partnership between the Global Environment Facility, the World Bank, the University of Queensland, the United States Oceanic and Atmospheric Administration and other research institutions worldwide. The CRTR functions as a global network that provides and coordinates scientific research and integrates scientific knowledge with local policy and management systems in countries and regions most affected by reef decline.

Knowlton also holds the Sant Chair in Marine Science at the Smithsonian's National Museum of Natural History and serves on the National Geographic Society's Committee on Research and Exploration and Conservation Trust Committee.

#### THE AGING BRAIN AND MIND-USE IT OR LOSE IT!

#### Monday, March 2, 2009

McCrary Theatre 7:30 p.m.

Dr. Arthur Kramer

Professor of Psychology and Swanlund Chair, University of Illinois, Urbana-Champaign

A s the large baby boomer generation ages, many researchers have begun focusing on preventative and restorative medical intervention for the aging brain. It is well established that elderly people's brains exhibit declining cognitive functions, memory, speed and neuroplasticity, or the ability to change and adapt. Yet a growing number of Americans are struggling with more advanced problems brought on by dementia.

Dementia represents a large category of disease conditions characterized by excessive, incapacitating loss of cognitive functions. While there are many known causes of dementia, the most common is Alzheimer's disease. Between 2 and 4 million Americans suffer from the condition, and researchers predict that the number will significantly increase over the next two decades.

Dr. Arthur Kramer, professor of neuroscience, has devoted much of his research to better understand the changes in human cognition that are associated with the aging process. He and his students and colleagues



Faculty Member in the Beckman Institute, Human Perception and Performance Group

at the Beckman Institute for Advanced Science and Technology are working to determine effective interventions to enhance cognition. Their research suggests that maintaining brain function may work much like retaining muscle function, lending some truth to the adage of "use it or lose it." According to the findings, aerobic physical activity and mental activity are beneficial in reducing the normal, age-related decline in cognition. "Just a few weeks of exercise for mice and rats will improve their learning and memory in the tasks that are used to test these functions," Dr. Kramer said. "We have no reason to believe that would be different for humans."

Dr. Kramer received his doctorate from the University of Illinois at Urbana-Champaign in 1984. In addition to being a full-time faculty member at the Beckman Institute, he is a professor in his alma mater's department of psychology, the campus neuroscience program and the Institute of Aviation. Health Matters.... from the A's to the ZZZZZZZ's

#### Monday, March 30, 2009

Whitley Auditorium 7:30 p.m.

Barbara Bancroft, RN, MSN, PNP



Executive Director and President, CPP Associates, Inc.

D uring the past century, advances in science have brought a greater understanding of human health than the world has ever known. People now hold the potential to maintain and enhance their health in ways their ancestors did not. At the same time, an increasingly health-conscious public is flooded with confusing, complex information and a plethora of new medical products and services.

Most of us desire a deeper understanding of how our bodies function and why they malfunction. We also want to comprehend the results of our medical tests, evaluate our medical options and practice intelligent prevention and health maintenance. But products and procedures are developing at such a rapid rate that even health-care providers sometimes struggle to keep up with the latest information. And many of them seem to have little time to bring the rest of us up to speed.

Barbara Bancroft, a registered nurse and pediatric nurse practitioner, has spent her career helping others understand complex health and clinical topics. As executive director and president of CPP Associates Inc., she devotes her time to providing continuing education for corporate groups and health-care professionals. She has led more than 2,000 seminars and discussions for groups as diverse as Smith Barney, the American Academy of Nurse Practitioners and the National Association of Biology Teachers. Whether the topic is understanding basic pharmacology or conquering cancer, Bancroft is widely acclaimed for her ability to summarize and interpret recent findings, make complicated issues understandable, and present information in a way that is appealing and funny.

A former health-care provider and university instructor, Bancroft is the author of several books, including *Medical Minutiae; Live a Little, Laugh a Lot;* and *An Apple a Day: The ABC's of Diet and Disease*. In 2004, she received the Distinguished Service Award from the National Association of Biology Teachers.

or more information about the departments of biology, physics, chemistry, mathematics, engineering, environmental studies and computing sciences, or the Voices of Discovery speaker series, call the Office of the Dean of Elon College, The College of Arts and Sciences, at 336.278.6263.





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