

**Human Impacts on Global Nitrogen:
The Next Big Problem?**
Wednesday, September 16, 2009
McCrary Theatre
7:30 p.m.

William H. Schlesinger, Ph.D.

*President, Cary Institute of Ecosystem Studies
Millbrook, N.Y.*



Every kindergarten student knows about the evils of carbon dioxide loading, the threat of resulting global warming and at least some strategies by which to address this looming crisis. An equally scary development, but one that is far less recognized, argues Dr. William Schlesinger, is the human impact on another important cycle: the nitrogen cycle.

Dr. Schlesinger is a biogeochemist: a scientist who studies the natural cycles by which chemicals move between the living and nonliving compartments of our world. Human activities are releasing carbon faster than natural processes can cycle it back into safer “storage.” Similarly, the release of nitrogen, both atmospheric and terrestrial, has been accelerated by activities such as the burning of nitrogen-containing fossil fuels and the heavy use of inorganic fertilizers for agricultural purposes. Scientists are concerned about increasing negative impacts of excess reactive nitrogen on plant and animal biodiversity, degradation of aquatic ecosystems and other consequences.

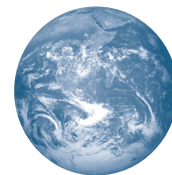
The Cary Institute of Ecosystem Studies, which Dr. Schlesinger leads, is an international leader in high-quality ecological research. Under Dr. Schlesinger’s leadership, the Cary Institute works to bridge the gap between science and policy needed to address today’s complex environmental problems. Books, articles, conferences and workshops sponsored by the Cary Institute encourage dialogue and information exchange among academics, practitioners and political leaders.

Before joining the Cary Institute, Dr. Schlesinger spent 27 years on the faculty of Duke University and was among the first scientists to quantify the amount of carbon held in soil organic matter on a global scale, enabling the role of soils in climate change to be estimated. He earned his Ph.D. from Cornell University, and he has served as a member of the National Academy of Sciences, past president of the Ecological Society of America and an Aldo Leopold Leadership Fellow.

**Environmental Nanotechnology:
Discerning the Influence of Nanomaterials
on Our World**
Monday, November 9, 2009
McCrary Theatre
7:30 p.m.

Kimberly L. Jones, Ph.D.

*Associate Professor of Engineering
Howard University*



Nanoparticles have always existed, but the relatively new field of nanotechnology is projected to revolutionize many aspects of human life while generating a multitrillion-dollar industry. Dr. Kimberly Jones specializes in this diverse field, which designs and uses microscopic nanoparticles whose dimensions are measured in billionths of a meter.

Nanotechnology, or engineering at the atomic and molecular levels, produces particles with unusual and useful functions. These nano tools potentially could be used to improve human health through medical diagnostics and targeted drug delivery. They also could greatly increase the speed of computing through novel semiconductors and quantum computers; alter commercial manufacturing processes and the properties of many common products, such as lighter and stronger construction materials; and improve the environment by reducing pollution associated with manufacturing, providing cleaner energy sources and cleaning up pollution through environmental remediation.

As with any rapidly emerging technology, many unanswered questions exist about the short- and long-term impacts and risks of human-designed nanoparticles on living systems and the environment. As a co-principal investigator with the Duke University Center for the Environmental Implications of Nanotechnology, Dr. Jones specializes in the movement of nanoparticles and how they transform in the natural environment.

Dr. Jones holds a master’s in civil engineering from the University of Illinois and a doctorate in environmental engineering from Johns Hopkins University. Currently on the faculty at Howard University, she has more than 15 years of experience in the nanotechnology field studying its biomedical and environmental applications. She has been recognized as one of “30 Women to Watch” by *Essence* magazine and one of the “Top Women in Science” by the National Technical Association.

Finding Your Inner Fish
Monday, March 8, 2010
McCrary Theatre
7:30 p.m.

Neil Shubin, Ph.D.

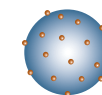
*Robert R. Bensley Professor, Organismal Biology
and Anatomy
Associate Dean, Organismal Biology and Anatomy
Professor, Committee on Evolutionary Biology
University of Chicago
Provost, The Field Museum of Natural History*



When was the last time you stopped to appreciate *your inner fish*? Dr. Neil Shubin, internationally acclaimed evolutionary biologist, writes: “Within each of us – our skeletons, our behavior and deep within our DNA – lurks our distant past. Make the relevant comparisons and we find that our hands resemble fossil fish fins, our heads are organized like long-extinct jawless fish, and the major parts of our genomes look and function like those of worms and bacteria.”

Dr. Shubin and colleagues discovered strong fossil evidence of the evolutionary connection between ancient lobe-finned fishes and subsequent tetrapods in northern Canada in 2004, and in 2006 they published their findings in the journal *Science*. The find was dubbed the “missing link” between fish and land animals – *the great transition* of vertebrates from aquatic to terrestrial existence approximately 370 million years ago, sprouting a huge, bushy branch of the tree of life. Named *Tiktaalik roseae*, the fossil exhibits distinct anatomical features of both fish and land animals, including fins and scales, a neck and a wrist. Reflecting on the significance of *Tiktaalik*, Dr. Shubin says, “it occurred to me that 3.5 billion years in the history of life are embedded in my own body.”

The *Tiktaalik* discovery highlights Dr. Shubin’s body of research, which focuses on the evolutionary origin of anatomical features of animals. His investigative approach involves a unique synthesis of information derived from paleontology, developmental biology and genetics. Dr. Shubin earned his Ph.D. in organismic and evolutionary biology from Harvard University in 1987. He is a Fellow of the American Association for the Advancement of Science and was elected a Fellow of the Academy of Arts and Sciences in 2009. A distinguished scientist and engaging writer, Dr. Shubin is the author of *Your Inner Fish: A Journey into the 3.5-Billion-Year History of the Human Body*.





Voices of Discovery

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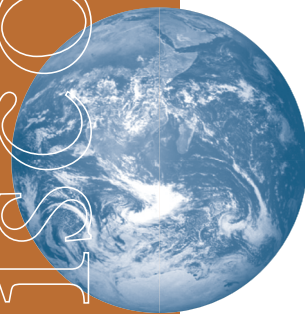
The College of Arts and Sciences at Elon University is committed to engaging students and the community in the excitement and wonder of discovery. During the past two decades, scores of discoveries in molecular biology, atomic physics and computer technology have changed the face of science and brought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

Voice of Discovery is just one element of Elon's program 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.



Voices of Discovery



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