Department of Energy Awards Ceremony

Office of Science
and
Office of Defense Programs

Early Career Scientist and Engineer Awards

James Forrestal Building
Room 1E-245
1000 Independence Avenue, SW
Washington, D.C. 20585
September 9, 2004

THE UNITED STATES DEPARTMENT OF ENERGY

OFFICE OF SCIENCE OFFICE

OFFICE DEFENSE PROGRAMS

EARLY CAREER SCIENTIST AND ENGINEER AWARDS

CEREMONY AND RECEPTION

Thursday, September 9, 2004

JAMES FORRESTAL BUILDING
WASHINGTON, DC

AGENDA

11:30 A.M. **Welcome and Opening Remarks**
Dr. Raymond L. Orbach, Director, Office of Science

Remarks & Introduction of Under Secretary David Garman
Dr. David H. Crandall, Assistant Deputy Administrator for Research, Development, and Simulation for the Office of Defense Programs, National Nuclear Security Administration

Address
UNDER SECRETARY DAVID GARMAN

Citations for Office of Science Awardees
Dr. Raymond L. Orbach
Presentation of Plaques
Under Secretary David Garman

Citations for Office of Defense Programs Awardees
Dr. David H. Crandall
Presentation of Plaques
Under Secretary David Garman

Closing Remarks
Dr. Raymond L. Orbach

12:00P.M. **Reception**

The Secretary of Energy
Washington, DC 20585

In Recognition and Appreciation

The Department of Energy today is proud to salute seven exemplary investigators from the Department's National Laboratories and collaborating universities. Each of these investigators is the recipient of one of the special annual awards the Department's Office of Science and Office of Defense Programs sponsor: the Early Career Scientist and Engineer Awards.

Along with the Office of Science and the National Nuclear Security Administration's Office of Defense Programs, I want to take this opportunity to recognize the extraordinary scientific and technical achievements represented by the awardees' contributions. These Departmental awards reflect our belief that the representatives of the new generation of scientists and engineers honored by these awards are meeting demanding scientific and technical challenges with superior leadership, knowledge and insight.

The awards demonstrate the Department's enduring interest in creative scientific and technical talent. Each honoree has made a distinctive contribution both as an independent investigator and as a team member. Individually and collectively, they continue to be sources of invaluable technical direction and expertise in support of the Department's research and development and national security missions.

It is absolutely crucial to these Departmental missions that we continue to invest in and to nurture the development of the technical leaders of the future. It is equally important that the Department, on occasions such as this, recognizes its critical need for active and sustained partnerships with the Nation's scientific and technical communities.

I am pleased to offer my heartiest congratulations to this group of outstanding investigators on the occasion of their receipt of these Departmental awards.

Spencer Abraham

Spencer Abraham

AWARDEES

Tamara Kolda
Sandia National Laboratories

Saskia Mioduszewski
Brookhaven National Laboratory

Margaret Torn
Lawrence Berkeley National Laboratory

Jian Shen
Oak Ridge National Laboratory

Catherine M. Snelson
University of Nevada, Las Vegas

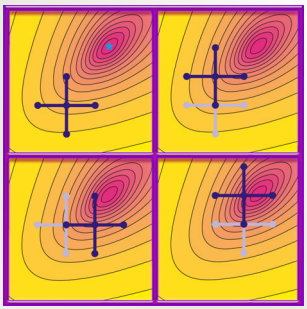
Donald P. Visco, Jr.
Tennessee Technological University

Brian D. Wirth
University of California, Berkeley

Tamara Kolda

Sandia National Laboratories

Dr. Tamara G. Kolda is an applied mathematician in the Computational Sciences and Mathematics Research Department at Sandia National Laboratories in Livermore, California. She has made significant contributions to a diverse set of areas in scientific computing including optimization, nonlinear solvers, tensor decompositions, graph algorithms, parallel computing and the design of scientific software. She is also known for the energy and enthusiasm she brings to mentoring and professional service.



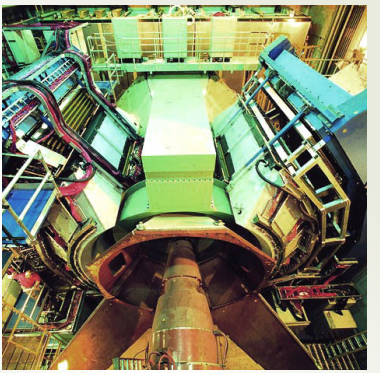
Dr. Kolda's research has impacted optimization methods for large-scale engineering simulations. She has developed efficient parallel pattern search algorithms to discover optimal designs. She has developed new mathematics which underlies the algorithms, and she has implemented her advances in parallel software. This software has been used on problems ranging from optimizing engineering processes to protein structure determination to improving circuit simulations.

"For innovative research in algorithms and software for scientific computing, optimization, parallel computing and nonlinear solvers."

Saskia Mioduszewski

Brookhaven National Laboratory

Dr. Saskia Mioduszewski is a physicist at Brookhaven National Laboratory, home to the Relativistic Heavy Ion Collider (RHIC). RHIC is a world-class facility for colliding heavy atomic nuclei at ultra-relativistic energies with the goal of creating a form of matter which existed in the early universe, the Quark Gluon Plasma (QGP).



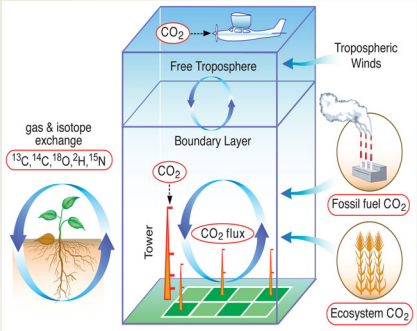
The main focus of her research has been the production of hadrons at high transverse momentum (pT) in these collisions. Dr. Mioduszewski has made essential contributions to the discovery of a suppression of these high pT particles in central Au+Au collisions, as well as the absence of such a suppression in d+Au collisions. Within the PHENIX experiment, she has been convenor of the physics working group that produced these important measurements. The results have led to the conclusion that a hot and dense form of matter has been formed in central Au+Au collisions at RHIC, which is consistent with conditions expected for the predicted QGP.

"For playing a leading role in the measurement of π^0 *production in Au+Au collisions at RHIC and observation of a suppression which is indicative of a new effect in dense nuclear matter."*

Margaret Torn

Lawrence Berkeley National Laboratory

Dr. Margaret Torn is a biogeochemist at Lawrence Berkeley National Laboratory, where she has developed an internationally recognized research program in climate change science and carbon management.



Dr. Torn specializes in the use of natural abundance and tracer isotopes (primarily ^{13}C, ^{14}C, ^{18}O) for studying the mechanisms of carbon turnover and storage in ecosystems.

Her fieldwork has taken her from Hawaiian rainforests to Alaskan tundra, from the Sierra Nevada to the Russian steppe. Dr. Torn's findings are filling critical gaps in the understanding of belowground carbon cycling and sequestration in soils. Her research has quantified the relationship between soil mineralogy and decomposition rates for the first time, and showed that certain soil minerals stabilize carbon for tens of thousands of years.

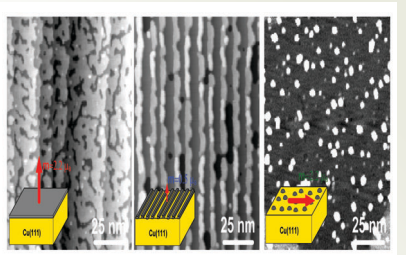
Dr. Torn heads three major research programs, including carbon research for the Department of Energy's Atmospheric Radiation Measurement Program (ARM). Her team has designed and deployed a suite of instruments that make ARM's Southern Great Plains site in Oklahoma among the world's best-equipped for regional carbon studies. The resulting data on carbon and isotopic fluxes has led to new methods of relating land use to atmospheric CO_2 concentrations in computer climate models.

"Margaret Torn is an internationally-known scientist leading the use of isotopes (primarily 13C, 14C, 18O) to understand, scale, and model carbon cycling. Her research provides critical advances in terrestrial carbon sequestration and quantifying regional sources and sinks of atmospheric CO2 for the DOE Office of Biological and Environmental Research and the US Climate Change Science Plan."

Jian Shen

Oak Ridge National Laboratory

Dr. Jian Shen is a Research Staff Member in the Oak Ridge National Laboratory Condensed Matter Sciences Division. He has conducted research on nanostructured magnetic materials that are critical for the applications of high-density data storage and spintronics. Dr. Shen's nanoscience research integrates novel fabrication procedures with sophisticated fabrication techniques and theoretical modeling for the design of nanostructed magnetic materials and complex oxides.



He and members of the Low-Dimensional Materials by Design Group at ORNL have recorded a major nanotechnology breakthrough by using his novel growth procedures to form one-, two- and zero-dimensional iron (Fe) nanostructures that open the way to advanced studies of nanomaterials' properties.

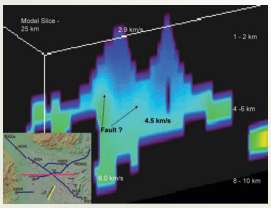
A key signature of Dr. Shen's research program is his mentoring and training of postdoctoral research associates and graduate students in this approach to nanoscience. Thus far since arriving at ORNL, he has advised three Ph.D. students, one of whom received the prestigious National Nottingham Prize. He has also mentored five postdoctoral associates and two summer intern undergraduate students.

"For his pioneering approach to the study of magnetism in nanostructured materials."

Catherine M. Snelson

University of Nevada, Las Vegas

Dr. Catherine Snelson is an Assistant Professor in the Department of Geoscience at the University of Nevada, Las Vegas. Dr. Snelson was nominated by National Nuclear Security Administration (NNSA) Lawrence Livermore National Laboratory for her research focused on integrating active source seismology and non-seismic techniques to study the structure and composition of near-surface geology as well as the continental lithosphere. Dr. Snelson's current research is concerned with characterization of the subsurface geology of the Las Vegas Basin in southern Nevada in collaboration with NNSA national laboratories. Her contributions to the understanding of the subsurface geology of the Las Vegas Valley provide significant enhancement of the understanding of how seismic waves propagate and amplify in the Las Vegas Valley. Dr. Snelson's work feeds essential data to the massively parallel geophysics models of Southern Nevada which encompass Las Vegas and the NNSA's Nevada Test Site. This work is a key element of a contemporary study of the potential effects of underground-test-generated ground motions in Southern Nevada.



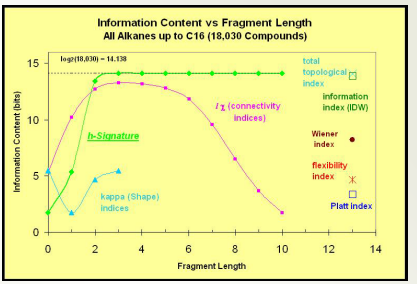
Dr. Snelson is an active member of the Nevada Earthquake Safety Council Education Committee as her work also provides a body of knowledge essential for improving understanding of the hazards from natural earthquakes in southern Nevada. Her leadership of the "seismology in the schools" program for grades K-12 is indicative of Professor Snelson's strong commitment to public service and community outreach.

"For her contributions to the characterization of the geologic structure of the Las Vegas, Nevada basin."

Donald P. Visco, Jr.

Tennessee Technological University

Dr. Donald P. Visco is an Assistant Professor in the Department of Chemical Engineering at Tennessee Technological University in Cookeville, TN. He was nominated by Sandia National Laboratories, a Department of Energy National Nuclear Security Administration Defense Programs Laboratory, for his insights into solving inverse molecular design problems by building molecular structures matching specific chemical activities and properties. Using quantitative structure activity and property relationships (QSAR/QSPR) analyses, he helped Sandia develop a series of computational tools that have been successfully used in the area of molecular design for many applications, including inhibitors for biowarfare agents. The tools are being used in materials design issues relevant to the stockpile, in particular, the problem of aging and organic materials. In the future, these tools could be applied to design chemical and biological sensors relevant to Homeland Security applications, e.g., for explosives and chemical/biological warfare agents.



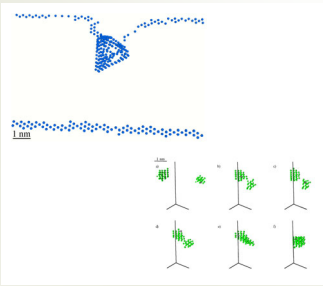
Dr. Visco has been a National Science Foundation Engineering Education Scholar. His work has resulted in five journal publications, seven conference presentations, and three awards.

"For contributing fundamental insights into solving inverse molecular design problems."

Brian D. Wirth

University of California, Berkeley

Dr. Brian Wirth is an Assistant Professor in the Nuclear Engineering Department at the University of California, Berkeley. Dr. Wirth was nominated by the National Nuclear Security Administration's Lawrence Livermore National Laboratory. The award recognizes his accomplishments in understanding the problems of time-dependent damage accumulation from incident radiation in a wide variety of metals including steels, copper, iron and vanadium.



Dr. Wirth's development of challenging and innovative computer simulations using molecular dynamics models has resulted in significant benefits to the Office of Defense Programs national security mission and for future fission and fusion power reactors.

Dr. Wirth has focused on the problem of damage produced in metals due to radiative interactions with neutrons and ions. Damage can occur from low radiation doses over years or from higher rates for shorter periods of time. Dr. Wirth's most recent contribution was the development of a new constitutive model for post-yield deformation behavior of irradiated metals. Dr. Wirth's research focuses on understanding radiation damage to structural materials in nuclear environments, including fission and fusion energy systems, and the aging of materials relevant to stockpile stewardship. The same techniques are being employed to develop new reactor vessel materials for potential future domestic power production.

"For his computational dynamics studies of dislocations and defects in metals, primarily those resulting from irradiation by neutrons and ions."

Department of Energy
Awards Ceremony
Early Career
Scientist and Engineer
Awards

James Forrestal Building
Room 1E-245
1000 Independence Avenue, SW
Washington, D.C. 20585
September 9, 2004