Carnegie Mellon. STEINBRENNER INSTITUTE for Environmental Education & Research



Morgan Elected to National Academy of Sciences

M. Granger Morgan, Head of Carnegie Mellon's Department of Engineering and Public Policy (EPP) has been elected to the National Academy of Sciences (NAS) for his distinguished and continued achievements in original research. Morgan shares this honor with 71 new members and 18 foreign associates from 12 countries.



"I am delighted with this honor. The work I have been doing on describing and dealing with uncertainty in environmental science, technology, and policy is highly interdisciplinary in nature. I am delighted that the NAS has recognized its contribution," says Morgan, who also directs the National Science Foundation's Climate Decision Making Center (http://cdmc. epp.cmu.edu/) and co-directs the Carnegie Mellon Electricity Industry Center (http://wpweb2.tepper.cmu.edu/ceic/).

Pradeep K. Khosla, dean of Carnegie Mellon's College of Engineering, praised Morgan for his legacy of public policy leadership in science, technology, and the environment. "Granger has been a consistent voice in helping this nation realize the need to curb carbon dioxide emissions," Khosla said.

Much of Morgan's work has focused on methods to describe scientific uncertainty and incorporate it into public policy decision-making. He has also worked extensively on risk analysis. With colleagues including Baruch Fischoff, Morgan has pioneered improved methods of communicating with the general public about technical risks. *Story continued on page 3.*

Taking Care of Business

In response to the Intergovernmental Panel on Climate Change report that found it "very likely" that human activities have caused "most of the observed increase in globally averaged temperatures since the mid-20th century," The Steinbrenner Institute sponsored "Business Strategies in a Carbon Constrained World" on April 18. The event, which was co-sponsored by Sustainable Pittsburgh, Citizens for Pennsylvania's Future (PennFuture), and the World Affairs Council of Pittsburgh considered the role of corporations in seeking solutions to global climate change as well as to showcase sustainable efforts already undertaken by the Pittsburgh business community.

Story continued on page 4.

Kevin Fay of PPG Industries Inc. used the image to the right from the United States Energy Information Statistics to reveal carbon emissions by sectors of the US economy.

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Upcoming Event

Homecoming Talk: Campus Wide Environmental Initiatives Hosted by Dave Dzombak Saturday, October 27 7:30-8:15 AM Connan Room, University Center Location subject to change

US Carbon Emissions by Sector



Colombian Supreme: Paolo Lugari honored



Lugari demonstrates how the Gaviotas seesaw water pumps function.

During this year's commencement, Carnegie Mellon bestowed upon Paolo Lugari, founder of the sustainable Colombian community Gaviotas, an honorary Doctor of Science and Technology degree. Lugari, a civil and environmental engineer, in the 1970s founded the Gaviatos community in Colombia, South America.

Lugari developed the Gaviotos community into a model village for social, economic and environmental sustainability through a potpourri of technologies, including hydroponic greenhouses that recycle waste from rice farms, biogas electricity generators, solar energy collectors, and water collection and purification systems. The sustainability technologies and processes employed in Gaviotas are remarkably simple and therefore very effective.

Lugari spent several days on campus during his brief stay in the United States and met with a number of community and campus groups, including the Green Design Institute. Lugari offered a lecture Friday, May 18 to a an audience of more than 100 attendees and the Colombian group of Pittsburgh, many of whom are affiliated with Carnegie Mellon hosted a lunch for Mr. Lugari the following day. Two of these community members, Gioconda Snyder and Miguel Rojas-Sotelo created a 25 minute documentary of Lugari's visit to Pittsburgh as a "humble contribution" to bring to light "Lugari's 40 years of work on sustainable development," according to the creators. The film has been authorized by Gaviotas and Paolo Lugari in order to raise funds for the Gaviotas reforestation project. For more information on the video please contact Gioconda, giocondapsnyder@gmail.com or Miguel, rojaszotelo@hotmail.com. For more information on Gaviotas please visit www.friendsofgaviotas.org

Architects on Strike The 2010 Imperative Teach-In



Carnegie Mellon students, staff and faculty as well as members of the Pittsburgh area architecture and building community joined thousands of people across the nation for a live webcast, "The 2010 Imperative Teach-In," February 20. The event was a success thanks to the enthusiasm of James Bogdan of The Sustainable Design Market Team at PPG Industries Inc, which sponsored the Teach-In. The webcast, hosted by The Steinbrenner Institute in McConomy Auditorium, originated

from the New York Academy of Sciences and connected the live audience with Ed Mazria, founder of Architecture 2030,

which challenges individuals to consider the role of the built environment in global climate change.

Read All About It

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For more information please visit www.architecture2030.org/

History Professor Joel Tarr has co-authored "The Horse in the City: Living Machines in the Nineteenth Century" with Clay McShane, professor of history at Northeastern University. The book describes the critical role that the horse played in the growth of 19th century cities, and examines the challenges posed in maintaining an environmment, that is safe and healthy for both animals and people. The book was published by The Johns Hopkins University Press.

For more information visit www.press.jhu.edu/



Center for Sustainable Engineering

The Center for Sustainable Engineering (CSE), a consortium of Carnegie Mellon, University of Texas at Austin, and Arizona State University, organized a successful series of workshops on July 16-20 in Austin, Texas. The purpose of the workshops was to assist engineering educators in the U.S. as they make changes in their courses and curricula to support the new paradigm of sustainable engineering. Examples of sustainable engineering include minimizing use of scarce resources such as materials, energy, water, and land at all stages of a product life cycle; minimizing discharge of pollutants at all stages of a product life cycle; maximizing the ability to reuse or recycle products at the end of their useful life; and minimizing activities that could contribute to global change, such as climate impact or the loss of stratospheric ozone. A total of roughly 60 engineering faculty from institutions across the U.S. attended the workshops. Sessions included discussions on teaching freshman courses, developing educational materials for use in class, benchmarking the status of sustainable engineering courses and programs throughout the U.S., and writing proposals for funding sustainable engineering research and education efforts.

The CSE is currently establishing an Electronic Library which will house educational materials on Sustainable Engineering for use in courses around the world. Anyone can submit materials for consideration by the CSE Electronic Library editors. Lecture notes, class handouts, homework assignments, powerpoint slides, and other materials can be submitted. All materials will be sent out for peer review before a decision is made on acceptance.



Information on future workshops and the CSE Electronic Library can be found at www.csengin.org.

Morgan Elected to NAS Continued from page 1

For more than a decade, Morgan has studied climate change and its potential impacts. A recent report he authored with fellow Carnegie Mellon faculty Jay Apt and Lester Lave for the Pew Center on Climate Change showed that the nation can largely eliminate carbon dioxide emissions from electricity generation over the next 50 years with just a 20 percent increase in the delivered price of electricity.

Morgan serves as chair of the EPA Science Advisory Board, the Electric Power Research Institute Advisory Council and the Scientific and Technical Council for the International Risk Governance Council of Geneva, Switzerland. He is a fellow of the American Association for the Advancement of Science, the Institute for Electric and Electrical Engineers, and the Society for Risk Analysis.

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Town Hall Meeting with PA DEP Secretary McGinty

Goals of the Governor's Proposed Energy Independence Strategy:

+ Save consumers \$10 billion in energy costs over the next 10 years.

+ Reduce Pennsylvania's reliance on foreign fuels and increase Pennsylvania's clean energy production capacity.

+ Expand Pennsylvania's energy production and energy technology sectors to create more jobs.

> For more information visit http://www.depweb.state.pa.us/ energyindependent/site/default.asp



Kathleen McGinty, Secretary of the Pennsylvania Department of Environmental Protection hosted a town hall meeting sponsored by The Steinbrenner Institute to discuss Governor Rendell's Energy Independence Strategy. More than fifty community members gathered May 17, 2007 to learn about the Strategy, which aims to save consumers \$10 billion over ten years in energy costs and reduce the state's reliance on foreign fuels. Governor Rendell announced the \$850 million Energy Independence Fund and Strategy in February.

The Carnegie Mellon Electricity Industry Center, the Climate Decision Making Center and other affiliated Steinbrenner Institute centers have initiated a robust research agenda focused on critical technologies and policy issues.

Examples of Carnegie Mellon's strengths include:

•Optimization of environmental control processes for the Integrated Gasification Combined Cycle clean coal.

•State of the art air quality modeling and analysis using the Pittsburgh Supercomputing Center and other advanced computational platforms for regional and global atmospheric modeling.

•New polymer technologies to advance applications of printable electronics for solar power and efficient lighting and Nanocomposite photocatalysts for solar hydrogen production.

•Membrane, electrochemistry and innovative thermochemical technologies to accelerate the engineering of carbon capture and sequestration.

•Analysis and development of well sealing technologies for carbon dioxide sequestration in abandoned oil and gas fields.

•Sensor and optimization technologies for smart grid and distributed energy technologies linked to improved building performance systems.

•Improved catalysts and reactors to enhance radically the efficiency of fuel conversion from feedstock.

•Public policy leadership in the formulation of strategies ranging from coal gasification to the strategic introduction of renewable technologies for state, federal, and international governments and industries.

Panel Addresses Corporate Sustainability Strategies

Continued from page 1

Carnegie Mellon President Jared Cohon welcomed a crowd of approximately 150 business representatives and academics to the event. Granger Morgan, Head of the Carnegie Mellon Engineering and Public Policy department offered a brief Global Warming 101 overview and introduced Pete Engardio, senior writer for Business Week, who gave a talk based on his January 2007 article titled "Beyond the Green Corporation." A panel discussion which included Christopher Flavin, President of WorldWatch Institute; William Rosenberg, Engineering and Public Policy Faculty at Carnegie Mellon; Kevin Fay, Director of Product and Supply Chain Stewardship, PPG; and Robert Bear, Director of Environmental Affairs, Alcoa immediately followed Engardio's presentation.

The Business Strategies event demonstrated that global warming represents not only an imperative but an opportunity for businesses to rise to the challenge and develop strategic plans to reduce their impact on the environment. The Steinbrenner Institute will continue to seek opportunities to partner with corporations to develop strategies to address their environmental impact.

Field Work After a Flood

Over the course of three days–May 2-4,2007–the Western Pennsylvania Brownfields Center (WPBC) faciliated a workshop to consider the redevelopment opportunities and challenges facing a 1.5 mile light industrial corridor in a second ring suburb north of the city of Pittsburgh, Pennsylvania.

The workshop was conceived and developed largely as a result of the devastation, both physical and economic, the corridor suffered in 2004 when Hurricane Ivan flooded the area and damaged its businesses. Four experts from across the country with experience in development challenges including those associated with flooding, traffic and transportation, and multi-jurisdictional decision-making participated in the workshop. After spending several days meeting with community members, these experts developed a list of next steps for the community to adopt in order to retain and grow current businesses as well as attract new enterprises.

The Western Pennsylvania Brownfields Center workshop model is based on the Regional/Urban Design Assistance Team (R/UDAT) process used by architects to engage a wide variety of stakeholders in an effort to promote consensus and action around a particular site. Designed to be transferable, the workshop model was developed to be a working session with a real



impact on the community. The workshop model has been implemented by the WPBC in a number of communities, both domestically and abroad.

For more information please visit www.cmu.edu/steinbrenner/brownfields/

Just Earth

Toxic dumping, landfills, lead poisoning, air pollution, brownfields, hazardous waste disposal, safe drinking water. These are issues that burden some segments of American society more than others, according to the Peter Madsen, Distinguished Service Professor of Ethics and Social Responsibility, who was responsible for the March 30-April 1 Environmental Justice Weekend, sponsored by

responsible for the March 30-April 1 Environmental Justice Weekend, sponsored by The Steinbrenner Institute.

What is Environmental Justice? Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws,

regulations, and policies. -US EPA

The weekend's speakers included Edwardo L. Rhodes (Heinz, '78), Professor of Public and Environmental Affairs at Indiana University; Kent Benjamin (Heinz, '90), Partnerships Team Leader, U.S. Environmental Protection Agency; Ronald Sandler, Assistant Professor of Philosophy, Northeastern University; and Deeohn Ferris, President of the Sustainable Community Development Group, Inc.

In an inventive immersion class model, students were able to gain 3 units of course credits by participating in the weekend and completing a substantial amount of reading and writing outside the sessions. Professor Madsen is offering another immersion course on corporate ethics in Spring 2008. Visit the Center for International Corporate Responsibility for more information: http://wpweb2.tepper.cmu.edu/cicr/activities.htm.

Steinbrenner Institute for Environmental Education \checkmark Research



Alumni Notebook Dr. Marilyn Bracken, B.S., '57



I have had a long and varied career starting with my graduation in 1957 with a BS in Chemistry. One month after graduation I married Jerome Bracken, CE (1956). We moved to Washington and have found it to be a wonderful place to build careers and raise a family. We have four children and six grandchildren. My graduate work was supported by the National Institutes of Health where

I combined chemistry and information science and received a M.S. and Ph.D. in Public Administration, Technology of Management, from The American University.

Following my Ph.D., I had increasingly responsible positions in government at the Department of Agriculture and the Consumer Product Safety Commission utilizing my chemistry, toxicology and information science background. I then had the opportunity to join the United States Environmental Protection Agency as Deputy Assistant Administrator, Office of Pesticides and Toxic Substances, where I managed interagency toxic substances strategies, the national program to monitor toxic substances and the U. S. participation in international activities in the control of toxic chemicals. I loved the international work and enjoyed meeting scientists from all around the world, not to mention traveling to Paris for frequent Organization for Economic and

Cooperation and Development (OECD) meetings. To the right is a photo from the Environmental Ministers Meeting of the OECD, in Paris, with Douglas Costle, former Administrator of EPA.

I left government in 1983 for the private sector and joined the Environmental Testing and Certification Corporation as Vice President of Product Testing and Liability. with other colleagues from EPA. We designed analytical test protocols and programs

consistent with changing toxic chemicals legislation, and assisted industrial and governmental clients in the management of environmental monitoring programs and analyses.

From there I went to Air \checkmark Water Technologies, Inc., an international environmental engineering firm that included subsidiary companies Metcalf \checkmark Eddy and Research Cottrell. First I functioned as President, Metcalf \checkmark Eddy of Puerto Rico which involved establishing a subsidiary company to provide the full range of Metcalf \checkmark Eddy environmental engineering and hazardous waste remediation services throughout the Caribbean Basin. I then moved on to be President, Air \checkmark Water Technologies (South Region) where I directed a staff of over 400 people with an annual operating budget of \$45 million, and integration of a \$25 million acquisition. Working for a publicly traded company on the New York Stock Exchange was an amazing and different experience from my days in government.

Wanting a less confining schedule, I started Bracken Associates, LLC and soon was spending most of my time with the Institute for Defense Analyses (IDA). IDA is a federally funded Research and Development Center which assists the Office of the Secretary of Defense, the Joint Staff, the Combatant Commands and Defense Agencies. A major study that I coauthored, "Issues and Alternatives for Cleanup and Property Transfer of Base Realignment and Closure



(BRAC) Sites," P-3538, Institute for Defense Analyses, August 2000 (www.denix.osd.mil) examined privatization of environmental cleanup of Defense Department BRAC sites.

Most of my recent work at IDA, as adjunct research staff member, involves technical support for the Director of Testing and Evaluation (DOT \notin E), Office of the Secretary of Defense on the



operational testing and evaluation of chemical and biological detection and diagnostic systems. I am currently evaluating the operational testing of the Joint Biological Point Detection System. Testing of these systems is in an operational environment with soldiers and equipment in the desert at Dugway Proving Ground, Utah or in the tropical environment of Eglin Air

Force Base in Florida, where required dress is shown above.

I received the Presidential Rank Award, Meritorious Executive, United States Government from President Carter in 1980. I am a Fellow of the American Association for the Advancement of Science and a Fellow of the Society of American Military Engineers and have been a member of three committees of the National Academy of Sciences. I received the Distinguished Alumna Award, The American University and the Chairman's Special Citation, U.S. Consumer Product Safety Commission.

RESEARCH FOCUS: For the sake of Fresh Air

Civil and Environmental Engineering Associate Professor Peter J. Adams has been awarded a \$900,000 research grant from the Environmental Protection Agency (EPA) to study how global climate change and international pollution impact U.S. air quality. Spyros Pandis, a chemical engineering research professor, is a co-investigator on the grant.

Peter Adams said he will build integrated models over the next three years that simulate air pollution from local to global scales. This work will build upon earlier research done by Adams and Pandis. Initially, the researchers combined a global climate model, a global atmospheric chemistry model, a regional meteorological model and a regional atmospheric chemistry model to determine how future climate change will affect air pollution in different parts of the U.S.

"Our new EPA-funded work will help us study and track dangerous neurotoxins like atmospheric mercury, and improve our understanding of the potentially more harmful particulate matter from sources such as cars, trucks and coal-burning power plants," said Adams, a member of the Center for Atmospheric Particle Studies (CAPS), an affiliate research center of the Steinbrenner Institute.

Fifty thousand Americans are thought to die prematurely each year due to particle exposure and almost 70 million Americans live in areas that violate the federal standard.

Particulate matter poses a serious health problem. Fifty thousand Americans are thought to die prematurely each year due to particle exposure and almost 70 million Americans live in areas that violate the federal standard. That standard was strengthened after scientists, armed with years of studies showing that these particles can damage the lungs and heart, advised the EPA that the previous daily standard of 65 micrograms per cubic meter of air was too loose.



CEE Professor Peter Adams

Adams will also base his particulate matter models on findings by Carnegie Mellon CAPS researchers Allen L. Robinson and Neil M. Donahue, who published a paper this year titled "Rethinking Organic Aerosols: Semivolatile Emissions and Photochemical Aging," in *Science* that revolutionized our understanding of major sources of organic particulate matter.

U.S. power companies have announced intentions to build as many as 150 new generating plants fueled by coal, adding to the 645 units that produce about half the nation's electricity. But these coal-fired electric plants collectively account for 67 percent of all the sulfur dioxide emissions in the U.S., which is a major precursor of particulate matter. The nation's top 50 coal-fired power plants averaged 21.1 pounds of sulfur dioxide per megawatt-hour, compared to only one pound per megawatt hour for plants equipped with state-of-the art scrubbers.

"Our previous research showed that climate change will make photochemical smog pollution worse. This means we need to cut pollution emissions more than if there were no climate change. In our future research, we will see if the same is true for particulate matter and mercury," Adams said.

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Carnegie Mellon Research Centers Affiliated with The Steinbrenner Institute

links to centers avaliable on www.cmu.edu/steinbrenner

CARNEGIE MELLON ELECTRICITY INDUSTRY CENTER CENSCIR: THE CENTER FOR SENSED CRITICAL INFRASTRUCTURE RESEARCH Center for Advancement of Applied Ethics eule' Political Philosophy CENTER FOR ATMOSPHERIC PARTICLE STUDIES CENTER FOR BUILDING PERFORMANCE AND DIAGNOSTICS CENTER FOR IRON AND STEEL MAKING RESEARCH CENTER FOR THE STUDY AND IMPROVEMENT OF REGULATION CENTER FOR INTERNATIONAL CORPORATE RESPONSIBILITY CENTER FOR SUSTAINABLE ENGINEERING CLIMATE DECISION MAKING CENTER DESIGN DECISION LABORATORY GREEN DESIGN INSTITUTE INSTITUTE FOR GREEN OXIDATION CHEMISTRY REMAKING CITIES INSTITUTE WESTERN PENNSYLVANIA BROWNFIELDS CENTER WATEROUEST: CENTER FOR WATER OUALITY IN URBAN ENVIRONMENTAL SYSTEMS

Visit the new Steinbrenner Institute website www.cmu.edu/steinbrenner

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