

Department of Civil and Environmental Engineering

INTERSECTIONS



50th Anniversary Fund Raising Drive

This year marks the 50th anniversary of the Fulton School of Engineering. The Department of Civil and Environmental Engineering will celebrate its 50th anniversary during the 2008-2009 academic year. To help move the department forward over the next 50 years, CEE is launching a fund raising campaign this



year that will culminate during the CEE anniversary year. Our goal is to develop an endowment that will help sustain our rise into the top ranks of civil and environmental engineering programs and provide funds to support our students, laboratories

and programs. Our objectives for this campaign include raising money for graduate student fellowships and undergraduate scholarships, research and teaching laboratories, and named professorships to support our research programs. We hope we can count on the support of our industry partners and our alumni to help us educate and train the next generation of engineers and

develop the new technologies our industry and our society need to sustain and improve the standard of living for everyone. Please give serious consideration to helping us when you are contacted to support this important initiative.

CEE FORGES AHEAD

A message from the Interim Chair, Ed Kavazanjian

The past few years have been exciting years for the Department of Civil and Environmental Engineering (CEE) at ASU. The civil engineering program received its highest national ranking ever this year, and the environmental engineering program, ranked for the first time, vaulted into the top 25 nationally. With the addition of new faculty, new laboratory facilities, and new programs, the 2006-2007 academic year promises to be just as exciting as the past few years as the department continues to move forward. Five new faculty members joined CEE this year, significantly strengthening our program in several key areas. This also marks the first full year of occupancy for our new laboratory facilities in ISTB-2 (Interdisciplinary Science and Technology Building Number 2), which houses new state-of-the-art laboratories for structures, pavements, geotechnics, and the National Center of Excellence for Sustainable Materials and Renewable Technology (SMART). This year also marks the first year of the new undergraduate curriculum,

the first year of the new graduate certificate program in Sustainable Technology and Management, and the 50th anniversary of the Fulton School of Engineering. Furthermore, the Fulton School has a new leadership team, including one of our own CEE faculty members. Paul Johnson. To cap off the excitement, we will be launching a three-year fund raising effort, culminating in the 50th anniversary of the Department of Civil and Environmental engineering in 2008-2009. Additional information is provided about these exciting advances herein and on the CEE website at <http://www.fulton.asu.edu/civil>.



FACULTY NEWS

2006 Paul L. Busch Award

The Water Environment Research Foundation (WERF) Endowment for Innovation in Applied Water Quality Research presented the 2006 Paul L. Busch Award to **Paul Westerhoff**, Ph.D., for his research investigating the fate of commercial nanomaterials in drinking water and wastewater treatment plants and their potential human toxicity. The Paul L. Busch award carries with it a \$100,000 research grant that will aid Westerhoff and his team as they attempt to provide fundamental knowledge of nanomaterial interactions that will facilitate their control in wastewater treatment plants. It is hoped that this research will improve operations of existing plant processes (e.g., membranes, filters, sedimentation basins, UV irradiation) and catalyze research opportunities on the beneficial use of nanotechnology in diagnostic tools or treatment processes.



Sandra Houston was appointed as a member of the National Academy of Sciences Committee on Geotechnical and Geological Engineering. Sandra Houston's article "Commentary: Women in Geotech... We Can and Must Do Better," appearing in the January/February 2006 issue of *Geo-Strata*, focused on women in engineering and in particular the geo-engineering field.

Brad Allenby's textbook, *Industrial Ecology* (co-authored with Tom Graedel at Yale) was recently translated into Korean. The leading textbook on industrial ecology, it had previously been translated into Russian and Chinese.

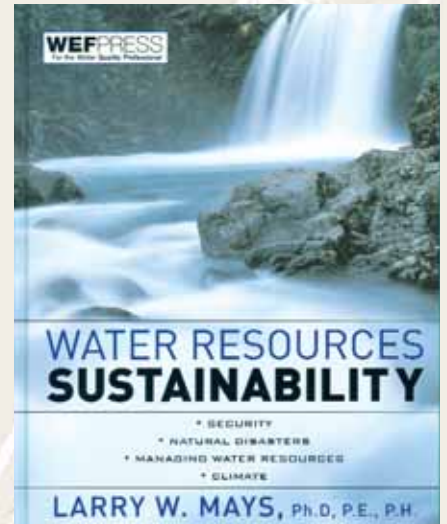
John Crittenden and **Yongshen Chen** co-authored the 2006 runner-up for the editors Choice Award for the most significant technology based paper submitted to the *Journal of Environmental Science and Technology* (Chen, Y., J.C. Crittenden, S. Hackney, L. Sutter and D.W. Hand "Preparation of a Novel TiO₂-Based p-n Junction Nanotube Photocatalyst," *Environmental Science and Technology*, Vol. 39, No. 5, 1201-1208 (2005).

In May 2006, **Ed Kavazanjian** delivered a keynote paper on "Strategy for Redevelopment of Old Landfills" at the Venice, Italy workshop of the European Union consortium for Sustainable Use of Old and Abandoned Landfills (www.Sufalnet.net). In June 2006, Kavazanjian delivered a keynote paper on "Waste Mechanics: Recent Findings and Unanswered Questions" at the GeoShanghai International Conference. He has also been invited to give the 10th Annual George Sowers State of the Practice Lecture at Georgia Tech on Landfill Engineering in May 2007.

Water Resources Sustainability, published by McGraw-Hill, was developed by **Larry W. Mays** as Editor-in-Chief with a group of leading experts from around the world in various disciplines related to water resources.

Mays has developed 17 books as author, co-author or editor-in-chief. As with all

of his books, *Water Resources Sustainability* is dedicated to humanity and human welfare. He is presently working as a volunteer with UNESCO IHP program (Paris) to develop a book titled *Integrated Urban Water Management in Arid and Semi-Arid Regions*. He continues his research efforts in developing the book *Ancient Water*.



Subby Rajan is working on two research projects dealing with impact damage mitigation. The first research project titled "FAA Development of Reliable Methodologies for Fan Blade Out Containment Analysis" is a Federal Aviation Administration sponsored research project with research partners as Honeywell Engines, NASA-GRC and SRI. FAA has also awarded a parallel project to develop material modeling for fabrics titled "LS-DYNA Implemented Fabric Material Model Development for Engine Fragment Mitigation". The FAA-sponsored research projects are in their sixth year with a total funding of about \$1.75 million dollars to date. Recently, the Army Research Office has awarded a \$297,000 research project titled "A Methodology to Design Multiphase, Graded Composites for Impact Mitigation" for the period 2006-2009. Both these research projects deal with modeling and design of high-speed projectiles and damage mitigation systems.

Paul Westerhoff, Bruce Rittmann and **Terry Alford** were awarded two new EPA projects which contribute to the strong portfolio of environmental nanotechnology projects at ASU: *Biological Fate & Electron Microscopy Detection of NPs During Wastewater Treatment* (Investigators: Paul Westerhoff, Bruce Rittmann, Terry Alford) and *Methodology Development for Manufactured Nanomaterial Bioaccumulation Test* (Investigators: Yongsheng Chen, Qiang Hu, Milton Sommerfeld, Yung Chang, C.P. Huang, and John Crittenden). Also in the portfolio is the current EPA project: *The Fate, Transport, Transformation and Toxicity of Manufactured Nanomaterials in Drinking water* (Investigators: Paul Westerhoff, Yongsheng Chen, John Crittenden, and David Capco).

New Faculty Greet the New School Year

Under Sandra Houston's leadership, the department added six new faculty members from 2003 to 2006, including two National Academy of Engineering members and several other senior faculty with national and international reputations. This year, we have added five more faculty members to that tally. The new CEE faculty members for 2006-2007 include two transportation engineers, one air quality specialist, a geotechnical engineer, and an earth systems specialist.



Ram Pendyala

In transportation engineering, **Ram Pendyala**, a nationally-recognized specialist in travel demand forecasting, joins us from the University of Central Florida as a tenured professor,

and **Soyoung Ahn**, a recent UC Berkeley graduate, joins us as a tenure-track assistant professor. Ram and Soyoung join Simon Washington, one of last year's new hires, to create a transportation systems group to complement our already strong transportation materials group and help us address the critical transportation problems affecting the Valley and the nation.



Soyoung Ahn

Also joining the faculty this year as a tenured associate professor in our environmental engineering group is **Jean Andino**. Jean, a National Science Foundation CAREER awardee (a highly prestigious award recognizing her excellence in research), comes to us from the University of Florida and specializes in atmospheric chemistry. Jean has a joint appointment with the Department of Chemical Engineering, though CEE is her tenure home.



Jean Andino

Tenure-track assistant professors **Eric Williams** and **Claudia Zapata** round out our cadre of new faces. Eric has a joint appointment with the Global Institute of Sustainability (GIOS) (with CEE as his tenure home) and joins Brad Allenby in our fledgling Earth Systems Engineering group.



Eric Williams



Claudia Zapata

Claudia, an ASU graduate, joins the geotechnical engineering faculty where she will continue her research work on expansive soils and pavement subgrades.

Visit the CEE web site at fulton.asu.edu/civil for more information about our new and existing faculty and our research and teaching programs.

New Arizona Water Institute Receives 70 Proposals for Water Research and Technical Assistance Projects

The Arizona Water Institute (AWI), a consortium of ASU, University of Arizona and Northern Arizona University focused on water sustainability through research, technical assistance, education and technology development, was initiated in 2006. AWI, supported by startup funds from the Arizona Board of Regents and the Arizona Legislature, announced a \$400,000 request for proposals (RFP) from across all three Arizona universities. AWI received 70 proposals requesting over \$3 million dollars, with another \$1.6 million in matching funds. A unique aspect of this call for proposals was the expectation that faculty would collaborate across two or more universities and link with water managers throughout the state. CEE faculty are well represented in the AWI. Paul Johnson is a member of the AWI Executive Committee and Jim Holway serves as the ASU coordinator for AWI. Paul Westerhoff and Morteza Abbaszadegan serve as research theme area leaders, Peter Fox is working with the U.S. Bureau of Reclamation on a salinity workshop, and many CEE faculty have submitted research proposals. Award selections for this first RFP will be made in November 2006.



STUDENT AWARDS

Congratulations to **Junbeum Kim** for being chosen as an award recipient by the Air & Waste Management Association (AWMA). Junbeum will receive \$600 for his technical paper about ELV recycling system submitted in the AWMA Grand Canyon Section Annual Scholarship. The award is made based on the quality of the paper submitted (relevance of topic, organization/writing ability, quality of research plan, technical merit, bibliography).

Jennifer Triplett Kingston, a graduate student in the Department of Civil and Environmental Engineering, is the recipient of the Achievement Rewards for College Scientists (ARCS) 2006-2007 Scholarship award in the amount of \$6,000. ARCS is a national organization dedicated to providing scholarship support to academically talented students majoring in the fields of Natural Science, Medicine, and Engineering. To qualify for an ARCS scholarship, a student must have a high scholastic record, proven ability in a scientific field, and be a citizen of the United States.



Maria Rodezno was recently selected as the new recipient of the Dean's Scholarships for the Department of Civil and Environmental Engineering. Each department in the Fulton school can select two outstanding graduate students to receive this prestigious award. Currently, Andrew Marcus is the department's other recipient of the scholarship.

This faculty-nominated scholarship allows students to maintain a dynamic research agenda that encourages creative individual work and, at the same time, promotes collaborative efforts focused around the Fulton School of Engineering. The award is

\$5,000 a year for three years. In order to qualify for the award a student must: be a new PhD student, work as a research associate of a department faculty, be in good academic standing, and be enrolled in at least 12 credit credits each semester. Ms. Rodezno has been a graduate student in the Department of Civil and Environmental Engineering at ASU since August 2003. She received her undergraduate degree in Civil Engineering at the Catholic University of Nicaragua, graduated with honors, and ranked first in her graduation class. Maria graduated with her M.S. degree from CEE in December 2005. She was admitted into the PhD program in Spring 2006.

Congratulations to the following participants who won awards at the 2006 Symposium on Research in Engineering and Applied Sciences (REAS'06) held on October 13, 2006 at Arizona State University.

Best Paper (\$300 award)

Zack Stahlecker (CEE-Structures)

Building a Fabric Material Model for Use in Modeling Engine Containment Systems

Best Presentation (\$150 award)

Sivakumar Palaniappan (CEE-Construction)

Implementation of Discrete Event Simulation Algorithm in C++ using Standard Template Library

Best Poster (\$150 award)

Junbeum Kim (CEE-Environmental)

Development of Materials and Parts Database System of End-of-Life Vehicles Recycling in the United States

CEE Oral History

As part of our 50th anniversary celebration, an oral history of the Department of Civil and Environmental Engineering at ASU is being compiled. We encourage you to log on to our website and submit a contribution to the oral history. We welcome both serious pieces on the evolution of CEE at ASU (e.g. a short note on when the first pavement or water quality testing laboratory was established) and anecdotes about your favorite professor or fond remembrance. The anecdotes will be includ-

ed in an appendix to the history (after screening by the web master, of course). We also plan to create an honor role of alumni from our first 50 years who have achieved distinction in their chosen fields, including those alumni who have pursued careers outside of CEE after receiving their CEE degree. We will be soliciting nominations of distinguished alumni for our honor role later this year.

2006-2007 Civil and Environmental Undergraduate Scholarships

4.0 Award

Shannon Wright



Caroline Newcombe



Michal Zabiegly



American Public Works Association
Scholarship: Elizabeth Nicol,
Albert Ruiz

Argyro Lalos Scholarship: Shayne Lopez

Arizona Society of Professional Engineers
Student Project Grant: Engineers with-
out Borders

Bruce T. Halle Scholarship: Patrick Mills

Carl W. Meng Scholarship: Katherine Jones

Charles & Nancy O'Bannon Scholarship:
Jennifer Arnold

Charles Newlin Scholarship: Taylor Bills

CMX Scholarship: Matthew Glancy

Collaborative Interdisciplinary Research
Community Scholarship: Scott
Andreasen, Arianna Valle

Collaborative Interdisciplinary Research
Community/Maricopa Engineering

transfer Scholars: Ivan Bermudez,
Armando Fuentes, Julian Galindo,
Tim Westbook

Distinguished Senior in Engineering:
Michal Zabiegly

Dorrance Family Scholarship:
Maria Contreras

Edward A. Cummings Memorial
Scholarship: Niqui Valdez-Goodloe

Elyse and Paul Johnson Environmental
Scholarship: Troy Benn

Engineering Grant: Rene Bermudez,
Claudia Lopez, Michael Steuart

Freshman Scholarship: Craig Bailey, Rafael
Hernandez, Shayne Lopez, Kristi
Mizner, Tyler Tinsley, Brandon White-
Taylor

Jan Tuma Memorial Scholarship: Sergio
Rivera, Rebecca Sydnor

Kenneth R. Geiser, Sr. & Kathryn Geiser
Memorial Scholarship: Scott Andreasen

Kimley-Horn Scholarship: Matthew Glancy

Marvin Sheldon Memorial Scholarship:
Jennifer Arnold

Rod J. McMullin, SRP Water Resources
Scholarship: Brooke Mayer, Ray Pulver,
Camille Smithson

National Action Council for Minorities in
Engineering Scholarship: Leslie Arriaga,
Rene Bermudez, Candace Pless,
Richard Polanco, Paulina Reina, Joshua
Salazar, Brandon White-Taylor

Nickless Scholarship:
Niqui Valdez-Goodloe

OTAK Scholarship: Shayne Lopez

Paragon Structural Design Scholarship:
Taylor Bills

Paul Mueller Concrete Scholarship:
Erica Eggen

Science, Math and Engineering Competition
Award: Kristen Barlish

Valley Paving Scholarship:
Camille Smithson

Wood/Patel Scholarship: Elizabeth Nicol,
Jared Geisler, Scott Andreasen, Shayne
Lopez

New Leadership for the Ira A. Fulton School of Engineering, CEE

Under the leadership of Sandra Houston, the Department of Civil and Environmental Engineering has made great progress over the past ten years. Sandy's leadership resulted in the civil engineering program being ranked 34th nationally according to U.S. News and World Report, up five places from 2006 and our highest ranking ever. Furthermore, our environmental engineering program, ranked for the first time, came in at number 23 nationally! However, after 10 years at the helm, Sandy decided it was time to devote her attention back to teaching and research. A nationwide search is underway for a new department chair who can continue to move our program forward. Ed Kavazanjian is leading CEE as the interim chair during the search.

There have also been changes in the executive administration of the Fulton School. In a unique new leadership structure, the school now has both a dean and an executive dean. These positions have been described as the CEO and COO of the engineering school, respectively. The new dean, Dr. Deirdre Meldrum, is an

electrical engineering professor from the University of Washington who holds an undergraduate degree in civil engineering. The position of executive dean is held by environmental engineering professor Dr. Paul Johnson. Deans Meldrum and Johnson will remain active in teaching and research while taking the Fulton School to the next level in achievement. In the short time they have been at the helm, they have already brought a new sense of purpose and vitality to the engineering school. CEE is proud to have one of our own as a member of this dynamic new leadership change.



Paul Johnson

2005-2006 CEE degrees awarded

CEE Graduate Alumni

Master of Science, MS

Carolina Baertsch
Andrew Baumgardner
Krishna Biligiri
Joby Carlson
Mohammad Islam
Erin Lyons
Pamela Maass
Brooke Mayer
Dnyanesh Naik
Jorge Navarro-Aragon
Justin Peterson
Channah Rock
Bo Song
Satish Sankaran
Jorge Santamaria-Carrera
D. Srinivasamurthy
Min Yi

Master of Science in Engineering, MSE

Raymond Craft
Heather Dye
Rocky Facelo
Nirav Hingoo
Ramzy Kahhat Abedrabbo
Sivasarayanan Natesan
Hynjoo Rah
Maria Rodezno
Rama Sabat
Renee Schwecke
Li Shen
Nicole Spence-Gibson
Timothy White

Doctor of Philosophy, Ph.D.

Mohammad Badruzzaman

Dissertation: "Mass Transport Scaling and the Role of Silica on Arsenic Adsorption onto Porous Iron Oxide (Hydroxide)"

Javed Bari

Dissertation: "Development of a new Revised Version of the Witczak E*Predictive Models for Hot Mix Asphalt Mixtures"

Sherif El-Badawy

Dissertation: "Development of a Mechanistic Constitutive Model for the Repeated Load Permanent Deformation Behavior of Subgrade Pavement"

Mohamad El-Zein

Dissertation: "Opto-Electronic Biosensor Design for Rapid In-Situ Detection and Characterization of Bacterial Biochemicalactivities in Water Environments"

Wontae Lee

Dissertation: "Occurance, Molecular Weight and Treatability of Dissolved Organic Nitrogen"

Roshan Makam

Dissertation: "Evaluation of Sustainable Removal of Doc in the Subsurface: Implications for Sat"

Andres Sotil

Dissertation: "Use of the Dynamic Modulus E Test as Permanent Deformation Performance Criteria for Asphalt Pavement Systems"

El Mohamed Said Ahmed

Dissertation: "Real Time Optimal Operation of Reservoir-River System under Flooding Conditions"

CEE Undergraduate Alumni

Summer 2005

John Tyldesley

Fall 2005

Darren Forstie
Eric Gardner
Erik Gibbs
Valerie Granger

Richard Hacker
Frank Jaramilla
Joe Jobe
Christopher Laute
Lindsey Lawlis
Chris Marks

Andrew McMillan
Christopher Miller
Willie O'Malley
Joseph Phillips
Isabel Quintero
Albert Ruiz

Matt Sheard
Darren Smith
Marilyn Surakus
Aaron Thomas
Susan Webber
James Whipple

Spring 2006

Jennifer Acuna
Joshua Ahrens
Brian Amos
Gary Andrew
Allen Barakovic
Brian Border
Frederick Bueler
Naida Causevic
Chi-Chi Choi

Jerome Choy
W. Clark
Trevor Collon
Miles Costanza
Christine Crawford
Rebecca Delvalle
Frank Garcia
Jared Geisler
Chris Hamilton
Michael Hansen
John Harrison

Daniel Hemken
Megan Hoyt
Kathryn Kleinschmidt
Morgan Kolod
Matthew Kucharski
Evie Lewis
Brett Lovro
Nathan Mascarenas
Daniel Matthews
Jeremy McAlister
Simon Mueller

Elizabeth Nicol
Michael Okamoto
Mandy Quedding
Patricia Quintana
Jeffrey Rath
Oliver Romo
Isai Sanchez
Robert Saunders
Jeffery Schaper
Terrence Shanklin
Allen Snyder

Bradley Squelch
Angeline To
Jennifer Traynor
Niqui Valdez-Goodloe
Arianna Valle
Ty Vance
Martin Weeden
Tim Westbrook
Shannon Wright
Michal Zabiegly

Friends of Civil Engineering (FOCE):

Friends of Civil Engineering (FOCE) enable the department to assist students with educational and research activities with the end result of providing the civil engineering community with well-rounded, educated professionals.

Your tax deductible gift is needed to maintain programs that have become a part of our students' experience. Last year your funds provided scholarships, textbooks, a career fair door prize of a laptop computer, travel to research meetings, travel funds for the ASCE student chapter, and a commencement luncheon for our new graduates entering the workforce. This year funds will be used for the same programs. Our student population has grown to an all time high of almost 600 undergraduates and 110 graduate students, while our state funding has dropped dramatically. With dwindling funding from the State, your contribution is needed in order to maintain these important programs for our students and your future employees.



Tom Schmitt, T & S Diversified (center) with the winners of the door prizes at the 2005 Industry Mixer sponsored by the Friends of Civil Engineering.



Students and Friends of Civil Engineering at the 2006 Career Fair

Friends of Civil Engineering Members

AMEC Earth & Environmental, Inc.
Ayres Associates
Black & Veatch Engineers
Brown & Caldwell
Carter & Burgess, Inc.
CMX, LLC
Coe & Van Loo Consultants
Damon S. Williams Associates
Dibble & Associates
Entellus
Erie & Associates, Inc.
GEC SA & B
Kennedy/Jenks
Kimley-Horn & Associates
Kleinfelder, Inc.
Kmetty, Chris and Sandi
Kmetty, Geza and Esther
Lee Engineering, LLC
Malcolm Pirnie Inc.
Nabar Stanley Brown
Otak, Inc.
Paragon Structural Design, Inc.
Parsons, Brinckerhoff, Quade & Douglas
PBS&J
Premier Engineering Corporation
RBF Consulting
Stanley Consultants, Inc.
Stantec Consulting, Inc.
T & S Diversified
Western Technologies, Inc.
Wood Patel and Associates

Active Committee Members:

Tom Schmitt, *T & S Diversified*
Bruce Kay, *Ninyo and Moore*
Chris Kmetty, *City of Peoria*
Cyndi Newman-Crane, *Kleinfelder, Inc.*
Dick Mettee, *Stanley Group*
Greg Mona, *Otak, Inc.*
Kent Dibble, *Dibble and Associates*
Kohinoor Kar, *ADOT*
Mike Manthey, *ADOT*
Ron Hilgart, *CMX, Inc.*
Wylie Bearup, *City of Phoenix*

New Curriculum, New Programs for 2006-2007

The 2006-2007 school year marks the first year of the new undergraduate curriculum in CEE. Based upon the ASCE Body of Knowledge and the Fulton School of Engineering educational objectives, the new curriculum include courses that stress the business and management aspects of our field and the importance of socio-political factors in decision-making on infrastructure development. In CEE 300, Engineering Business and Management Practices, our students not only get a healthy dose of engineering economics, including fundamentals of life-cycle cost assessment, but are also introduced to management aspects of civil and environmental engineering practice, including ownership structures for engineering firms, project delivery methods, cost accounting principles, and ethical considerations in business practice. CEE 400, Earth Systems Engineering, introduces students to the complex social, political, and cultural forces that shape our environment and influence decisions about investment in infrastructure, environmental protection, and economic development. This also marks the first year the new CEE laboratories in ISTB 2 are up and running. These laboratories, including the structures, pavements, and geotechnical laboratories, support both our teaching and research programs.

At the graduate level, this year marks the first full year for the Certificate Program in Sustainable Technology and Management. This is a joint program developed by the new ASU School of Sustainability (SOS), the W. P. Carey School of Business, and the Department of Civil and Environmental Engineering (on behalf of the Fulton School). CEE offerings that are part of the certificate program include courses on Sustainable Transportation Systems, Sustainable Water Supply, and Design for Environment. Many of the certificate courses are offered online through the ASU distance learning program. We anticipate that courses offered through the certificate program will help form the foundation for a new interdisciplinary program in Earth Systems Engineering and Management championed by civil and environ-



mental engineering professor Dr. Brad Allenby. More information on the sustainable technology and management certificate program can be found at: http://schoolofsustainability.asu.edu/Programs/Certificate_Sustainability.htm

Another significant addition to CEE in 2005-2006 was the establishment of the National Center of Excellence on Sustainable Materials and Renewable Technology (SMART) Innovations for Urban Climate and Energy. Focusing on technology-based solutions that lead to sustainable economic growth and a cleaner environment, the SMART center is lead by co-directors Kamil Kaloush of CEE and Jay Golden of SOS/GIOS (and a faculty affiliate of CEE). The SMART center is developing partnerships with leading researchers from Kings College London, the University of Cambridge, Tec de Monterrey, Indian Institute of Technology-Delhi, MIT and the University of Cape Town to provide students, faculty, industry and government with a unique range of educational and research opportunities. More information on the SMART center can be found at: <http://www.asusmart.com/>