

# School of Sustainable Engineering and the Built Environment

ANNUAL REPORT 2011

## delivering sustainable solutions



**Civil, Environmental  
and Sustainable Engineering  
(CESE)**

**Del E. Webb School  
of Construction (DEWSC)  
(Construction Management)**

**Construction Engineering**

# IRA A. FULTON SCHOOLS OF **engineering**

Transcending the traditional

Focusing on the student  
experience and student  
success

Inspiring future engineers

Pursuing use-inspired  
research

Attracting top faculty

**Dean**  
**Paul C. Johnson**

## **school of sustainable engineering and the built environment**

**School Director**  
**G. Edward Gibson, Jr.**

biofuels  
waste conversion to energy  
public health-technology-environment  
interactions  
microorganism-human health  
connections  
infrastructure and product lifecycle  
analysis  
earth systems engineering  
water purification  
resource-climate interactions  
indoor air quality  
SMART innovations  
transportation materials and systems  
project performance  
underground infrastructure

## **school of computing, informatics, and decision systems engineering**

**School Director**  
**Ronald G. Askin**

personalized learning  
educational gaming  
energy-efficient data storage and  
computing  
health informatics  
haptic interfaces  
assisting devices  
health care system logistics  
information assurance  
production logistics  
artificial intelligence  
transportation  
production logistics

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**School Director**  
**Stephen M. Phillips**

photovoltaics  
power and energy systems  
biosignatures discovery automation  
wireless implantable devices  
sensors and signal processing  
flexible electronics  
power grid management and stability  
sensors and sensing

## **school for engineering of matter, transport and energy**

**School Director**  
**Kyle Squires**

personalized learning  
engineering education  
K-12 STEM  
electrical energy storage  
thermal energy storage and  
conversion  
energy production separations  
therapeutics and bioseparations  
rehabilitation and robotics  
adaptive and intelligent materials  
high-performance computing  
simulations  
atmospheric processes

## **school of biological and health systems engineering**

**School Director**  
**Marco Santello**

medical diagnostics  
rehabilitation  
neuroengineering  
biomaterials and therapeutics delivery  
synthetic and systems biology  
healthcare technology





**Ira A. Fulton Schools of  
Engineering**

**School of Sustainable  
Engineering  
and the Built Environment**

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**Visit us on line at  
<http://engineering.asu.edu/sebe>**

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# Message from the Director



G. Edward Gibson, Jr., PhD, PE

Greetings! It is an honor to serve as the Director for the School of Sustainable Engineering and the Built Environment (SSEBE). Over the past year, I have had the great privilege to work closely with our faculty, staff, and students in setting the course for our future. Our School is a unique blend of civil and environmental engineering and construction management-focused programs.

This annual report highlights the diversity of activities and accomplishments that make up the collective experiences of our School. As we prepare a new generation of engineers and constructors, our efforts are redefining how we approach the problems that will challenge our future.

It has been a wonderful year for our students, staff, faculty, and alumni. Our students have won a number of prestigious awards and competed very successfully at regional and national competitions. They are matriculating and joining the workforce to help make our world a better place. I am very proud of the work our staff is doing supporting our school, and the recognition they are receiving. Our faculty members continue to win teaching awards, and at the same time, expended over \$9.1 million in cutting-edge research last year; a record for our school and an increase of 50 percent over the past five years. Finally, our alumni, young and old, are doing amazing things in their careers.

We are excited about the opportunities in front of us in 2012. In May, eight of our faculty members will be moving into the new ISTB IV building. We are currently planning the new Del E. Webb School of Construction space as the primary academic tenant in a new building set to be built in the Block 12 area near College Avenue. SSEBE administration will also occupy space in this new building that should be open in early 2014.

We are actively recruiting new faculty members. Although we bade farewell to four of our members in 2011, we attracted six outstanding new faculty members. The coming year promises more hiring, as we are pursuing faculty members for as many as eight positions.

We continue to work on improving our curricula and engaging our students in engineering and construction opportunities from the first day on campus. At the same time, we are putting plans forward that promise even more involvement of our industry partners.

The excitement within SSEBE is palpable, and if you are in Tempe, please contact me and come by for a visit.

G. Edward Gibson, Jr., PhD, PE

*Professor and Sunstate Chair*

*Director, School of Sustainable Engineering and the Built Environment*

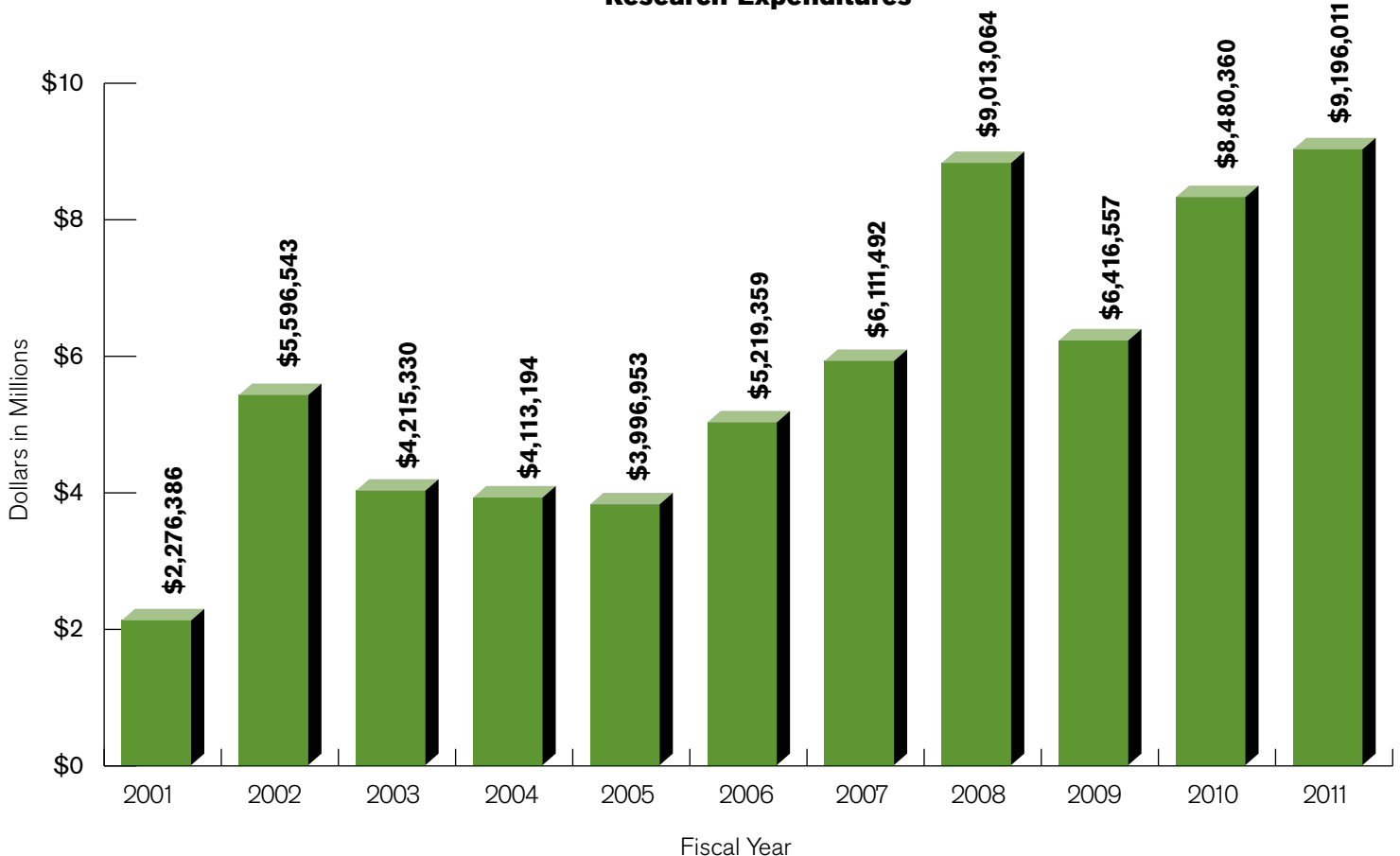
## Gibson named Director of SSEBE

**G. Edward (Edd) Gibson, Jr.** was named Director of the School of Sustainable Engineering and the Built Environment in March 2011.

He was appointed as interim director in August 2010. Gibson joined ASU in 2009 as program chair of the Del E. Webb School of Construction. He is professor and Sunstate Chair of Construction Management and Engineering in the School of Sustainable Engineering and the Built Environment.

Gibson has taught at the university level for over 20 years and has developed and taught numerous short courses for industry. He has won several teaching awards, including the Construction Industry Institute's Instructor of the Year and the National Society of Professional Engineers' Outstanding Engineering Educator.

**School of Sustainable Engineering and the Built Environment  
Research Expenditures**



# message from the program chairs

## CIVIL, ENVIRONMENTAL AND SUSTAINABLE ENGINEERING (CESE)

**Michael Mamlouk, PhD, PE**  
**Professor and Program Chair**



I am excited about the successes we've been experiencing in the Civil, Environmental and Sustainable Engineering program in the last year. Our academic programs have been growing with about 600 undergraduate students, 190 graduate students, and 30 teaching and research faculty.

Recently, we added to our faculty Drs. Mike Chester and Amy Landis in the sustainable engineering area, Dr. Matt Fraser in the environmental engineering area, and Dr. Zhihua

Wang in the hydrosystems engineering area.

We are increasing our emphasis in sustainability as an important tool to our graduates who would be using it on a daily basis throughout their career. We recently introduced the sustainable engineering concentration in the undergraduate curriculum and we have been incorporating sustainability in our courses. Our faculty have been increasing their research in sustainability and attracting a large amount of research funds in this area.

We are doing our best to provide hands on experience to our students at different levels. Our freshman students are heavily involved in developing projects in their Intro to Engineering class. We are also considering different alternatives to the senior design class by incorporating the ASCE concrete canoe and steel bridge projects.

We would like to keep in touch with our alumni and get them involved in our academic activities. Our Friends of Civil Engineering (FOCE) members have been working hard to improve the connection between our CESE program and industry. The annual Arizona Pavement/Materials conference organized by CESE with the cooperation of ADOT and the local pavement community has been attracting a large audience and has been receiving great feedback from the local industry.

I want to sincerely thank all of you who stand by our CESE program in so many ways. Your support has been crucial in helping us provide an excellent academic and research environment and enhance the opportunities for our graduates. We welcome new ideas for improving our program performance and creating endowment funds to recognize our outstanding faculty.

## DEL E. WEBB SCHOOL OF CONSTRUCTION (DEWSC)

**Avi Wiezel, PhD, PE**  
**Associate Professor and Interim Programs Chair**

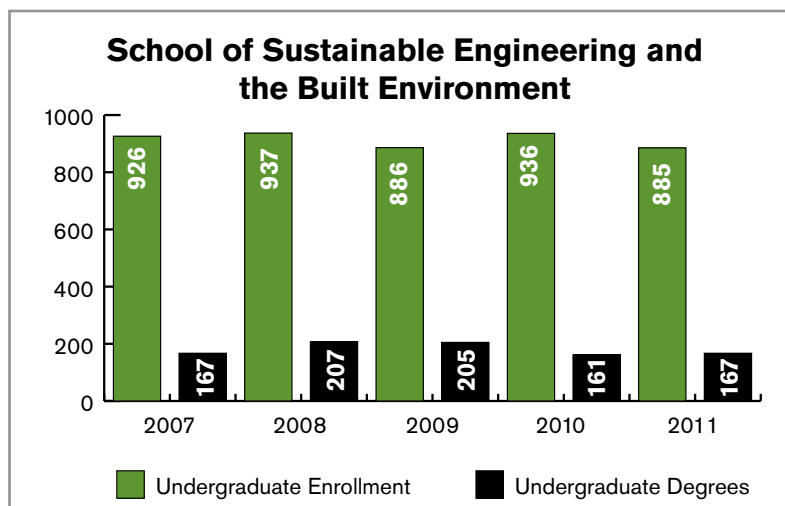


The Del E. Webb School of Construction Management Programs continued to consolidate their leading position among the academic programs in the nation. Even though the construction industry was still facing headwinds in 2011, more than 90% of the 89 DEWSC students who earned their bachelor of science in 2011 had appropriate jobs at the time of graduation. Compared to last year, the average starting salary for the DEWSC graduates was higher by about 5%, mainly thanks to a 10% increase at the upper range of the offers. Several graduates received offers above \$60K.

We attribute the success of our students to the continuous care of our professors and an increased collaboration between DEWSC and the industry. Throughout their education, each student benefits from a dual mentorship: one from a faculty member and one from an industry representative. We are also encouraging our students to become mentors themselves. By mentoring a junior fellow or a relative attending high school, they increase their emotional maturity and professionalism thus becoming more employable.

In addition to student mentoring and internships, industry members are directly involved in delivering course material to our students. Almost twenty faculty associates (domain experts who are teaching a full class at DEWSC) and about eighty guest speakers worked closely with the full time faculty to ensure that the material learned in classrooms is relevant and well delivered. The industry support of the DEWSC programs was further evident in the direct involvement of industry coaches in preparing our students for the annual Associated Schools of Construction Student Competition in Reno. DEWSC had the best overall performance, taking home trophies in five of the seven problem categories that we competed in.

At the graduate level, the PhD in Construction program has grown to 15 students and our new Doctors in Construction have already been hired by other universities. The PhD program is on its way to provide about 5 new professors per year to enter the construction education and research.



ASU recognizes the value of the DEWSC model of collaboration between students, faculty and industry, and has started to make significant investments in the DEWSC programs. These investments include a significant increase in the number of full-time faculty (hiring is on its way), a new building and support for the new learning laboratories that will be part of the new building.



## GRADUATE PROGRAM

### Subramaniam Rajan, PhD, PE Graduate Program Chair



The **Civil, Environmental & Sustainable Engineering** graduate degree programs continue to show a healthy growth in spite of the economic conditions.

From 2008 AY to 2011 AY, not only did the number of applications for the graduate program increase from 225 to 306 - a 36% increase, but so did the quality measured in terms of GPA, GRE scores and undergraduate/graduate institutions of the applicants.

Graduate specialty areas include environmental engineering, geotechnical engineering, hydrosystems engineering, structural engineering, sustainable engineering and transportation engineering. Currently there are 185 graduate students - 52 pursuing the MSE degree, 61 pursuing the MS degree and 72 pursuing the PhD degree. We have also seen a small increase in the number of enrolled under-represented groups and our goal is to make our program more diverse and inclusive. In the same period, the research expenditures have increased from \$5.6 million to \$9.1 million. This funding increase has enabled us to financially support a large number of our MS and almost all of our PhD students either as research assistants or as teaching assistants. We also graduated the first batch of Accelerated Bachelor's/Master's (aka "4+1") degree students. There are currently 24 students enrolled in this program and the numbers continue to rise showing how much students value the depth of knowledge they get in the graduate program.

The new **Master of Science in Engineering (MSE) in Construction Engineering** is currently underway with our first group of students enrolled in the program. This graduate degree is a multi-disciplinary program encompassing the civil engineering areas of geotechnical, structural, construction, and transportation with the business knowledge of construction management to prepare students for a career working at the interface of design and construction. Particular emphasis is on developing the necessary skill sets for students interested in a career emphasizing the construction of infrastructure. A construction engineering graduate degree focuses on planning, design, and management for the construction of facilities such as highways, bridges, pipelines, airports, railroads, industrial plants, buildings, dams, and reservoirs. Construction engineers typically engage in the design of temporary structures, cost estimating, planning and scheduling, materials procurement, selection of equipment, and cost control. Applicants must have an undergraduate degree in an engineering discipline to be admitted to the program since we are educating engineers who are eligible to be licensed as professional engineers.

## CONSTRUCTION ENGINEERING

### Samuel T. Ariaratnam, PhD, PE Construction Engineering Program Chair



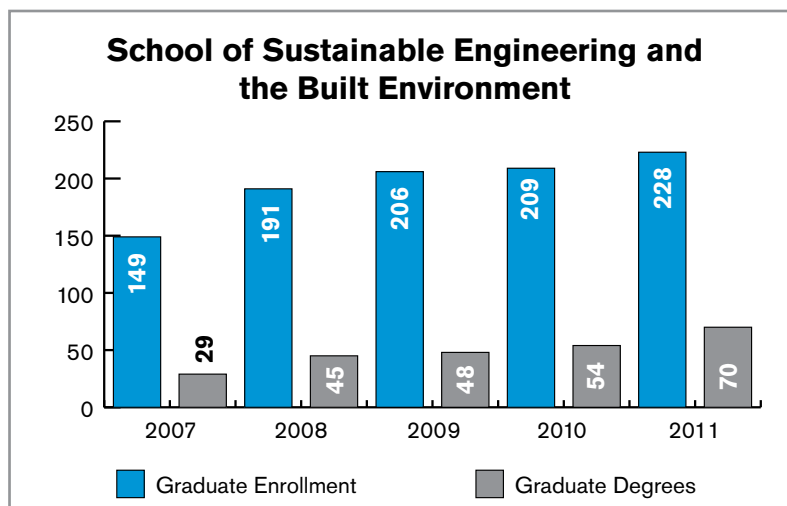
The newly formed **Construction Engineering** program is underway and we are excited about the opportunities for students interested in studying the engineering side of the construction industry. Both BSE and MSE degrees are offered.

This is the newest program in the U.S. and one of about 15 nationwide. The program focuses on planning, design and management for the construction of infrastructure projects including bridges, airports, pipelines, and other systems that are vital to our nation. Our program curriculum is an integration of Civil Engineering and Construction Management, which provides the best of both worlds in terms of exposure to engineering design and management of construction projects.

We currently have 17 undergraduate students enrolled in Construction Engineering and expect significant growth over the next few years as the program continues to mature.

Having a mandatory internship between the Junior and Senior year provides our students with invaluable exposure to the industry, making them desirable to future employers. Additionally, our graduates are well positioned to pursue graduate or advanced professional degree programs such as business or law. We expect our first graduate in fall of 2012.

We look forward to graduating future leaders with the skill set to work towards building and revitalizing our nation's infrastructure systems.



# new faculty join SSEBE



**Mikhail (Mike) Chester, PhD, University of California Berkeley** joined the Ira A. Fulton Schools of Engineering School as an assistant professor in the School of Sustainable Engineering and the Built Environment in 2011. He has a joint appointment with the School of Sustainability. Previously, he was a post-doctoral researcher at the University of California, Berkeley, and guest researcher at Lawrence Berkeley National Laboratory.

Chester's area of expertise is the energy and environmental assessment of large infrastructure systems. His research has focused on transportation systems and cities, evaluating life-cycle and supply chain effects and their associated human and environmental impacts. Chester's research expands the assessment boundaries of complex systems to understand comprehensive effects of policies and decisions, including infrastructure interdependencies. Ultimately, he is interested in determining the external control and damage costs of these impacts and how internalization of these costs may inform behavioral economics for sustainable policies and decisions.



**Matthew Fraser, PhD, Caltech**, associate professor in the School of Sustainable Engineering and the Built Environment and the School of Sustainability directs several research projects on urban air quality. His research focuses on using organic speciation and receptor modeling to apportion ambient pollutants to their original source. To tackle this complex problem, Fraser's research group has been involved in field monitoring programs, source characterization studies, emission inventory preparation, and analytical method and instrument development projects.

Fraser received his Bachelors of Science (with University Honors) in Chemical Engineering from Carnegie Mellon University and his Masters and Ph.D. in Environmental Engineering Science from Caltech. Prior to joining ASU, Fraser was on the faculty of Rice University in the Department of Civil and Environmental Engineering.



**Keith D. Hjelmstad, PhD, University of California Berkeley** is Professor of Mechanics in the School of Sustainable Engineering and the Built Environment. From 2008-11 Hjelmstad served as University Vice President and Dean of the College of Technology and Innovation at Arizona State University. Prior to coming to ASU he spent 25 years on the faculty at the University of Illinois at Urbana-Champaign as professor, associate dean for academic affairs, and a member of the Science Steering Committee of the Center for Simulation of Advanced Rockets.

Hjelmstad is the author of the book *Fundamentals of Structural Mechanics* (Springer, 2/e) and numerous articles on computational mechanics, earthquake engineering, stability of structures, nondestructive evaluation of large structures, and numerical simulation of complex structures.



**Amy Landis, PhD, University of Illinois at Chicago** joined the School of Sustainable Engineering and the Built Environment in January 2012 as an associate professor. Most recently a member of the faculty at the University of Pittsburgh, Landis brings a strong research portfolio in the area of sustainable engineering.

Her research interests include: life cycle impact assessment, biofuels, biopolymers and biolubricants. Her teaching interests include supporting underrepresented students and promoting diverse learning styles as well as encouraging active and collaborative learning. She has created service learning opportunities and outreach programs for high school students to encourage interest in the study of sustainable and green engineering.

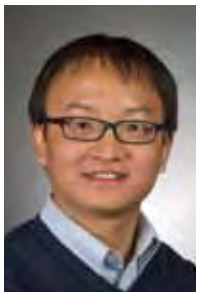


**Narayanan Neithalath, PhD, Purdue University** associate professor, joined the School of Sustainable Engineering and the Built Environment in April 2011. Neithalath received his Ph.D. in Civil Engineering (specializing in Concrete Materials) from Purdue University in 2004. His research interests are in the areas of sustainable cementitious materials and systems including high volume cement replacement materials for concrete, development of novel materials for desired performance levels such as pervious concretes, cement-free binder systems and lightweight aggregate concretes, and fundamental aspects of property development



in conventional and novel cementitious (and cement-less or alkali activated) systems.

Neithalath is also interested in transport properties of porous materials and modeling the structure-property response in a variety of porous media, electrical impedance sensing and sensor systems for infrastructural systems, and non-invasive and non-destructive testing of concrete. He has published over 100 papers in peer reviewed journals and conference proceedings, and has received several awards for his work on novel concrete materials including the NSF CAREER Award, Bengt Friberg Award for Outstanding Paper, and PCA fellowship.



**Zhihua Wang, PhD, Princeton University** joins the hydrosystems engineering faculty in the School of Sustainable Engineering and the Built Environment as an assistant professor. Previously, Wang was a post-doctoral research associate at Princeton University.

Wang's research interests include multi-scale environmental flows, urban hydrology and meteorology, boundary-layer meteorology, land-atmosphere interaction, atmospheric turbulence, computational mechanics, and heat and mass transfer. Wang is a member of the American Meteorological Society, American Physical Society, American Geophysical Union and International Association for Urban Climate.

Wang received his Ph.D. in environmental engineering and water research and M.A. in materials, mechanics and structures from Princeton University. He earned his M.Eng and B.Eng in civil and environmental engineering from Nanyang Technological University (Singapore).

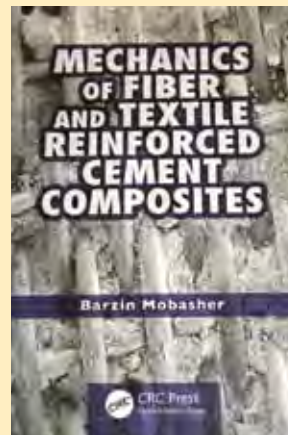


**Thomas Attard, PhD, Arizona State University** is an associate research professor in the School of Sustainable Engineering and the Built Environment and lecturer for Academic and Student Affairs. He has taught numerous courses, including Structural Dynamics, Advanced Composites, Inelastic Stress Analysis and Plasticity, Pre-stressed Concrete, Advanced Steel Design, and Statics.

Attard's current research focuses on the seismic retrofit of already-damaged structures using "CarbonFlex," which is a new patent-protected strength-sustainable composite that stabilizes crack growth in damaged substrates using an energy-dissipating mechanism.

Attard has served as chairman of two international conferences on Applied Mechanics and as the director of a large-scale experimental shaking table laboratory. He has published several journal articles and received federal and state research grants from Caltrans, NSF, DoE, and DHS. Attard has also served as coordinator for a Step-to-college high-school outreach program.

## Recent Books by Faculty



*Mechanics of Fiber and Textile Reinforced Cement Composites* by **Barzin Mobasher**, CRC Press, Taylor & Francis Group. Addressing recent trends and future directions, *Mechanics of Fiber and Textile Reinforced Cement Composites* presents new opportunities for developing innovative and cost-effective materials and techniques in cement and concrete composites manufacturing, testing, and design.

In the past year, **Brad Allenby** has had four books published:



*Industrial Ecology and Sustainable Engineering* (with Tom Graedel, published by Pearson/Prentice-Hall);

*The Theory and Practice of Sustainable Engineering* (published by Pearson/Prentice-Hall);

*The Techno-Human Condition* (published by MIT Press); and

*The Growing Gap Between Emerging Technologies and Legal/Ethical Oversight* (co-edited with Gary Marchant and Joe Herkert, published by Springer.)

# faculty honors and awards



**Paul Westerhoff** is the new associate dean for research in the Ira A. Fulton Schools of Engineering. He is a professor in the School of Sustainable Engineering and the Built Environment, and a senior sustainability scientist at the Global Institute of Sustainability. During his tenure, he has served as chair of Civil, Environmental and Sustainable Engineering and director of the School of Sustainable Engineering and the

Built Environment. Westerhoff has gained recognition for his research in the area of emerging contaminants and innovative treatment processes for water. His work has led to prominent research awards from the American Society of Civil Engineers and the Water Environment Federation. He has authored more than 120 peer reviewed journal papers during his career.



**Edward Kavazanjian**, professor, is the recipient of the **2011 Karl Terzaghi Award from ASCE**. The Karl Terzaghi Award is given to an author of outstanding contributions to knowledge in the fields of soil mechanics, subsurface and earthwork engineering, and subsurface and earthwork construction. This award is one of the most prestigious awards given to a geotechnical engineer. Kavazanjian was cited *"For application of the Principles of soil mechanics to the quantification of the Properties of municipal solid waste and the analysis and design of solid waste landfills."*



**Jason Lueke**, assistant professor in DEWSC and **Brooke Mayer**, lecturer in CESE won the **2011 EPICS Gold Faculty Mentor of the Year Award. EPICS**

(Engineering Projects in Community Service) solve engineering and technology-based problems with not-for-profit community

agencies, schools, and government units. This partnership provides many benefits to the students and the community alike. EPICS at ASU began in fall 2009, joining 20 other member universities. EPICS Gold projects are performed without charge by multi-disciplinary student teams comprised of a mix of freshmen through seniors, male and female, etc. Current projects include Bridges to Prosperity Team "Taming Water Cohort" in Guatemala and Bangla-EPICS Water Team "Bangla-EPICS Cohort" in Bangladesh. Each year EPICS gives out two awards for the mentors involved in the program.



**Paul C. Johnson**, dean, Ira A. Fulton Schools of Engineering and professor, School of Sustainable Engineering and the Built Environment, received the **Engineers Week 2011 Outstanding Educator of the Year Award**.

## ASU engineers will develop groundwater treatment technologies for EPA

**Paul Westerhoff** and **Kiril Hristovski** will lead a three-year, **\$500,000 U.S. Environmental Protection Agency** project to develop improved technologies for monitoring and removing common groundwater contaminants.

Westerhoff is associate dean for research in the Ira A. Fulton Schools of Engineering and a professor in the School of Sustainable Engineering and the Built Environment. Hristovski is an assistant professor in the Department of Applied Sciences and Mathematics in the College of Technology and Innovation.

The research will focus on developing effective groundwater treatment systems for smaller communities. Testing will be done in areas with extreme climates – Arizona and Alaska – that experience especially high or low temperatures. The results are expected to yield methods and technologies that can be applied to provide improved groundwater treatment systems in locations throughout the country.



**Barzin Mobasher's** paper titled *"Behaviour of strain-hardening cement-based composites under high strain rates"* published on the Advanced Concrete Technology has been selected as one of the best three papers of the year 2011 by the **Japan Concrete Institute**. This paper is a result of research collaborations with the Technical University of Dresden, Germany and Federal University of Rio de Janeiro,

Brazil. Mobasher is a professor in the School of Sustainable Engineering and the Built Environment.

## SSEBE Faculty receive NSF CAREER Awards

CAREER awards recognize young engineers and scientists who are demonstrating potential to be research and education leaders in their fields.



**Soyoung Ahn**, assistant professor, has received an **NSF CAREER award** for her proposal entitled *"Dynamic state transition in vehicular traffic and the effects of driver behavior."*



**Rosa Krajmalnik-Brown**, assistant professor, **NSF CAREER award** will provide more than \$430,000 over five years to help fund research she is conducting in the Center for Environmental Biotechnology on *"managing microbial communities."*



**Bruce Rittmann**, professor in the School of Sustainable Engineering and the Built Environment, has been named a **Fellow of the International Water Association (IWA)**. The IWA is a global network for engineers, scientists and other professionals in the water resources field. Its more than 10,000 members include researchers, utility managers, consultants, industry representatives, health regulators and equipment manufacturers. As a Fellow, Rittmann will have opportunities for collaborations with other leading IWA members.

Rittmann is an ASU Regents' Professor of Environmental Engineering, a Distinguished Sustainability Scientist with ASU's Global Institute of Sustainability and director of the Swette Center for Environmental Biotechnology at ASU's Biodesign Institute.

Rittmann also travelled to Washington, DC to receive the prestigious **Environmental Engineering Excellence Award for 2011** from the American Academy of Environmental Engineers for his hydrogen-based membrane biofilm reactor, a technology that is capable of removing nitrate, perchlorate, selenite, chromate and trichloroethene from water.



**Cliff Schexnayder**, PhD, PE, Dist. M.ASCE, faculty associate in DEWSC, is the recipient of the **ASCE OPAL Award for Education**. Established in 1999, the Outstanding Projects and Leaders (OPAL) awards recognize and honor outstanding civil engineering leaders whose lifetime accomplishments and achievements have made significant differences in one of five categories: construction, design, education, government, and management.



**Claudia Zapata**, assistant professor in SSEBE, will soon begin a three-year term as chair of the national Transportation Research Board's Committee on Engineering Behavior of Unsaturated Soils. The committee of about 30 members advises the board on matters important to establishing adequate engineering, construction and environmental protection standards for transportation infrastructure. Zapata has served on the board's unsaturated soils committee since 2007 and on the Seasonal Climatic Effects on Transportation Infrastructure committee since 2008. She also has played a leading role in various projects for the National Cooperative Highway Research Program.

## Top 5% Teacher Awards

Quality and innovative instruction is one of the top priorities of the Ira A. Fulton Schools of Engineering. Faculty are recognized for their excellence in instruction with an annual **Teaching Excellence Award** and **Top 5% Teachers List**. Students' nominations and feedback are reviewed by a faculty committee in determining these honors. Congratulations to the following SSEBE faculty for achieving the Top 5% List for 2010-2011.

**Christopher Lawrence**, lecturer

**Brooke Mayer**, lecturer

**Paul Westerhoff**, professor

**Avi Wiezel**, associate professor



# faculty honors and awards

## Professor helps lead international construction group



**Samuel Ariaratnam**, professor in the Del E. Webb School of Construction, School of Sustainable Engineering and the Built Environment since 2001, has taken on a top leadership role for a growing international engineering and construction technology association.

He is beginning a three-year term as **chairman of the United Kingdom-**

**based International Society for Trenchless Technology (ISTT)**, which has more than 5,000 members in 32 countries on six continents. He is only the second North American to serve as the organization's chairman.

The ISTT promotes the benefits of trenchless technology, a rapidly growing sector of the construction and civil engineering industry. It involves various advanced sustainable construction methods and technologies that can be used to install, repair or replace underground infrastructures with far less disruption to roadways, businesses and homes than conventional underground construction techniques.

Ariaratnam received an award from the **Polish Foundation for Trenchless Technology** for his contributions as Chairman of the International Society for Trenchless Technology and significant academic achievements in the area of trenchless technology. He was presented with a statuette at a ceremony held in Kielce, Poland.

Ariaratnam was also named as **North America's 2012 Trenchless Technology Person-of-the-Year** by **Trenchless Technology** magazine. He was cited for his contributions to advancements in the field of trenchless technology over his career. This is the highest honor bestowed upon an individual in the industry. He is the youngest recipient and only the third academic to receive this distinction.

Ariaratnam's teaching and research focuses on urban infrastructure management and rehabilitation. His expertise is in trenchless engineering applied to horizontal directional drilling, trenchless pipe replacement and underground utility asset management.

**Science Cafés** are informal discussions held at the Arizona Science Center that bring together members of the community and university scientists, to discuss how science and technology can change the future. In a typical café, scientists speak for 15-20 minutes on a topic, with the rest of the time for the public to ask questions and present concerns.



April 15, 2011 – **“Disasters in Arizona: Are We Prepared?”** **Edward Kavazanjian, Jr.**, PhD, PE, GE, Professor, School of Sustainable Engineering and the Built Environment and Tim Lant, Research Director, Decision Theater and Decision Center for a Desert City, Assistant Research Professor, Department of Mathematics and Statistics.



May 20, 2011 – **“Germ-Free and Other Myths: Examining Antimicrobial Products”** **Rolf Halden**, PhD, PE, Associate Professor, School of Sustainable Engineering and the Built Environment and Ben Hurlbut, Assistant Professor, School of Life Sciences.

## Dean's Lecture Series, Ira A. Fulton Schools of Engineering



January 20, 2011 – Dean's Lecture Series: **“What is taking so long? The Empire State Building was completed in 14 months, the Pentagon in 16 months and we made it to the moon in a decade. Why do “simple” buildings, bridges and highways seem to take years?”** **G. Edward Gibson, Jr.**, PhD, PE, National Academy of Construction Member, Director, School of Sustainable

Engineering and the Built Environment.

March 15, 2012 – Dean's Lecture Series: **“Learning from adversity: Shake, rattle and row”** **Edward Kavazanjian, Jr.**, PhD, PE, GE, Professor, School of Sustainable Engineering and the Built Environment. Enhancing Infrastructure Resilience Through Post-Disaster Reconnaissance.

## Leaving a legacy



**William (Bill) Badger** retired from the Ira A. Fulton Schools of Engineering this year, leaving a legacy of progress and innovation in construction education.

In his last lecture, Badger shared leadership wisdom—55 nuggets—with a crowded room of students, faculty, family, alumni, donors, advisors and friends. His book, *The DNA of Leadership*, is aimed at emerging professionals in the construction industry, but his insights are applicable to all.

Badger has served as professor in the Del E. Webb School of Construction for 25 years, including 17 years as the school's director. His vision and commitment have helped ASU garner recognition as one of the top construction programs in the nation.

Over the course of his tenure, Badger helped build many of the Del E. Webb School of Construction's endowments and scholarships, including the \$4 million endowment after which the school is now named. Recently, Badger initiated a significant campaign to support the school.

Prior to his work at Arizona State University, Badger had a distinguished 26-year career in the U.S. Army Corps of Engineers, serving in China, Vietnam, Saudi Arabia, Europe and the United States.

A registered Professional Engineer and member of the National Academy of Construction, Badger holds a doctoral degree in soil mechanics from Iowa State University, a master's in civil engineering from Oklahoma State University and a bachelor's in mechanical engineering from Auburn University.



**Matthew Witczak**, a professor in the School of Sustainable Engineering and the Built Environment, retired from ASU in May 2011. He served on the faculty of the University of Maryland for 26 years before becoming professor of Civil Engineering at ASU in 1999.

Witczak is an internationally recognized expert in the area of highway and airfield pavements. He has been involved in numerous worldwide consulting activities and has been invited to speak in all five continents. Witczak has received many

honors and distinctions including the Asphalt Institute Honor Roll, Walter J. Emmons Award of the Association of Asphalt Paving Technologies and the Thomas B. Deen Distinguished Lectureship Award.

Witczak graduated with his PhD in Civil Engineering from Purdue University in 1969. Nearly 50 years later he has retired from academia after teaching 41 years of his professional career. His teaching experience has spanned Purdue University, The University of Maryland and Arizona State University. In addition to his academic career, he has had the great fortune to work on hundreds of consulting projects, in all corners of the globe, covering over 70 different countries.

The Last Lecture of Professor Witczak focused upon a critical assessment, via his own experiences, impressions and opinions, of how civil engineering education has changed for the good and bad over the last 50 years.

*This year two of our faculty moved on to new appointments. **Eric Williams**, assistant professor in the School of Sustainable Engineering and the Built Environment and the School of Sustainability has joined the faculty at Rochester Institute of Technology and **Panagiotis Mitropoulos**, assistant professor in the Del E. Webb School of Construction has joined the College of Engineering at San Diego State University. We wish to thank them for their service and wish them good luck in their new positions.*

## Bridging construction and engineering generation gap

A torch-passing phase is on the horizon within the nation's construction and engineering industries. The 30-and-younger set is in line to begin replacing significant numbers of retirement-age construction managers and engineers.

Industry watchers are wondering how well the transfer of wisdom and know-how will go between members of a generation who began careers in the days before personal computers and cell phones and a younger generation that has grown up in the age of the Internet and the dawn of social media.

Professor emeritus **William Badger** and associate professor **Avi Wiesel** with ASU's Del E. Webb School of Construction weigh in on cross-generational communication challenges in a report by a leading construction and engineering industry news publication.

"The Gen Y people have a different value system and way of communicating," says William W. Badger, a professor emeritus at Arizona State University, who mentors select upperclassmen. When managing Millennials – or Gen Y's as he likes to call them – he notices they want fewer rules and more freedom. "The new perception of fairness in management is to treat everyone as special, not to treat everyone the same. The bad boss micromanages and controls; the good boss gives high degrees of freedom."

Badger's co-researcher, Avi Wiesel, says the Millennials work best if information is "cut into bits of what they need to know" and delivered on a schedule of when they need to know it. Computers process information the same way.

In 2009, in a Pew Research Center survey of 1,850 Americans on the factors that define the Millennials and previous generations, 73% cited use of computers and new technology.

Badger says his students have an outside-the-firm professional network – comprising friends, family and other connections – which they use to answer questions 24 hours a day. "Their speed of communicating is so much faster than us old people," says Badger. He thinks the technological communication skills of construction project managers will definitely change as the Millennials take the stage.

*Article source: Engineering News-Record*

# student honors and awards

## 2012 International Road Federation (IRF)

### 63RD CLASS OF FELLOWS



The IRF Road Scholar Program identifies promising international students currently enrolled in graduate programs at IRF Member universities in the United States. The Executive Fellows are recommended by their professors, and must demonstrate not only great educational accomplishments, but a strong desire to use their education in their home countries.

As Executive Fellows, these students are invited to participate in the Road Scholar Program, alongside IRF's current class of Traditional Fellows, which is designed to provide the Fellows with a better understanding of the process of doing business in the transportation industry in the United States, the importance of leadership, and the benefits and merits of the International Road Federation. The Road Scholar Program allows IRF members to make contact with some future international leaders before they return to their home countries.

**Jeffrey Stempihar** – Recipient of the **Reed/Valley Slurry Seal Fellowship** – Area of Academic Study: Pavements and Materials Engineering

**Srinivasa Srivatsav Kandala** – Recipient of the **Eng. Abdullah A. Al-Mogbel Fellowship** – Area of Academic Study: Traffic Congestion and Transportation Planning

## Undergraduate Honors and Scholarships

**Fall 2011 Barrett Honors: 57**

**Fall 2011 Merit Scholars: 297**

**Scholarships: 92 recipients**

**For a total of \$297,863**

## Udall scholars advance tribal health care, environment



**John Kondziolka**, a junior concentrating on environmental engineering, is one of the recipients of the **2011 Udall Scholarships**. Kondziolka wants to help develop sustainable water systems, becoming a leader in new technologies for

water purification. He is active in the ASU chapter of Engineers Without Borders, and has worked on refurbishing a water system in a small village in Ecuador.

## DEWSC AWARDS

### Fall 2010

*Outstanding Senior* – **Chase Farnsworth**

*Leadership and Service* – **Silvino Villanueva, Ashleigh Feiring, Josephine Bierwagen**

### Spring 2011

*Outstanding Senior* – **Rebecca Freitas**

*Leadership and Service* – **Brittany Hoste**

### Fall 2011

*Outstanding Senior* – **Kaitlyn Mulhollan**

*Leadership and Service* – **Alex Bertheau, Homero Garcia Jr.**

## CESE AWARDS

### Spring 2011

*Outstanding Senior* – **Joy Marcella**

### Fall 2011

*Outstanding Senior* – **Amie Stockwell**

*Leadership and Service* – **Frederick Tack, Bobby Cottam**

*4.0 Award* – **Grant Dickerson**



## Construction students provide holiday gifts for children



Joshua Marriott and Ashley Bagley sort through toys collected for Cardon Children's Medical Center.

This past holiday season, **Joshua Marriott**, a senior in the concrete industry management program, led an effort that obtained donations from more than a dozen local construction, engineering and concrete companies, and partnered with the **Arizona Builders Alliance** annual toy drive to collect truckloads of toys.

Marriott began the drive with some fellow members of ASU's student chapter of the American Concrete Institute (ACI).

The ACI student chapter provided funds to buy posters to promote support for the toy drive. As word spread, the director of the state ACI professional chapter, Jim Rodgers, solicited donations from his group. **James Erzen**, an associate professor in the Del E. Webb School of Construction programs, asked students in his classes to contribute.

More than 900 toys were contributed by ASU students and faculty and local companies, including Suntech, Cemex, Drake, Ninyo and Moore, the ACI Arizona Chapter, CSW, AMEC, Cal Portland, the Ira A. Fulton Schools of Engineering student advising office, Perlman and Perlman, Climatech, TDI, Kortman Electric, Sundt, T-Pac, DP Electric, Rural Electric and others.

With additional donations from Arizona Builders Association members, about 2,000 toys were delivered to the medical center a few days before Christmas.

**Leila Kabiri-Badr**, a PhD student in SSEBE, is one of 14 winners of the **Achievement Rewards for College Scientists Scholarship**.

**Ali Fakih**, a PhD student in SSEBE, has been appointed by the City of Scottsdale Mayor Lane and Council Members to serve on the **Development Review Board**.



**Arizona Water Scholarships for 2011** were awarded to **Michelle Barry** (\$750) and **Chao-An Chiu** (\$250).

**Michelle Barry** was also selected as the **Fresh Ideas winner at the AZ Water Conference**. As the Fresh Ideas winner Michelle's travel expenses including plane and hotel were covered

to Washington DC for the AWWA's National Conference ACE where she presented her work in the form of a poster contest.

## Engineering student one of 12 to receive national scholarship

Civil engineering junior **Adriana Ruiz** was named an **Obama Scholar** by the Hispanic Scholarship Fund (HSF) in August 2011. Ruiz received \$2,500 at the beginning of the school year and will be awarded an additional \$2,500 next year. The scholarship was given to 12 Hispanic students nationwide — including students from USC, Harvard and UA — who plan to pursue a career in teaching high school science, technology, engineering and math classes. Ruiz said she plans to pursue a teaching career in one of these fields after earning her master's degree. The scholarship is funded by a donation of \$125,000 to the HSF from President Obama's 2009 Nobel Peace Prize award money.



**Jorge Luis Amaya**, a civil engineering undergraduate student, was selected for a competitive internship with the **Federal Highway Administration** over the summer of 2011. Out of 1,000 applicants Amaya was one of 100 who earned an internship position. He worked in D.C. at the FHWA agency and was recognized as one of the top 5 interns in the program at the conclusion.

**Fariya Sharif**, a PhD student in SSEBE, has been chosen as one of the **2011 Watereuse AZ Scholarship** winners.

**Vanessa Chavez** has been selected to receive a **Ford Graduate Engineering Fellowship** for \$5,000. Chavez received \$2,500 in fall 2011 and \$2,500 in spring 2012.

The Transportation Research Board **2011 Pyke Johnson Award** for the Best Paper in the Planning and Environment topic areas was awarded to **Karthik Konduri**, PhD student, **Xin Ye**, former PhD student and post-doctoral researcher and **Bhargava Sana**, former graduate student. The paper was titled "Joint Tour-Based Model of Vehicle Type Choice and Tour Length." Faculty advisor is Professor Ram Pendyala.

# student honors and awards

**Kyle Doudrick's** paper entitled "Photocatalytic Reduction of Nitrate in Water Using Titanium Dioxide Loaded with Silver" won 3rd place in the **Geosyntec's Student Paper Competition for 2011**.



**Keith Christian**, a master's student in civil engineering, was selected to receive a **2011 Dwight David Eisenhower Graduate Fellowship**. The estimated amount of the fellowship is \$62,300 plus \$1,500 to attend the 2012 TRB Annual Meeting in Washington DC. The objectives of the Dwight David

Eisenhower Transportation Fellowship Program are to attract qualified students to the field of transportation and advance transportation workforce development.



**Joy Marsalla**, a student in **ASU's Barrett, The Honors College**, was awarded one of the highly prized **Tau Beta Pi fellowships** to support students seeking graduate degrees in engineering.

**Alexandra Polasko** is the recipient of the **Arizona Stockholm Junior Water Prize, Regional Water Prize Award Ricoh Sustainable Development Award, Excellence Award for Biological Sciences, and Association for Women in Science Silver Medal, Microbiology Division**.

**Amie Stockwell** is the SSEBE awardee of the **Graduate College Reach for the Stars \$15,000 Fellowship**.

**Arjun Krishna Venkatesan** has been awarded the **Phoenix/Scottsdale Groundwater Contamination Scholarship for Environmental Science for 2010-12**.



**Kristen Barlish**, recipient of the prestigious **Fulbright Scholarship** and the **outstanding graduate award** from the Del E. Webb School of Construction, is now working on her master's in construction management. With a deep interest in building efficiency, she will travel to Italy to study how addressing facilities management needs upfront can lengthen the lifecycles of industrial buildings.

**Elham Bani Hashem**, a PhD student in Geotechnics/Pavement Materials, won the **2011 Helene M. Overly Memorial/Esther Kmetty Scholarship** awarded by the **Women's Transportation Seminar Phoenix Metropolitan Chapter**.

## Helping to bring holistic approach to sustainable urban development



ASU engineering grad student **Alexander Baish** has a key role in a collaborative effort involving researchers at ASU and Mexico's Monterrey Institute of Technology and Higher Education (commonly shortened to Tec de Monterrey). They've formed the Water Innovation Consortium to do the groundwork for providing the city of Monterrey and its suburbs a modern and sustainable water resources management system.

Monterrey is one of Mexico's most prosperous cities but with a population of about four million the region is far from fully prepared for the rapid economic growth and land development it has been experiencing, and its lack of quality water resources infrastructure could threaten its opportunities for success.

Among the most critical of challenges is ensuring access to an adequate water supply and the safety of that water, and providing extensive flood protection. The need for the latter became dramatically clear when a rampaging flood resulting from Hurricane Alex pummeled the region last year.

Baish's adviser, **Enrique Vivoni**, an associate professor in the School of Sustainable Engineering and the Built Environment and the School of Earth and Space Exploration, is a leader of the consortium-one of several sustainability projects Vivoni is conducting in Mexico.

Vivoni sent Baish to Monterrey last spring for a month of field work and data collection with partners at Tec de Monterrey.

Baish is producing simulations that account for the topographical, environmental and meteorological conditions that made the area so vulnerable to flood waters from the hurricane storm. He is also helping set up workshops to educate the local populace and its government, industry and community leaders, and prepare them to contribute to the design process.

## Doctoral Graduates

### Spring 2011

#### Abdullah Alsanad

PhD Dissertation: *Novel Biopolymer Treatment for Wind Induced Soil Erosion*

Chair: Dr. Edward Kavazanjian

#### Simon Ghanat

PhD Dissertation: *Duration characteristics of mean horizontal component of the shallow crustal earthquake records in active tectonic regions*

Chair: Dr. Edward Kavazanjian

#### Seung Lim

PhD Dissertation: *Quantitative Structure Analysis Relationships for Predicting the Fates of Future Contaminants in Indirect Potable Reuse Systems*

Chair: Dr. Peter Fox

### Summer 2011

#### Mehdi Bakhshi

PhD Dissertation: *Controlling Early-Age Cracking and Improving Transport Properties to Achieve Sustainable Cement-Based Materials*

Chair: Dr. Barzin Mobasher

#### Mohamed G. Arab

PhD Dissertation: *The Integrity of Geosynthetic Elements of Waste Containment Barrier Systems Subject to Seismic Loading*

Chair: Dr. Edward Kavazanjian

### Fall 2011

#### Mohammad Abbaszadeh

PhD Dissertation: *The Effect of Cracks on Unsaturated Flow and Volume Change Properties of Expansive Clays and Impacts on Foundation Performance*

Chair: Dr. Sandra Houston

#### Carlos Cary

PhD Dissertation: *Characterization of the Pore Water Pressure Response of a Soil Subjected to Traffic Load*

Chair: Dr. Claudia Zapata

#### Mehlika Kiser

PhD Dissertation: *Fate of Engineered Nanomaterials in Wastewater Treatment Plants*

Chair: Dr. Paul Westerhoff

#### Jie Sheng

PhD Dissertation: *Downstream Processing of Synechocystis for Biofuel Production*

Chair: Dr. Bruce Rittmann

## Doctoral Graduates in the new Construction Management Program

### Fall 2010

#### Leonard Robert Kawecki

PhD Dissertation: *Environmental Performance of Modular Fabrication: Calculating the Carbon Footprint of Energy Used in the Constructions of a Modular Home*

Chair: Dr. Howard Bashford

### Summer 2011

#### Marcel M. Maghiar

PhD Dissertation: *Crew Coordination Modeling in Wood-Framing Construction*

Chair: Dr. Avi Wiesel

## Graduate Fellowships

Dean's Fellowship \$25,000

**Alexander Baish  
James Gifford  
David Hanigan  
Chase Holton  
Levi Straka  
Kirk Vance**

Fulton Fellowship \$5,000

**David Hanigan  
Benjamin Rehder  
Levi Straka**

Science Foundation  
Arizona (SFAz)  
Fellowship \$25,418

**Bridget Cavanagh  
Isaac Roll  
Daniel Rosenbalm**





# students 2010/11 Scholarship Awards

**Congratulations to the following students on their achievement and a special thank you to the donors for their contributions.**  
**Total scholarships were awarded in the amount of \$297,863.**

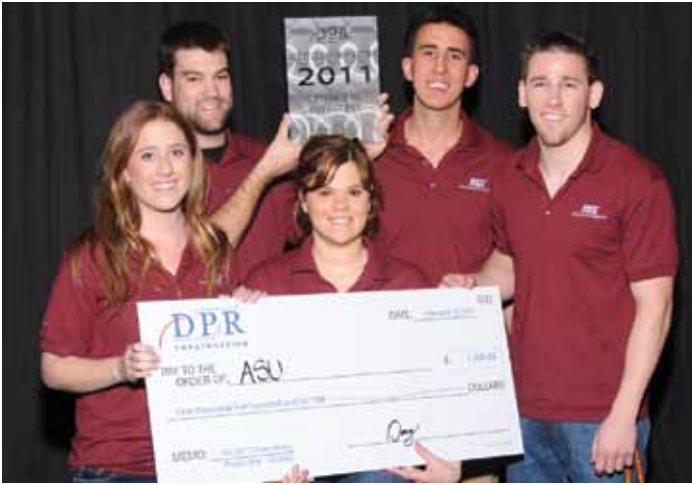
## DEL E. WEBB SCHOOL OF CONSTRUCTION

A.G.C. Construction ASU Student Scholarship	Jacob Carver, Brennon Fish, Joshua Marriott, Jonathan Meek, Joshua Mischung, Adam Walter
Advancing Minorities in Construction Award	Cynthia Barela, Enrique Collazo, Eduardo Duenas, Robert Kong, Alejandro Mota, Angel Rosas, Luis Ruiz
Andrew Hanneman Scholarship	Jonathan Meek and Natalie Wilkins
Bechtel Construction Scholarship	Ashley Bagley, Joshua Brown, Che Chavez, Gaired Fressadi, James Padilla, Kelly Reimers, Adam Walter
Ben C. Griggs Memorial Scholarship	William Fugett
CFMA Joseph J. Quigley Memorial Scholarship	Kaitlyn Mulhollan and Jared Stradling
Charles and Nancy O'Bannon Scholarship for Construction	Alyssa Erspamer
D. L. Withers Construction Scholarship	Lindsay Johnson
Daniel and Katherine Mardian Scholarship	James Padilla
Dave Clifton Memorial and ASPE Chapter 6 Scholarship	Joshua Marriott
Del E. Webb Foundation Finance and Accounting Scholarship	Carolina Gaxiola and Amanda Nichols
Del E. Webb Foundation Undergraduate Student Scholarship	Bryan Langdorf
Del E. Webb Foundation Women in Construction Scholarship	Jessica Metler
Del E. Webb Memorial Scholarship	Joshua Mischung and Kimberly Rahberger
Dr. Sandra L. Weber Memorial Scholarship	Rayna Koon
FNF Construction, Inc. Scholarship	Domenic Styer
Frank M. Chandler Memorial Scholarship	Cassandra Hudec
James Fann Memorial Scholarship	Jacob Carner, Justin Kilduff, Michael Lynch
Jan Bennett Endowed Scholarship	Nathaniel Gorrocino
Jason McElroy Memorial Scholarship	Ryan Ramos
Jerry King Scholarship	Jonathan Meek
Jim Bebout Scholarship	Joseph DeMatteis
Native American Construction Management Scholarship	Leonard Black, Kammy Harding, Joshua Litson, Buu Nygren, Jeffrey Yazzie, Sylvester Yazzie, Heston Zonnie
Opus West Construction Corporation Undergraduate Scholarship	Benjamin Swanson
PENTA Building Group Scholarship	Ashley Bernardez, Skyler Holloway, Cassandra Hudec, Lindsay Johnson, Chase Roberts, William Scott
Pulte Home Corporation Scholarship	Adam Walter
R. Glen Schoeffler Scholarship	Gary Aanenson
Robert H. Johnson Undergraduate Scholarship	Brennon Fish, Brandon Gallimore, Skyler Holloway, Kimberly Rahberger
Robert J. Wheeler Memorial Scholarship	Joshua Brown, Michael Lynch, Brian Park
Ron Pratte Scholarship	Jonathan Meek
Samuel F. Kitchell Undergraduate Leadership Award	William Brandon, Che Chavez, Brennon Fish, Gaired Fressadi, Brad Jensen, Rayna Koon, Joshua Mischung, Kimberly Rahberger, Christian Sosinski, Adam Walter, Ryan Whitt
The Ames Family Scholarship	Sabrina Scott and William Scott
The Beavers Heavy Construction Scholarship	Rayna Koon and Luis Ruiz
William G. Rein Construction Scholarship	Kelly Reimers

## CIVIL, ENVIRONMENTAL & SUSTAINABLE ENGINEERING

APS Diversity Scholarship	Jose Reyes
Arizona Society of Civil Engineers (AzSCE) Scholarship	Michaela Doherty
Arlo Richardson Endowed Scholarship	Ryan Sariego
Carl L. and Jean Wolcott Meng Memorial Scholarship	Andrew Chill
Charles and Nancy O'Bannon Scholarship	Elizabeth Barnes
Charles Lemon Memorial Scholarship	Bryan Wright
CIRC Scholars Program	Jorge Amaya, Melissa Archer, Christopher Gino, Antonio Lopez, Nathan Merrill, Ivan Ramirez, Ashley Welton
CIRC/METS Scholars Program	Matthew Aguayo, Erick Barrios Ponce, Triana Gonzalez Neves, Cari Henning, Brannon Maldonado, Lauren McBurnett, Breeann Sharma
Civil and Environmental Engineering General Scholarship	Bobby Cottam, Triana Gonzalez Neves, Sam Grombacher, Cari Henning, Jose Reyes, Jacob Vander Vis
Elyse and Paul Johnson Scholarship	Nathan Dunkin
Jan Tuma Memorial Scholarship	Erick Barrios Ponce
Kenneth R. and Kathryn Geiser Memorial Scholarship	Lindsey Beames
Kiewit Companies Scholarship	Erick Barrios Ponce and Ashley Bagley
Martin H. Rosness Memorial Scholarship	Jan Joseph Bitoon
Marvin Sheldon Memorial Scholarship	Sara Toovey
Mike Kolling Memorial Scholarship	Nicholas Palmer and Cynthia Barela
National Association of Corrosion Engineers (NACE) Arizona Section Scholarship	Tate Jensen
Paragon Structural Design, Inc. Scholarship	Benjamin Immonen
Rod J. McMullin SRP Water Resource Scholarship	John Kondziolka and Joshua Steele
Stanley Consultants Scholarship	George Whitten
Terry Bourland Memorial Scholarship	Vanessa Chavez
Wood, Patel and Associates, Inc. Scholarship	Sam Grombacher

# Students shine at construction competition



The Project Risk team consisted of (left to right) Alexandra Taylor, Scott Carfi, Rebecca Freitas, Josh Mischung and Ian Kennedy.

Each year ASU students travel to Reno, NV to compete in the **Associated Schools of Construction (ASC)** competition. This year 50 students consisting of eight teams competed against teams from universities and colleges in the West Coast and Southwest that have construction management programs.

ASU placed **first** in the **Determining Project Risk** competition that challenged students to assess the risks for the construction of a large medical and research building for the University of California in San Francisco. Students had to show how they would manage costs and work schedules, negotiate subcontractor services and work out site logistics.

The **Design-Build** team took **third** place in the Design-Build category. Students had to devise viable plans for a 1,100 stall parking structure that could be integrated into an adjacent casino/



The Design Build team consisted of (left to right) Richard Stradling, Jessica Haycock, Skyler Holloway, Brittany Hoste, William Dietz and Bret Burnham.

amphitheater complex in Tucson. The project had to be cost-estimated, designed and built within roughly one year.

Teams were judged by representatives of companies who worked on these actual projects. Besides showcasing their skills, students met with industry recruiters. Many companies in construction and related businesses sponsor the competitions. ASU's teams are supported in part by more than 20 local construction companies, some of whose employees volunteer time to mentor student teams.

The primary goal of the competition is to prepare students for their eventual careers in construction by working through real-life problems and scenarios that they actually might encounter.

ASU competed with teams in the following problem categories: LEED, BIM, Determining Project Risk, Design Build, Commercial, Heavy/Civil, and Electrical Concrete. All teams gave solid efforts and represented ASU well.

## Friends of Civil Engineering



Bridges to Prosperity student group work on pedestrian bridge in Honduras

Friends of Civil Engineering (FOCE) in the School of Sustainable Engineering and the Built Environment Civil Engineering program help support our students to achieve success.

FOCE supports a variety of student activities, including:

- Textbook scholarships to offset expenses
- Travel to research meetings and conferences
- Mixers to help students make industry connections
- Student organizations projects and outreach in the community
- Commencement luncheon honoring new graduates

## 2011 member list

AMEC Environment & Infrastructure, Inc.  
Black & Veatch Corporation  
Carollo Engineers  
Coe & Van Loo Consultants, Inc.  
Consultant Engineering, Inc.  
Dibble Engineering  
Entellus, Inc.  
Erie & Associates  
FNF Construction, Inc.  
Harvard Investments, Inc.  
HilgartWilson, LLC  
Kiewit  
Kimley-Horn and Associates, Inc.  
Michael Baker Corporation  
Nabar Stanley Brown, Inc.  
Prelude Engineering Consultant Services  
RBF Consulting, a Michael Baker Company  
T & S Diversified  
Wood, Patel & Associates, Inc.



# ASU think tank aims to aid construction industry recovery

**Can the industry return to what it was before the recession, or will recovery require fundamental structural changes in the way construction and design companies do business?**

**If the down-market period persists, how fast and extensively can the industry transform itself to ensure a healthy survival?**

**How does the industry need to reshape itself in the next decade to protect against future downward cycles in the economy?**



*Gary Aller, Director, Alliance for Construction Excellence, Del E. Webb School of Construction, School of Sustainable Engineering and the Built Environment*

Historically, the United States has never recovered from an economic downturn without a corresponding resurgence of the construction industry.

Today 10 percent of American jobs are dependent on the construction and related design industries, so it's critical that effective strategies be implemented to spark their recovery.

The **Alliance for Construction Excellence (ACE)** at Arizona State University has been studying the impact of the extended economic recession on the construction industry with the goal of helping it chart a path toward renewed prosperity. To expand

that effort, ACE is organizing and guiding a series of think tank sessions, bringing together industry leaders from around the country to address questions pertinent to that goal.

"The recession has altered our industry's methods of delivering its services, changed business owners' attitudes and reduced profit margins," Aller says. "The balance of power has shifted into a buyer's market in which owners are driving contracting methods and influencing the construction process."

Equally critical issues are intensifying international competition, the increasing impacts of the global economy, decreasing profit margins, reduced government funding and fewer public-private partnerships, lack of productivity, and industry consolidation trends. Such issues will be addressed at future think tank sessions.

"We want to provide the industry the data and the guidance it needs to develop informed strategies to deal with what appears to be an uncertain future," Aller says.

**Aller and other think tank participants identified numerous areas in which the industry's business models need to be reformulated if recovery is to proceed.**

**The major challenges include the impact of technological advances, diminishing workers' skill levels, labor shortages, credit and financing uncertainty and reduction of union influence.**



## Trenchless technology expertise critical to country's future



*Samuel Ariaratnam, Professor and Program Chair, Del E. Webb School of Construction, School of Sustainable Engineering and the Built Environment*

Modernizing public infrastructure is among the major challenges facing municipalities throughout the United States. So it's certain that a branch of construction engineering called trenchless technology is about to become a more active field.

The field involves advanced sustainable construction methods and technologies for installing, repairing or replacing underground infrastructure systems with far less disruption to roadways, businesses and homes than conventional underground construction techniques.

Arizona State University has one of the nation's trenchless technology

leaders in professor **Samuel Ariaratnam**, the chair of the construction engineering program in the Del E. Webb

School of Construction Programs, which is part of the School of Sustainable Engineering and the Built Environment. He and **Jason Lueke**, assistant professor in SSEBE, are performing several research projects focusing on underground infrastructure issues.

Ariaratnam established a student chapter of the North American Society of Trenchless Technology (NASTT) several years ago. This club focuses on the importance of educating today's students in an area of expertise that will be critical to the country's future.



*Jason Lueke, Assistant Professor, Del E. Webb School of Construction, School of Sustainable Engineering and the Built Environment*

**A horizontal directional drill rig installing an underground utility in a residential neighborhood with minimal disruption to surface features.**





# feature story

## Developing a transportation system that is smart, sustainable, and resilient



*Dr. Soyoung Ahn demonstrates new traffic simulation model.*

**Our transportation faculty members are engaged in cutting edge research to develop the next generation of transportation systems that are smart, sustainable, and resilient.**

**Safe and efficient transportation networks are vital to ensuring the economic competitiveness of a region and providing a high quality of life for residents and visitors.**

With an aging infrastructure that is being tasked to accommodate an ever-increasing amount of passenger and freight travel, transportation networks are increasingly vulnerable to shocks in an era of diminishing resources and heightened sensitivity to sustainability considerations. Ongoing research activities are aimed at developing the computational tools and theoretical models needed to better plan, operate, and design multimodal transportation networks under a wide range of system conditions and geographical contexts.

New computational model systems capable of simulating the daily travel patterns of individual residents in a region have been developed and applied to assess the traffic, energy, and air quality impacts of new light rail alignments, changes in fuel prices, and extreme events. Using new theories that explain how drivers behave in different traffic conditions, researchers are developing more accurate computer models that can better predict congestion and prevent bottlenecks before they occur. These models have been further extended to develop decision support systems capable of identifying locations that are prone to high crash occurrence, providing the ability to take preventive measures before safety is compromised.

A number of research activities are underway to analyze the economic and environmental efficacy of implementing a high speed rail network in the nation. Researchers are conducting life cycle analysis of high speed rail systems, forecasting ridership on proposed corridors, and assessing the energy and air quality impacts within a sustainability framework.

*Dr. Ram Pendyala and a group of students collect traffic data needed to develop new computer models.*



## How do hybrid and plug-in hybrid electric vehicles stack up against gasoline-powered cars?



*Mikhail Chester, Assistant Professor  
School of Sustainable Engineering and the Built Environment*

Given currently available technologies, hybrid and plug-in hybrid vehicles with small battery packs win out over conventional gasoline-powered and all-electric automobiles with large battery packs.

That's according to recent research by **Mikhail Chester**, assistant professor in the School of Sustainable Engineering and the Built Environment and colleagues at Carnegie Mellon University and the RAND Corporation. Chester and his partners determined the total costs of travel for each kind of vehicle. In addition to purchase, maintenance, and operation costs,

their life-cycle cost valuation includes human health impacts, environmental impacts and oil displacement benefits.

In the average electricity mix, their results show that small battery pack vehicles produce lower total costs than other vehicles. The study includes assessment of life-cycle considerations that include manufacturing, electricity generation, and vehicle operation in numerous counties throughout the United States.

It's an important finding considering the use of government incentives to encourage consumers to opt for alternative-fuel vehicles in the effort to reduce dependency on oil and reduce polluting emissions. The team's research results show that the American Recovery and Reinvestment Act of 2009, which provides a tax credit of up to \$7,500 for up to 200,000 vehicles, might produce more benefit if directed at hybrids or plug-ins with small battery packs.

"It's possible that in the future plug-in vehicles with large battery packs might offer the largest benefits at competitive costs if the right factors fall into place, including sufficiently low-cost batteries, high gasoline prices, low emission electricity and long battery life," Chester says. "But such a future is not certain, and in the near term HEVs and plug-in vehicles with small battery packs provide more emissions benefits and oil displacement benefits per dollar spent."



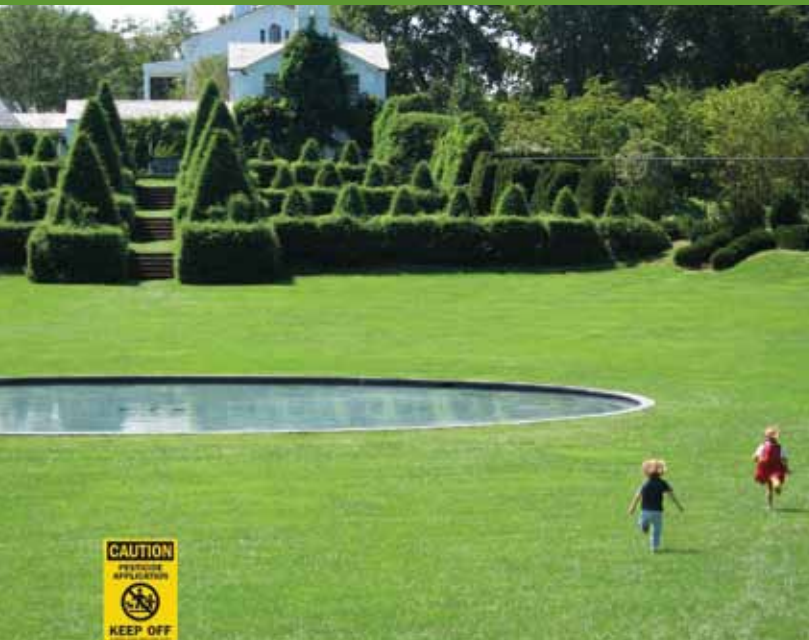
**An ASU engineer helps determine the most cost-effective and environment-friendly options among conventional gasoline-powered automobiles and newer alternative-fuel vehicles.**



## feature story

# Chemicals used to fight pests may affect human development

An arsenal of chemicals is used to effectively battle noxious pests. The costs to human health from pesticide exposure, however, have not received adequate scientific attention.



*Rolf Halden, Professor, School of Sustainable Engineering and the Built Environment, Co-Director Center for Health Information and Research, Associate Director, Swette Center for Environmental Biotechnology at Biodesign Institute*

**Rolf Halden**, a researcher at Arizona State University's Biodesign Institute and School of Sustainable Engineering and the Built Environment, joined forces with key collaborators from other major research institutions, to study two particularly pervasive pesticides, examining their levels in utero and the effects of these chemicals on newborns. The group's research – the first of its kind to examine the health implications of two leading pesticides during fetal development – recently appeared in the journal *Environmental Science & Technology*.

Due to the widespread use of pesticides, humans are exposed to an assortment of these

chemicals throughout their lives. Chlordane and permethrin, two common chemicals, are the focus of Halden's multi-institutional team involving Arizona State University, Johns Hopkins University, the National Cancer Institute and Emory University.

Chlordane, having been identified as a likely human carcinogen, was banned from use in 1988. It remains a human health issue long after its discontinued use, however, as it is known to persist in the environment along with other such organohalide chemicals. Halden stresses: "Chlordane is just one of many mass produced organohalides that are detectable in the U.S. environment, where they cause ecological and human health concerns, due to their inherent persistence, toxicity and strong tendency to bioaccumulate in living organisms, including humans."

Permethrin, known as a pyrethroid insecticide, doesn't share chlordane's long-term persistence in the environment, but is nevertheless of serious health concern. It is one of the most broadly used pesticides today—applied for commercial and residential insect control, for food and feed crops, on clothing and as part of mosquito abatement programs.

The health effects from environmental contaminants like chlordane and permethrin are a matter of growing concern, particularly during sensitive stages of fetal development. Halden notes that the human immune system is vulnerable to changes caused by such chemicals. White blood cells including lymphocytes (T and B cells), natural killer (NK) cells and monocytes, which can mature into macrophages and migrate to other tissues, are all part of the complex fabric of immunity.

# Morals and machines



*Braden Allenby  
Lincoln Professor of  
Engineering and Ethics  
Professor of Law  
Distinguished Sustainability  
Scientist, GIOS  
Director, Center for Earth  
Systems Engineering and  
Management*

According to **Brad Allenby**, professor in SSEBE and associate director of the Lincoln Center for Ethics, we're already behind the curve in developing laws, policies and guidelines to deal with issues and controversies sure to arise as the robotics explosion potentially spawns a more interwoven techno-human world.

Technological advances are making it feasible that robots could become inextricably intertwined in most aspects of society – health care, transportation, personal security, national defense, law enforcement, even childcare, government and the economy.

Robot scientists are incorporating technology with humans in ways that could threaten cultural and ethical ideas. Allenby has written his views in a

book review titled "Morals and machines" in Nature magazine.

"Robot Ethics: The Ethical and Social Implications of Robotics," is an anthology edited by two philosophers and a computer scientist that presents various experts' perspectives on the complex questions that are in need of answers as robots expand their reach into daily life.

Allenby provides a guide to challenges addressed by the book's contributors, noting how the authors offer the value of sometimes sharply differing views on how to address those challenges.

## Among interesting questions pondered:

**Should robots be able to understand the laws governing warfare before being deployed in military actions?**

**Should they not be trusted in roles as caregivers unless they can be given ability to understand human emotion?**

**Robot scientists are incorporating technology with humans in ways that could threaten cultural and ethical ideas.**





# feature story

## Can water disinfection be sustained without chemicals?



*An atomic Absorption Spectrophotometer is used to measure metal concentrations in water.*

**Peter Fox, professor in the School of Sustainable Engineering and the Built Environment, has been conducting research on physical water treatment processes that may sustain water treatment without the addition of chemicals.**



*Peter Fox, Professor,  
School of Sustainable  
Engineering and the Built  
Environment*

The focus of this research has been on technologies that can prevent the formation of scale in both domestic and industrial water systems. Technologies such as template assisted crystallization can effectively prevent scale formation in many systems. Developing a fundamental understanding of how these technologies work is critical to applying them for different water qualities. Research is also being done on antimicrobial coatings and materials to determine if disinfection can be sustained without chemical addition.

**Peter Fox** continues to do research on water reuse and groundwater recharge systems. Relationships between sub-surface travel and surface area have been developed and demonstrate why most groundwater recharge systems in the world provide similar levels of treatment. When travel times are used as a design parameter, the sub-surface surface does not vary significantly for common types of aquifer materials. Present research is attempting to experimentally verify the modeling results.

Recently, Fox completed a study where over 2000 compounds in the FDA data base were analyzed to determine their potential as future contaminants in indirect potable reuse systems. The study concluded that in the future, the majority of new pharmaceutical compounds will be produced by biotechnology and should not be as persistent as synthetic compounds.

*The unit processes laboratory is used to conduct pilot-scale simulations of treatment processes.*





# Integrating technologies for water resource predictions in the southwest US



*Principal Investigator:  
Enrique Vivoni, Associate  
Professor*

Arid and semiarid hydrosystems in the southwest U.S. are susceptible to a wide array of environmental challenges related to human activities. For example, anthropogenic climate change will significantly increase air temperatures in the next century,

in the range of 1 to 4 °C, with a myriad of consequences on the natural and built environment. These pending changes require that engineering systems related to water supply and quality be retrofitted or altered in their operation to meet changing conditions and growing demands.

**Enrique Vivoni**, associate professor in the School of Sustainable Engineering and the Built Environment and the School of Earth and Space Exploration, is undertaking several, multi-year efforts to study arid and semiarid watersheds in Arizona, New Mexico and Sonora, Mexico. These studies involve the integration of technologies for environmental monitoring, imaging and prediction in rangeland basins that act as a source of water and sediment as well as mediate energy and carbon exchanges with the atmosphere. Technologies include distributed sensor networks, unmanned aerial vehicles and high performance computer modeling.

By combining field and modeling methods, the team is laying the ground work to study the impacts of climate change and land use alterations on the water resources of the southwest US. These predictions will help society better assess future water availability in the natural and built environment and how engineering methods may help in adapting to impending changes.



*SSEBE Graduate student Nolie Pierini installs wiring for soil moisture and temperature sensors and a rain gauge at the Santa Rita Experimental Range near Green Valley, Arizona (Photo: Tom Story)*

A team of graduate students in SSEBE, including **Ryan Templeton** (MS, 2011), **Nolie Pierini** and **Cody Anderson**, are comparing the water, energy and carbon dynamics in two rangelands:

- Sonoran Desert savanna near Green Valley, Arizona and
- Chihuahuan Desert shrubland near Las Cruces, New Mexico.

Initial efforts have revealed the spatial and temporal variability of rainfall, soil moisture and runoff within each watershed.

Importantly, the team has found that using the distributed soil moisture measurements improved the estimation of evapotranspiration, the major water loss in these hydrosystems, as a residual of the watershed water balance.

## Hoque Geotechnical Laboratory at ASU

Premier facility for testing unsaturated soils



Edward Kavazanjian,  
Professor



Sandra Houston, Professor



Claudia Zapata, Assistant  
Professor

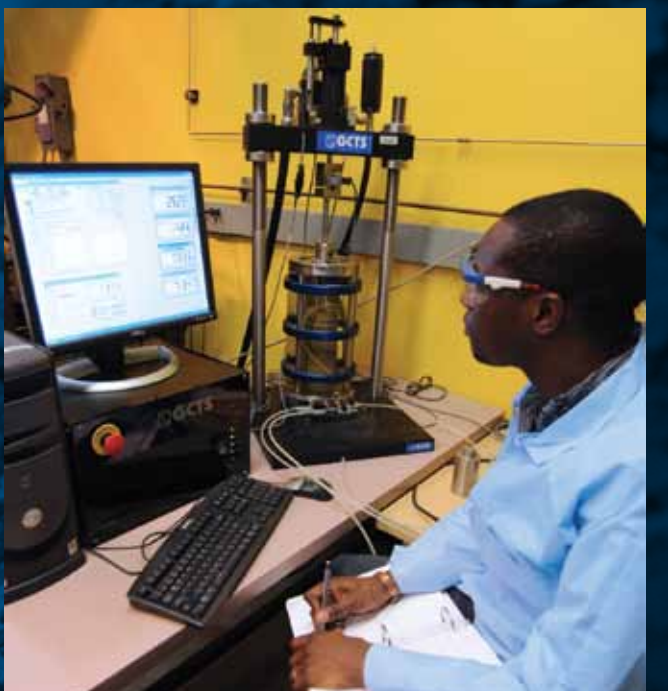
Current research in geotechnical engineering at ASU includes both experimental work and numerical analysis. ASU continues to remain one of the leading institutions for studying the engineering behavior of unsaturated soils and the ISTB-2 laboratory is one of the premier facilities in the world for testing of unsaturated soils.

Current unsaturated soils research includes a continued focus on the effect of environmental conditions on the performance of pavement and airfield subgrades based on stochastic approaches as well research on cracking of soils and the properties of cracked and expansive soils. This work is supported by the National

Science Foundation (NSF) and the Transportation Research Board and includes analytical components as well as experimental work. NSF-sponsored research on development of student-centered lecture and laboratory modules on the basic principles of unsaturated soils theory is also being conducted.

Ongoing experimental work in the **Enamul and Mahmuda Hoque Geotechnical Laboratory** includes NSF supported work on the post-liquefaction behavior of soils and on microbial induced carbonate precipitation for soil improvement. The work on post-liquefaction behavior of soil is a collaborative project with Stanford University and Bucknell University and will take ASU students to U.C. Davis for testing on the shared-use dynamic geotechnical facility there.

Ongoing ASU geotechnical research also includes collaborative work with the U.C. San Diego and industrial partner Geosyntec Consultants on numerical analysis of the integrity of geosynthetic elements of waste containment systems subject to extreme loads under the NSF GOALI (Grant Opportunities for Academic Liaison with Industry) program.



Soil-Water Characteristic Curve Testing in the  
Unsaturated Soil Mechanics Laboratory

Consolidated undrained triaxial testing in the  
Hoque Geotechnical Laboratory





## Bioengineering



*Bruce Rittmann  
Regents' Professor, School of Sustainable  
Engineering and the Built Environment, Ira A. Fulton  
Schools of Engineering  
Director, Swette Center for Environmental  
Biotechnology, The Biodesign Institute  
Distinguished Sustainability Scientist, Global  
Institute of Sustainability*

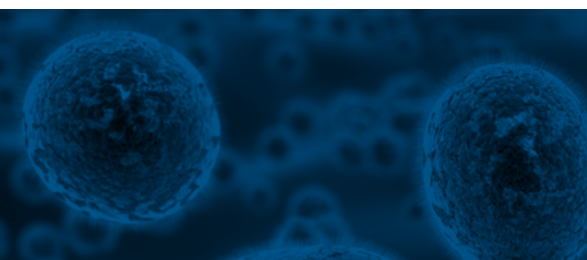
The team at the Swette Center is working at the forefront of engineering and science endeavors to “manage microbial communities” in ways that could provide more sustainable processes to produce energy from renewable sources, clean up pollution and keep water supplies uncontaminated.

Rittmann reports on progress in his field – for instance, development of a “photosynthetic factory” that uses photosynthesis to make bacteria into fuel molecules, resulting in what could become a viable nonpolluting alternative to burning fossil fuels.



*PhD student Anca Delgado takes a sample from her anaerobic enrichments active in biodegrading trichloroethene.*

*PhD student Chao Zhou takes a sample of cyanobacteria from a photobioreactor used to generate feedstock to replace petroleum.*





## Detecting parasites and viruses in water



Morteza Abbaszadegan, Professor, School of Sustainable Engineering and the Built Environment and Director of the NSF Water & Environmental Technology Center.

### NSF Water & Environmental Technology Center

Director: Morteza Abbaszadegan

The laboratory is fully equipped to perform a variety of applied microbiological analyzes such as detection of parasites and viruses by cell culture and advanced molecular techniques; *Cryptosporidium* and *Giardia* viability and disinfection studies; evaluation of water treatment efficiencies including coagulation and filtration performance; coliform regrowth, biological treatment, microbial disinfection studies and the detection of *Giardia* and *Cryptosporidium* in water samples using microscopy.

There are three segregated areas for the cell culture assays, PCR sample preparation and epifluorescence microscopy. The cell culture and PCR laboratories are equipped with UV lights and positively pressured with Hepa filtration systems to significantly reduce any chance of sample contamination. The microbiology research laboratories are well equipped for the performance of all areas of water microbiology, pathogen monitoring and molecular tracking of microbes.

**The Environmental Microbiology Laboratory at Arizona State University occupies over 1,400 square feet and is operating under the direct supervision of Dr. Morteza Abbaszadegan.**



# Wink Ames, a legacy of support



Bill Ames



Wink Ames

Arizona State University's construction programs are considered among the very best in the nation, based in no small part to the contributions and support of William "Wink" Ames, founder of Minard-Ames Insurance Group.

Mr. Ames' advocacy for the construction industry and education has spanned generations. Wink grew up in the construction industry and has continued the legacy of his father, Bill Ames. Wink is a particularly strong advocate for students. He has taught graduate and undergraduate classes for decades. He spent 20 years on the Industry Advisory Council, and has served Fulton Engineering as the first chair of the recruitment and recognition committee. During this time, he launched the inaugural construction recognition banquet, which will celebrate its 22nd anniversary this year.

He has also encouraged greater diversity in the industry. Wink has endowed scholarships to help recruit African-American and female students to the construction programs at ASU. In the fall of 2007, ASU honored Wink with its Alumni Appreciation award at Homecoming.

Recently, the Beavers Charitable Trust, a nonprofit organization that promotes education and assists students pursuing careers in the heavy construction industry, established a Heavy Construction Chair endowment in honor of Bill Ames and Wink Ames at ASU. Wink and friends have given to the endowment, providing Fulton Engineering a strong tool to attract more high-caliber faculty.

The holder of the chair will have a leading role in developing a bachelor of science program in construction engineering, as well as strengthening the existing heavy construction emphasis in the Del E. Webb School of Construction programs.

"I have received a lot of fulfillment from serving the construction industry," says Ames. "I hope I will leave it in a better place. It has been a fun ride."



*We see a huge need for expertise in heavy construction to help the nation build new infrastructure and rebuild old infrastructure in the next two decades," says G. Edward Gibson, director of the School of Sustainable Engineering and the Built Environment.*

**The Beavers Heavy Construction Chair in honor of Bill Ames and Wink Ames was established by the Trustees of the Beavers Charitable Trust in recognition of the Ames' family multigenerational support and advocacy of the construction industry in California and Arizona.**

## alumni in the news

# Campuses benefit from construction school alum's creative spirit



**Emerson Ward**, a 2006 graduate of ASU's Del E. Webb School of Construction, has been involved in more than a dozen construction and renovation projects on the university's campuses through his job as a project manager for Core Construction Services.

Since graduating in 2006 with a bachelor's degree in construction management from the Del E. Webb School of Construction Programs, Ward has been helping to build many of the university's newer facilities and renovate older ones.

He's now in his sixth year with CORE Construction Services of Arizona, Inc. – a company that does more than \$700 million a year in business in seven states – where he rose to a project manager position in just two years.

Ward has managed more than a dozen projects at ASU – large and small jobs adding up to more than \$60 million in construction work – including a new and extensively modernized university police department facility on the Tempe campus and renovations of Sun Devil Stadium and the Memorial Union student center.

That list also includes renovations of the Psychology Main Building and labs for the Department of Psychology's Behavioral Neuroscience Program. In addition he's worked on projects to fortify seven buildings with new roofing systems, enabling them to support arrays of photovoltaic panels as part of the university's efforts to use solar energy to power more of its facilities.

Elsewhere in the community he's been involved in construction for the Deer Valley Unified School District, Gilbert School District and the city of Apache Junction. He also recently helped complete a new police and courts center in Tolleson.

Current ASU projects include reroofing of the Wells Fargo Arena, the Student Services building and Interdisciplinary Building B on the Tempe campus, plus construction of a student housing facility and dining hall on the university's Polytechnic Campus.

**"For me, it's great to be part of making the campuses better**

**places," Ward says.**

**"I'm very passionate about it, because the quality of what we're building will contribute to the aesthetics of the campuses and create environments conducive to students' success, and it will all have an impact on the character and progress of ASU far into the future."**



ASU grad **Rob Jeter**, now an engineer for the **U.S. Department of State**, was part of an emergency-response effort after the devastating 2010 earthquake in Haiti. Jeter who earned the class of **1997 Outstanding Senior Award** in what was then ASU's Department of Civil and Environmental Engineering now works for the Office of Design and Engineering in the U.S. Department of State's Bureau of Overseas Building Operations. Jeter has also worked in Afghanistan, Pakistan, Yemen, Mauritania, Chile, Finland, Lebanon, England and Germany. In all he's worked in at least 20 different countries since joining the State Department early in 2008.

**Lori Ann Stevens**, LEED AP, recently joined the San Diego business unit of **Turner Construction Company** as a **Senior Project Manager**. Stevens will be responsible for managing projects within Turner's Special Projects Division, as well as assisting with Business Development. She received her bachelor's degree in Construction Management from ASU and her master's degree in Civil Engineering from San Diego State University.

Two alumni of ASU's Del E. Webb School of Construction Programs were recently honored by the Construction Financial Management Association (CFMA) for their contributions to the industry. The national organization's **2011 Arizona Construction Industry Pioneer Award** was given to **Ron Rodgers**, former president of J.B. Rodgers Mechanical Contractors. He graduated from ASU with a degree in construction management in 1977. CFMA's **2011 Arizona Construction Executive of the Year Award** went to **Mike Fann**, president of Fann Contracting. Fann earned his construction management degree in 1980.

**Lieutenant Colonel Corey Spencer**, a graduate of the DEWSC construction management masters' program, became **Deputy Commander of the U.S. Army Corps of Engineers (USACE) Afghanistan Engineer District-South (AED-South)**, based on Kandahar Airfield, on August 6, 2011. As Deputy Commander, Lieutenant Colonel Spencer assists in leading AED-South in its design and construction programs and directs the day-to-day operations of the District's staff. He was commissioned into the U.S. Army Corps of Engineers following graduation from Colorado State University in 1991 where he earned a bachelor's degree in construction management. He holds a master's degree in construction management from Arizona State University. His military education includes the Engineer Officer Basic and Advance Courses, and the Command and General Staff College.

**John W. Nicklow**, PhD, earned his doctorate in civil engineering from Arizona State University in 1998 under the supervision of Professor Larry Mays, has been named Southern Illinois University Carbondale's new provost and vice chancellor for academic affairs. Nicklow joined the faculty as an assistant professor in the Department of Civil and Environmental Engineering in 1998. He became an associate professor in 2003 and was promoted to professor in 2007. He served as acting chair of the department from July through December 2005, and was interim associate dean of the College of Engineering from 2006 to 2007. He became permanent associate dean in 2007.

**Debra Larson**, PhD, earned her doctorate in civil engineering in 1994 from Arizona State University, has been named dean of the College of Engineering at California Polytechnic State University. Larson joined Cal Poly Engineering as dean on August 22, 2011. She previously served as the associate vice provost at Northern Arizona University (NAU) in Flagstaff, AZ where she led and managed the business systems, student and curricula processes, and policies of academic affairs. She holds the academic rank of professor; is a licensed professional engineer in the states of Oregon and Arizona; is well-known for her activities in engineering education; and serves as an ABET EAC evaluator. Larson's academic career began in 1994, after an earlier career as a civil and structural engineer working in manufacturing, product development and sales, and consulting.

**Kent Dibble** (BSCE 1975 Arizona State University), president of Dibble Engineering, has been recognized by the **American Public Works Association** for achieving **Lifetime Membership Status** after having served 30 years in the organization. **Dibble Engineering** and Caruso, Turley and Scott were the engineers on the new Chandler City Hall. This project is listed in the Engineering News-Record (ENR) Best of the Best top projects of 2011 in the government/public building category.

*Leon Begay, Ulysses Rivera and Elsa Landero prepare for a presentation. Mr. Begay is a civil engineering major, Mr. Rivera is studying broadcast journalism and Ms. Landero is majoring in justice studies.*





## Morteza Abbaszadegan, PhD

Professor, PhD, University of Arizona  
Morteza.Abbaszadegan@asu.edu  
(480) 965-3868

**Research Expertise:** Contemporary water quality issues related to health-related water microbiology including microbial detection methodologies, pathogens inactivation and removal mechanisms during water treatment processes, water quality in water distribution systems and microbial monitoring of source waters. He has developed many new techniques for the detection of viruses, bacteria and parasites in water environments

Abbaszadegan is a professor of environmental microbiology/engineering and founding director of the National Science Foundation (NSF) Water & Environmental Technology (WET) Center at Arizona State University. The NSF Center provides a platform to address issues as diverse as water quality by capitalizing the strengths of partner organizations. He joined the school in 1999 after spending more than six years as a microbiology research manager in private industry. He developed three different courses for the program including an Environmental Microbiology course (CEE 467/567) for engineers.

### Honors and Distinctions:

Abbaszadegan has authored more than 100 research manuscripts, book chapters and reports in the area of environmental microbiology and engineering. He serves as Editor of the Journal of Water and Health, an IWA publishing, and successfully established NSF Centers in Water Quality and Environmental Technology at ASU. He has also served on several national and international committees and currently is the Chair, Section 9510, Detection of Enteric Viruses for Standard Methods. Abbaszadegan received the Outstanding Research Team Award, University of Arizona.

### Selected Publications:

Abbaszadegan, M., A. Alum, H. Abbaszadegan and V. Stout. 2011. Cell Surface Display of Poliovirus Receptor on E. coli: A Novel Method for Concentrating Viral Particles in Water. *Applied and Environmental Microbiology*. 77:5141-5148.  
Mayer, B., H. Ryu, and M. Abbaszadegan. 2008. Treatability of U.S. EPA Contaminant Candidate List viruses: removal of coxsackievirus and echovirus using enhanced coagulation. *Environmental Science & Technology*. 42:18:6890-6896.  
Abbaszadegan, M., M. LeChevallier, and C. Gerba. 2003. Occurrence of viruses in US ground waters. *J. Am Water Works Assoc.* 95:107-120.



## Soyoung Ahn, PhD

Assistant Professor, PhD, University of California-Berkeley  
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**Research Expertise:** Traffic flow analysis and modeling, safety effects of traffic flow features, congestion management and mitigation, applications of intelligent transportation systems for mobility and safety improvements

### Honors and Distinctions:

Ahn is a recipient of the National Science Foundation CAREER award (2012-2017). Ahn serves as a member of the Traffic Flow Theory and Characteristics committee of the Transportation Research Board and a member of the Editorial Board of Transportation Research Part B.

### Selected Publications:

Duret, A., Ahn, S., Buisson, C., 2012. Lane-flow distribution on a three-lane freeway: Empirical observation and model implementation. *Forthcoming in Transportation Research Part C*.  
Ahn, S., Vadlamani, S., Laval, J., 2012. A method to account for non-steady state conditions in measuring traffic hysteresis. *Forthcoming in Transportation Research Part C*.  
Zheng, Z., Ahn, S., Chen, D., Laval, J., 2011. Freeway traffic oscillations: microscopic analysis of formations and propagations using wavelet transform. *Transportation Research Part B* 45 (9), 1378-1388.  
Duret, A., Ahn, S., Buisson, C., 2011. Passing rates to measure relaxation and impact of lane-changing in queue. *Computer-Aided Civil and Infrastructure Engineering* 26 (4), 285-297.  
Bar-Gera, H., Ahn, S., 2010. Empirical macroscopic evaluation of freeway merge-ratios. *Transportation Research Part C* 18, 457-470.  
Zheng, Z., Ahn, S., Monsere, C.M., 2010. Impact of traffic oscillations on freeway crash occurrences. *Accident Analysis and Prevention* 42 (2), 626-636.  
Ahn, S., Cassidy, M. J., 2007. Freeway traffic oscillations and vehicle lane-change maneuvers. In: R.E. Allsop, M.G.H. Bell, B.G. Heydecker (Eds.), *17th International Symposium of Transportation and Traffic Theory*, Elsevier, Amsterdam, 691-710.  
Ahn, S., Cassidy, M. J., Laval, J., 2004. Verification of simplified car-following theory. *Transportation Research Part B* 38 (5), 431-440.



## Braden Allenby, PhD, JD

Professor, PhD, Rutgers University  
Braden.Allenby@asu.edu (480) 727-8594

**Research Expertise:** Sustainable engineering, Design for Environment, industrial ecology, engineering and applied ethics, transhumanism and emerging technologies, and earth systems engineering and management

### Honors and Distinctions:

Brad Allenby is the Lincoln Professor of Engineering and Ethics, and of Law, past President of the International Society for Industrial Ecology, ex-Chair of the AAAS Committee on Science, Engineering, and Public Policy, Chair of the IEEE Presidential Sustainability Initiative, an AAAS Fellow, an AT&T Industrial Ecology Fellow, a Batten Fellow at Darden Business School at the University of Virginia, and a Fellow of the Royal Society for the Arts, Manufactures & Commerce.

Allenby is also the founding chair of the Consortium for Emerging Technologies, Military Operations, and National Security; founding director of the Center for Earth Systems Engineering and Management; and Associate Director of the Lincoln Center for Applied Ethics.

### Selected Publications:

In the past year, Allenby has had four books published:

*Industrial Ecology and Sustainable Engineering* (with Tom Graedel, published by Pearson/Prentice-Hall);  
*The Theory and Practice of Sustainable Engineering* (published by Pearson/Prentice-Hall);  
*The Techno-Human Condition* (published by MIT Press); and  
*The Growing Gap Between Emerging Technologies and Legal/Ethical Oversight* (co-edited with Gary Marchant and Joe Herkert, published by Springer).





**Samuel Ariaratnam, PhD, PE, P.Eng.**  
Professor and Construction Engineering Program Chair, PhD, University of Illinois at Urbana-Champaign  
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**Research Expertise:** Sustainable urban underground infrastructure systems with an emphasis on horizontal directional drilling and trenchless pipe replacement

Samuel Ariaratnam is a professor in the Del E. Webb School of Construction in the School of Sustainable Engineering and the Built Environment. He received his B.A.Sc. in Civil Engineering from the University of Waterloo (Canada) and his M.S. and Ph.D. from the University of Illinois at Urbana-Champaign.

#### Honors and Distinctions:

Ariaratnam has published over 175 technical papers, holds three patents, co-authored five textbooks, and is active in numerous professional organizations.

In 2003 he was presented with the Young Civil Engineer Achievement Award from the University of Illinois at Urbana-Champaign. He is a past recipient of the John O. Bickel Award from the American Society of Civil Engineers (ASCE) and was named to the Phoenix Business Journal's prestigious "Top Forty under 40" list in 2006. Currently, he serves as the Chairman of the International Society for Trenchless Technology. Recently, Ariaratnam was named the "2012 Trenchless Technology Person-of-the-Year" by Trenchless Technology Magazine.

Ariaratnam is a registered professional engineer in the State of Arizona and the Province of Ontario (Canada).

#### Selected Publications:

Piratla, K. and S.T. Ariaratnam (2011). "Criticality Analysis of Water Distribution Pipelines", *Journal of Pipeline Systems Engineering and Practice*, ASCE, 2(3), 91-101.

Lau, S.C., M. Lu, and S.T. Ariaratnam (2010). "Applying Radial Basis Function Neural Networks to Predict Next-Cycle Production Rates in Tunneling Construction", *Tunneling and Underground Space Technology*, Elsevier Science, U.K., 25(4), 357-365.



**Howard Bashford, PhD, PE**  
Associate Professor, PhD, Brigham Young University  
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**Research Expertise:** Design of Production Systems for Construction Residential construction Residential construction issues

Howard Bashford owned and operated an engineering consulting firm for 19 years and a construction development company for 8 years before coming to DEWSC in 1991. He has been a faculty member ever since, spending two years at Brigham Young University and the remainder of the time at DEWSC.

Bashford has served as director of the graduate program since 1997. He has also worked with Drs. Walsh and Sawhney of DEWSC to develop a collaborative research program focused upon residential construction. This has led to the development of the Arizona Partnership for Advancing Technology in Homebuilding (AzPath), a partnership with five local home builders, National Science Foundation, and the US Department of Housing and Urban Development (HUD).

#### Honors and Distinctions:

Bashford is also the Director of the Housing Research Institute (HRI) at ASU. Bashford also heads the Master of Real Estate Development program at DEWSC. This accelerated program is part of a university wide trans-disciplinary degree, collaborating with the schools of design, law and business at ASU.

2003 Crescordia Award for Outstanding Excellence in Environmental Education

#### Selected Publications:

Palaniappan, S., Bashford, H.H., Fafitis, A., Li, K., Stecker, L. (2009). "Carbon emissions based on ready-mix concrete transportation: A production home building case study in the Greater Phoenix Arizona area." *Proc. Associated Schools of Construction 45th Annual International Conference*, University of Florida, Gainesville, Florida, April 1 - 4, 2009.

Bashford, J., Sawhney, Felt, J. (2007) "Benchmarking the Contribution of Labor in Production Homebuilding." *Proceedings, ASCE 2007 Construction Research Congress*, Grand Bahamas Island, May 6 - 8, 2007.



**Allan Chasey, PhD, PE**  
Associate Professor, PhD, Virginia Tech  
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**Research Expertise:** Construction process for high-technology, controlled environment facilities

Allan Chasey, an associate professor in the Del E. Webb School of Construction, received his Ph.D. from Virginia Tech, M.S. in Engineering Management from the Air Force Institute of Technology, and B.S. in Civil Engineering from ASU. He is also the Sundt Professor of Alternate Delivery and Sustainable Development.

He is Director of CREATE, a research consortium of companies representing the Advanced Technology Facility design and construction industry.

He is currently developing the Building Information Modeling (BIM) curriculum for the School of Construction.

#### Honors and Distinctions:

Chasey is a registered Professional Civil Engineer in Arizona, an OSHA Construction Outreach Trainer, and a LEED AP. He is a member of the American Society of Civil Engineers (ASCE), the Association for the Advancement of Cost Engineering (AACE), International Society of Pharmaceutical Engineers (ISPE), and the Semiconductor Environmental, Safety and Health Assoc. (SESHA). He also serves as the lead of the Facilities Working Group for the Factory Integration TWG for the International Technology Roadmap for Semiconductors (ITRS).

#### Selected Publications:

Chasey, A., Maddex, W., Bansal, A., "A Comparison of Public-Private Partnerships and Traditional Procurement Methods in North American Highway Construction," *Transportation Research Board Annual Conference*, Washington, DC, January, 2012.

Root, S., and Chasey, A., "Achieving Sustainability through Building Information Modeling Workflow", *International Conference on Sustainable Design and Construction (ICSDC) 2011*, Kansas City, KS, 23-25 Mar, 2011, pp 344-351.

Chasey, A., "Building Information Modeling: improving facility project delivery" *Photovoltaics International*, Eighth Ed., May 2010, pp 14-19.



## Mikhail Chester, PhD

Assistant Professor, PhD, University of California, Berkeley  
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**Research Expertise:** Energy and environmental assessment of large infrastructure systems, transportation systems and cities, evaluating life-cycle and supply chain effects and their associated human and environmental impacts

Mikhail Chester joined the School of Sustainable Engineering and the Built Environment in 2011. He has an affiliate appointment with the School of Sustainability. Previously, he was a post-doctoral researcher at the University of California, Berkeley, and guest researcher at Lawrence Berkeley National Laboratory.

Chester's research expands the assessment boundaries of complex systems to understand comprehensive effects of policies and decisions, including infrastructure interdependencies. Ultimately, he is interested in determining the external control and damage costs of these impacts and how internalization of these costs may inform behavioral economics for sustainable policies and decisions. Chester applied these research interests as a consultant for the National Research Council of the National Academies' Hidden Costs of Energy study.

Chester's transportation life-cycle assessment research project website with up-to-date results and in-depth methodological documentation is available at [www.sustainable-transportation.com](http://www.sustainable-transportation.com).

## Honors and Distinctions:

Chester's Environmental Assessment of Passenger Transportation Should Include Infrastructure and Supply Chains publication was recently selected as one of the journals top 3 manuscripts for 2009.

## Selected Publications:

Yeganah Mashayekh, Paulina Jaramillo, Mikhail Chester, Chris Hendrickson, and Chris Weber, 2011, Costs of Automobile Air Emissions in U.S. Metropolitan Areas, Transportation Research Record, 2233, Transportation Research Board.

Roger Sathre, Mikhail Chester, Jennifer Cain, and Eric Masanet, 2011, A Framework for Environmental Assessment of Carbon Capture and Storage Systems, Energy, In Press.

Jeremy Michalek, Mikhail Chester, Paulina Jaramillo, Constantine Samaras, C.S. Norman Shiau, and Lester Lave, 2011, Valuation of Plug-in Vehicle Life-cycle Air Emissions and Oil Displacement Benefits, Proceedings of the National Academy of Sciences (PNAS), 108 (40).



## James Ernzen, PhD, PE

Associate Professor, PhD, University of Texas at Austin  
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**Research Expertise:** Concrete materials and concrete production and construction operations, integrated project delivery methods

Jim Ernzen is an associate professor and Director of the Concrete Industry Management program at the Del E. Webb School of Construction.

Ernzen joined ASU in 1996 after 22 years as a construction manager, project engineer, materials researcher, and civil engineering educator in the Army Corps of Engineers.

Ernzen serves as the Academic Co-chairperson of the Project Delivery Methods Task Force sponsored by the Alliance for Construction Excellence where he teaches a graduate course, conducts seminars, and performs research in integrated project delivery methods.

In 2004, he brought a new curriculum program to the School of Construction entitled Concrete Industry Management. This program has been funded with over \$1.4M from the concrete industry and represents a significant industry-academia partnership that has brought increased national and international recognition to DEWSC and ASU. He currently serves as Director of the Concrete Industry Management program.

## Honors and Distinctions:

In 2001 he was selected to participate on a joint FHWA-AASHTO sponsored International Scanning Tour to investigate innovative contracting methods in Europe. In 2002 he was designated as one of 75 charter Fellows of the Design Build Institute of America (DBIA). He is a member of several committees with the Transportation Research Board as well as DBIA and the American Concrete Institute. He has been recognized by American Institute of Steel Constructors, with their "Distinguished Service Award". From 2005-2009 he was director of the Del E. Webb School.

## Selected Publications:

Performance in the Project Trailer: A Partnering Evaluation Tool: a Partnering Evaluation Tool" Ginger Murdough, Debra Drecksell, G. Sharp and J.J. Ernzen, Transportation Research Record, No. 1994 Transportation Research Board, National Research Council, August, 2007 pp 26-34.

"Design Build in the Desert; Innovative Contracting in a Rural Setting" D.Brisk, J. Livingston, D. Drecksell, and J.J. Ernzen, Transportation Research Record, Transportation Research Board, National Research Council, August, 2003.



## Apostolos Fafitis, PhD, PE

Associate Professor, PhD, Northwestern University  
Fafitis@asu.edu (480) 965-3389

**Research Expertise:** Constitutive modeling of brittle materials, elasto-plastic behavior of structures, time dependent nonlinear structural analysis and seismic isolation of structures

Apostolos Fafitis joined the faculty at ASU in 1984. He received his Ph.D. from Northwestern University. Prior to joining ASU, Fafitis worked for 15 years for various structural consulting companies in South Africa, Greece and the USA. He has been involved in the analysis and design of reinforced and prestressed concrete bridges and buildings.

Fafitis' teaching interests include: statics and strength of materials, reinforced and prestressed concrete design, nonlinear structural analysis and dynamics of structures.

Research interests: constitutive modeling of brittle materials, elasto-plastic behavior of structures, time dependent nonlinear structural analysis and seismic isolation of structures.

## Selected Publications:

Yang, S., Fafitis, A. and Wiesel, A. (2011). "Analytic Study on the Structural Behavior of the String Bed in a Tennis Racket", Journal of Mechanical Science and Technology, Vol.25, no.10, pp. 2615-2621

Yang, L., Zhu, H. and Fafitis, A. (2011). "Curvature Ductility of Singly Reinforced Crumb Rubber Concrete Beams", Journal of Advanced Materials Research, Vols. 168-170, pp. 2111-2115

Yue, J., Fafitis, A. and Qian, J. (2010). "On the Kinematic Coupling of 1D and 3D Finite Elements: A Structural Model", Interaction and Multiscale Mechanics, Vol. 3, No. 2, pp 192-211.

Rong, B., Chen, Z. and Fafitis, A. (2009) "Axial Compression Stability of a Crisscross Section Column Composed of Concrete-Filled Square Steel Tubes", J. of Mech. Of Mater. and Struct. Vol. 4, pp. 101-113.

Attard, T. and Fafitis, A. (2007) "Optimal Seismic Analysis of Frames", Engineering Structures Parts 1 and 11, 29(8), pp.1990-2000.

Fafitis, A. (2005) "Nonlinear truss Analysis by One Matrix Inversion", ASCE J. of Str.Eng. Vol. 131, pp. 701-705.

Fafitis, A. (2001) "An Application of Green's Theorem in the Analysis of Reinforced Concrete Sections Under Biaxial Stress", ASCE J. of Str. Eng. Vol. 127, pp. 840-846.





## Peter Fox, PhD, PE

Professor, PhD, University of Illinois  
Peter.fox@asu.edu (480) 965-1734

**Research Expertise:** Water reuse, biological treatment processes and brine disposal/desalination

Peter Fox has been a faculty member in Civil, Environmental and Sustainable Engineering at ASU for 20 years. He received his Ph.D. in Environmental Engineering from the University of Illinois in 1989, his M.S. in Environmental Engineering from the University of Illinois in 1985 and his B.S. in Chemical Engineering with Honors from the University of Illinois.

His professional interests are primarily in water reuse, biological treatment processes and brine disposal/desalination. He has focused his work on natural treatment systems, groundwater recharge and indirect potable water reuse for the last fifteen years.

### Honors and Distinctions:

Fox served on the National Academy of Science ad-hoc committee that published the National Research Council report entitled "Prospects for Managed Underground Storage of Recoverable Water" in 2008. He also authored the groundwater recharge chapter in the Metcalf and Eddy textbook on water reuse. In addition, Fox was an executive committee member for the development of the national roadmap for desalination and water purification.

Fox was awarded the Quentin Mees Research Award from the AzWater Association in 1991, 1994, 1997 and 2003. He was awarded for his special contribution to students at Arizona State University in 1997 and 1998.

### Selected Publications:

Nalinakumari, B., Cha, W and P. Fox (2010), Effects of Primary Substrate Concentration On N-nitrosodimethylamine (NDMA) During Simulated Aquifer Recharge, *ASCE Journal of Environmental Engineering*, 136:4, 373-380.

Mohammadesmaeili, F., Kabiri-Badr, M., Abbaszadegan, M. and P. Fox. (2010). By-Product Recovery as Part of Zero Liquid Discharge with Reclaimed Water. *Water Environment Research*, 82:4 576-584

Lim, S.J., Kim, S.H. and P. Fox (2009). Biological Nutrient and Organic Removal from Meat Packing Wastewater with a Unique Sequence of Suspended Growth and Fixed-Film Reactors. *Water Sci. and Tech.* 60:12 3189-3197.

Makam, R. and P. Fox (2009), An Analysis of Surface Area and Travel Time Relationships During Sub-Surface Flow, *Water Environment Research* 81:11, 2337-2443.



## Matthew Fraser, PhD

Associate Professor, PhD, Caltech  
Matthew.fraser@asu.edu (480) 965-3489

**Research Expertise:** Urban air quality, sources and control of air pollution, sustainability analysis of energy systems

Matt Fraser is the Executive Director of the Quantum Energy and Sustainable Solar Technologies Engineering Research Center (QESST ERC), as well as an Associate Professor in the School of Sustainable Engineering and the Built Environment and the School of Sustainability at ASU. The QESST ERC is an interdisciplinary team consisting of multiple universities, world-renowned companies, and leading PV entrepreneurs focused on building a strategic partnership to generate innovative solutions to sustainable electricity generation. More details at [www.qesst.org](http://www.qesst.org).

As a faculty member, Fraser directs his own research projects on urban air quality. His research focuses on using organic speciation and receptor modeling to apportion ambient pollutants to their original source. To tackle this complex problem, Fraser's research group has been involved in field monitoring programs, source characterization studies, emission inventory preparation, and analytical method and instrument development projects. Fraser teaches courses related to energy and the environment, renewable energy, and the scientific basis for global environmental change.

Fraser received his Bachelors of Science in Chemical Engineering from Carnegie Mellon University and his Masters and Ph.D. in Environmental Engineering Science from Caltech.

### Honors and Distinctions:

Presenter "University/City Partnerships in Promoting Urban Sustainability" presentation at the White House Office of Science and Technology Policy Workshop on Energy Efficiency, March 2011, Washington DC.

Panelist at the American Association for the Advancement of Science and Brookings Institute Forum on "Eco-Engineering: Building Sustainable Cities", Washington DC, October 2011.

### Selected Publications:

Danadurail, S.; Chellam, S.; Lee, C-Y; Fraser, M. P. (2011) "Trace elemental analysis of airborne particulate matter using dynamic reaction cell ICP-MS: Application to monitoring episodic industrial emission events", *Analytica Chimica Acta* 686, 40-49.

Jia, Y.; Fraser, M. P. (2011) "Saccharides in Ambient Particulate Matter and Two Biologically Derived Sources – Soil and Primary Biological Aerosol Particles", *Environ. Sci. Tech.*, 45, 930-936.



## G. Edward (Edd) Gibson, Jr., PhD, PE, NAC

Professor and Director of the School, Sunstate Chair of Construction Management and Engineering, PhD, Auburn University  
GEdwardGibsonJr@asu.edu (480) 965-7972

**Research Expertise:** Front end planning, alternative project delivery methods, risk management, dispute resolution

Edd Gibson joined ASU and the Del E. Webb School of Construction in August 2009 as its programs chair. He was named director of the School of Sustainable Engineering and the Built Environment in 2011.

Gibson has led over \$9 million in funded research during his career from sponsors such as NSF, Construction Industry Institute, NRC, Alfred P. Sloan Foundation, and others. He has taught on the university level for over 20 years and has delivered more than 180 short courses to industry, receiving awards for university and continuing education instruction.

Gibson has several years of industry employment experience and is a licensed professional engineer in Texas.

### Honors & Distinctions:

Elected as Fellow in ASCE, 2006. Elected National Academy of Construction (NAC), 2005. U.S. Dept. of State, Fulbright Senior Specialist Grant to Norway, 2004. Construction Industry Institute's Researcher of the Year Award, 2004. National Society of Professional Engineers, Sustaining Universities Program, Outstanding Engineering Educator Award, 2002.

### Selected Publications:

Gibson, G. E.(coordinating author), Podesta, T., Carlsson, E., Mitrosca, R. (2010). Project Definition Rating Index, Infrastructure Projects, The Construction Industry Institute, Instructor's Manual, Education Module 268-2, 128 pp., August.

Shrestha, P., O'Connor, J., and Gibson, G. E., "Performance Comparison of Large Design Build and Design Bid Build Highway Projects", *ASCE Journal of Construction Engineering and Management*, accepted for publication, 2011.

Le, T., Caldas, C. H., Gibson, G. E., and Thole, M. (2009) "A Method for Assessing Project Scope and Managing Risk in Highway Construction." *ASCE Journal of Construction Engineering and Management*, 135(9), (September 2009), 900-910.

Le, T., Caldas, C. H., Gibson, G. E., and Thole, M. (2009) "A Method for Assessing Project Scope and Managing Risk in Highway Construction." *ASCE Journal of Construction Engineering and Management*, 135(9), (September 2009), 900-910.



## Rolf Halden, PhD, PE

Professor, PhD, University of Minnesota  
halden@asu.edu (480) 727-0893

**Research Expertise:** Environmental biotechnology, wastewater treatment, green chemistry and public health, impact of anthropogenic activities on environmental quality and human health

Rolf Halden is Professor in SSEBE, Interim Co-Director of the Center for Health Information and Research, and Associate Director of the Swette Center for Environmental Biotechnology at ASU's Biodesign Institute. Halden has led over \$7.5M in funded research during his career at Lawrence Livermore National Laboratory, Johns Hopkins University and ASU, with sponsors including the NIH, EPA, DOD and DOE. He has published over 100 peer-reviewed journal articles, reports, book chapters, and patents as well as over 250 conference papers and presentations. His works include a book on contaminants of emerging concern, the first map of the human cord blood proteome, and the whole genome sequence of a dioxin-degrading bacterium. The devices he developed for groundwater monitoring and remediation have sparked two startup companies and are currently being evaluated at multiple U.S. priority (Superfund) cleanup sites.

## Honors and Distinctions:

Congressional Briefing (2011); Leroy E. Burney Lecturer, Johns Hopkins School of Public Health (2011); Biodesign Impact Accelerator Program, Selected Startup Company, ASU (2010); Award for Research Excellence, Arizona BioIndustry Association's BIOFEST 2010, Nominee and Finalist (2010); Invited Member of the NRC Committee of the National Academies (2006-07); Food and Drug Administration's Nonprescription Drugs Advisory Committee (2005); Governor-appointed Maryland State Water Quality Advisory Committee Member (2003-05); Faculty Innovation Award, Johns Hopkins University (2002); Two Recognition Awards, Lawrence Livermore National Laboratory (2000).

## Selected Publications:

McClellan K. and R. U. Halden.\* 2010. Pharmaceuticals and Personal Care Products in Archived U.S. Biosolids from the 2001 EPA National Sewage Sludge Survey. *Water Res.* 44(2):658-668.  
Halden, R. U.\* 2010. Plastics and Health Risks. *Annual Reviews of Public Health.* 31:179-194.  
Halden, R. U.\* and D. H. Paull. 2005. Co-Occurrence of Triclocarban and Triclosan in U.S. Water Resources. *Environ. Sci. Technol.* 39(6):1420-1426.



## Keith Hjelmstad, PhD

Professor, PhD, University of California, Berkeley  
keith.hjelmstad@asu.edu (480) 316-5988

**Research Expertise:** Computational mechanics, earthquake engineering, stability of structures, optimization, structural identification, nondestructive evaluation of large structures, and numerical simulation of complex structures

Keith Hjelmstad is Professor of Structural Engineering in the School of Sustainable Engineering and the Built Environment (SSEBE) in the Ira A. Fulton Schools of Engineering at Arizona State University.

Hjelmstad previously served as University Vice President and Dean of the College of Technology and Innovation at ASU. As the Dean he was responsible for the applied science and mathematics, engineering, engineering technology, cognitive science and engineering, and technological entrepreneurship and innovation management programs. As University Vice President, he served on the University leadership team of ASU and he championed further academic development of programs, activities and community relations for the Polytechnic campus.

## Honors and Distinctions:

Prior to coming to ASU Hjelmstad was on the faculty at the University of Illinois at Urbana-Champaign for 25 years where he was a professor, associate dean of academic affairs, and a member of the Science Steering Committee of the Center for Simulation of Advanced Rockets. As a professor, he was recognized for his excellence in advising and teaching.

Hjelmstad is the author of the book *Fundamentals of Structural Mechanics* (Springer, 2/e). He is a member of several professional associations for engineers and serves as associate editor of the *Journal of Constructional Steel Research* and the *ASCE Journal of Structural Engineering*.

## Selected Publications:

Nakshatrala, K. B., A. Prakash, and K. D. Hjelmstad. 2009. On dual Schur domain decomposition method for linear first-order transient problems. *Journal of Computational Physics.* 228. 7957-7985.  
Haikal, G. and K. D. Hjelmstad. 2010. An enriched discontinuous Galerkin formulation for the coupling of non-conforming meshes. *Finite Elements in Analysis and Design.* 46(6). 496-503.  
Cochran, K. B., R. H. Dodds, and K. D. Hjelmstad. 2011. The role of strain ratcheting and mesh refinement in finite element analyses of plasticity induced crack closure. *International Journal of Fatigue.* 33(9). 1205-1220.



## Sandra Houston, PhD, PE

Professor, PhD, University of California, Berkeley  
sandra.houston@asu.edu (480) 965-2790

**Research Expertise:** Advancement of methodologies for dealing with arid region problem soils, particularly collapsible and expansive soils

Sandra Houston is a long-standing member of the Civil, Environmental and Sustainable Engineering faculty at ASU and former chair of the department. Her primary area of expertise is geotechnical engineering. Houston's contributions to the field of geotechnical engineering focus on unsaturated soils, including in particular advancement of methodologies for dealing with arid region problem soils, particularly collapsible and expansive soils. She is the regular instructor of undergraduate and graduate level foundation engineering classes and teaches a graduate level course on Unsaturated Soil Mechanics.

A heavy emphasis on the advancement of unsaturated soil mechanics into the practice of geotechnical engineering is evident by her professional service activities, research, and publications.

## Honors and Distinctions:

Houston has a long history of leadership in professional society organizations, particularly through participation in the American Society of Civil Engineers (ASCE), the Geo-Institute of ASCE, and the International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE).

She is a recipient of the William H. Wisely American Civil Engineer Award, and serves as the chair of the Unsaturated Soils Committee of the Geo-Institute of ASCE, as a member of the ISSMGE Committee on Unsaturated Soils, and as chair of the ASCE Committee on Diversity and Inclusion.

## Selected Publications:

Static and Dynamic Behavior of Hydro-Collapsible Soils (2011), Elkady, T., Houston, S., and Houston, W., *ASTM Geotechnical Testing J.* Vol. 34, September. DOI: 10.1520/GTJ103576.  
Effects of Testing Procedures on the Laboratory Determination of Swell Pressure of Expansive Soils (2011), Singhal, S., Houston, S., and Houston, W., *ASTM Geotechnical Testing J.* Vol. 34, September. DOI: 0.1520/GTJ10370.  
Houston, S., Dye, H., Zapata, C., Walsh, K., and Houston, W. (2011). Study of Expansive Soils and Residential Foundations on Expansive Soils in Arizona, *J. Of Constructed Facilities*, ASCE, Jan/Feb, pp 335-346.





## Paul C. Johnson, PhD, PE

Dean, Ira A. Fulton Schools of Engineering  
Professor, School of Sustainable Engineering and  
the Built Environment, PhD, Princeton University  
Paul.C.Johnson@asu.edu (480) 965-9235

**Research Expertise:** Soil and groundwater remediation and risk assessment, specifically, the design, monitoring and optimization of soil and groundwater remediation systems and the monitoring and modeling of exposure pathways

Paul Johnson is the dean of the Ira A. Fulton Schools of Engineering at Arizona State University and a professor in the School of Sustainable Engineering and the Built Environment. Johnson has been a faculty member at ASU since 1994 and has previously served as the university's associate vice president for research, and as associate dean for research and as interim dean and executive dean for the Fulton Schools of Engineering. Prior to joining ASU, he was a senior research engineer at the Shell Oil/Shell Chemical Westhollow Technology Center in Houston, Texas.

### Honors and Distinctions:

His research group recently received the 2011 Strategic Environmental Research and Development Program (SERDP) Project of the Year Award for their study of chemical vapor intrusion to homes overlying chlorinated-solvent impacted aquifers.

From 2003 through 2011, Johnson served as the editor for the National Ground Water Association's journal, Ground Water Monitoring and Remediation. In 2011, he received the Keith E. Anderson Award from the association for outstanding contributions to the NGWA's Scientists and Engineers division.

In 2011, Johnson was named the Outstanding Educator of the Year by the Arizona Professional Engineers Society.

Johnson is currently serving on the National Research Council Committee on Future Options of the Nation's Subsurface Remediation Effort.

### Selected Publications:

Kingston, J.T., P.R. Dahlen, and P.C. Johnson. 2010. State of the Practice Review of In Situ Thermal Technologies. Ground Water Monitoring and Remediation. 30 (4). 64 – 72.

Johnson, P.C., C.L. Bruce, K.D. Miller. 2010. A Practical Approach to the Design, Monitoring, and Optimization of In Situ MTBE Aerobic Biobarriers. Ground Water Monitoring and Remediation. 30 (1). 58-66.

Luo, H., P. Dahlen, P.C. Johnson, T. Peargin, and T. Creamer. 2009. Spatial Variability of Soil-Gas Concentrations near and beneath a Building Overlying Shallow Petroleum Hydrocarbon-Impacted Soils. Ground Water Monitoring and Remediation. 29 (1). 81-91.



## Kamil Kaloush, PhD, PE

Associate Professor, PhD, Arizona State University  
Kamil.kaloush@asu.edu (480) 965-5509

**Research Expertise:** Pavements, materials characterization, crumb rubber applications, urban heat island

Kamil Kaloush is an associate professor in the School of Sustainable Engineering and the Built Environment, affiliate faculty in the School of Sustainability, and Director of the National Center of Excellence on SMART Innovations ([www.asuSMART.com](http://www.asuSMART.com)). He holds a Ph.D. degree specializing in pavements and materials from Arizona State University. He is a registered Professional Engineer, and has over 25 years of experience in pavement research and management services. His areas of expertise include pavement materials design, thermal properties, advanced laboratory testing, field performance evaluation, and pavement management systems.

### Honors and Distinctions:

Kaloush is a member of several professional organizations and has over 100 publications in his field. He is the chair of the Transportation Research Board subcommittee on Pavement Materials and the Urban Climate; a member of the Civil Engineering Examination Committee, National Council of Examiners for Engineering and Surveying; Vice Chair of the Technical Advisory Board of the Rubber Pavements Association, and Advisor for the ASU-ASCE student chapter.

Kaloush is also an associate editor of the Journal of Materials in Civil Engineering. In 2009 he was the recipient of the Community Service Award presented by the joint ASU, ADOT, Industry and Local Government Pavements/Materials Conference committee.

### Selected Publications:

J. Stempihar, T. Pourshams-Manzouri, K. Kaloush, and M. C. Rodezno. "Porous Asphalt Pavement Temperature Effects for Urban Heat Island Analysis". Journal of the Transportation Research Board, (In press, 2012). Washington, D. C.

A. Zborowski and K. Kaloush, "A Fracture Energy Approach to Model the Thermal Cracking Performance of Asphalt Rubber Mixtures". Road Materials and Pavements Design Journal, Volume 12 Issue 2/2011, pp 377-395, Lavoisier, 2011.

P. White, J. Golden, K. Biligiri, and K. Kaloush. "Impacts of Alternative Pavement Designs on Climate Change", Journal of Resources, Conservation and Recycling, Elsevier, the Netherlands, Volume 54, Issue 11, pp. 776-782, September 2010.



## Dean T. Kashiwagi, PhD, PE

Fulbright Professor, PhD, Arizona State University  
Director, Performance Based Studies Research Group  
Dean.Kashiwagi@asu.edu (480) 965-4273

**Research Expertise:** Supply chain best value procurement risk minimization

Dean Kashiwagi is the worldwide expert in optimizing the delivery of construction and other services using performance information. His structures/processes simultaneously minimize project/risk management functions up to 90%, increased vendor profit as much as 100%, increased performance to 98%, and decrease costs.

His Performance Information Procurement System (PIPS) and Performance Information Risk Management System (PIRMS) is licensed by the U.S. Army Medical Command and the General Services Administration. Kashiwagi has generated over \$12M in grants over 18 years, and has successfully run over 975 project tests, delivering over \$4.7B of construction and other services.

### Honors and Distinctions:

Kashiwagi is an accomplished author with over 206 refereed conference and journal papers and is a registered engineer in eight states. His research has been recognized by the industry and recently awarded the 2011 Silver Award for Procurement Excellence by NASPO. He was the 2009 International Facility Management Association Educator of the Year. In 2005, he was the recipient of the CoreNet Global Innovation of the Year Award for the research being tested at Harvard University and in 2001 his work received the Pono Technology Award for research work and results in the State of Hawaii. Kashiwagi's research has also expanded to Finland, Netherlands, Africa, and Malaysia.

### Selected Publications:

Kashiwagi, D. (2011) "Best Value Procurement / Performance Information Procurement System Development." Journal for the Advancement of Performance Information and Value, Vol. 3 (1), pp. 12-45.

Mselle, P., Kashiwagi, J., Kashiwagi, D., Adeyemi, A. (2011) "Risk Management: A New Project Management Perspective." Journal of Civil Engineering and Architecture, Vol. 5 (6), pp. 505-512.

Kashiwagi, D. (2011) "Case Study: Performance Information Procurement System (PIPS) in the Netherlands." Malaysian Construction Research Journal (MCRJ), Construction Research Institute of Malaysia (CREAM), Vol. 8 (1), pp. 1-17.



## Edward Kavazanjian, Jr., PhD, PE, GE

Professor, PhD, University of California, Berkeley  
edkavy@asu.edu (480) 727-8566

**Research Expertise:** Geotechnical earthquake engineering, waste containment, mechanical properties of municipal solid waste

Edward Kavazanjian is a geotechnical engineer with 20 years of experience in engineering practice and 14 years of university teaching and research experience. His research and teaching interests include geotechnical earthquake engineering, analysis and design of waste containment systems, and the emerging area of biogeotechnical engineering.

### Honors and Distinctions:

Kavazanjian has been honored by the American Society of Civil Engineers (ASCE) with the 2011 Karl Terzaghi Award for outstanding contributions to knowledge in soil mechanics. He has also received the 2010 Thomas A. Middlebrooks award for his paper on "Shear Strength of Municipal Solid Waste" and the 2009 Ralph B. Peck Award for outstanding contributions to the geotechnical engineering profession through the publication of thoughtful, carefully researched case histories on landfill engineering from ASCE. In 2009 he was selected as Engineering Educator of the Year by the Phoenix chapter of the National Society of Professional Engineers.

Kavazanjian is co-author of the Federal Highway Administration guidance document on LRFD Seismic Analysis and Design for Transportation Geotechnical Features and Structural Foundations and the Environmental Protection Agency guidance document on RCRA Subtitle D (258) Seismic Design Guidance for Municipal Solid Waste Landfill Facilities. He is Past President of the Geo-Institute of ASCE and sits on the National Research Council Board of Earth Sciences and Resources, where he serves as chair of the standing Committee on Geological and Geotechnical Engineering.

### Selected Publications:

Bray, J.D., Zekkos, D., Kavazanjian, E. Jr., Athanasopoulos G. A., and Reimer, M. (2009) "Shear Strength of Municipal Solid Waste," ASCE JGGE, Vol. 135, No. 6 (June), pp. 709-722.

Kavazanjian, E. Jr., Arab, M.G., and Matasovic, N. (2011) "Seismic Analysis of Heap Leach Pad Liner Systems," 5th International Conference on Earthquake Geotechnical Engineering, Santiago, Chile.

Kavazanjian, E., Jr. (2010) "Sustainable Landfilling," Proceedings, 6th International Conference on Environmental Geotechnics, New Delhi, India, Tata McGraw Hill Education Private Limited, pp. 113-124.



## Rosa Krajmalnik-Brown, PhD

Assistant Professor, PhD, Georgia Institute of Technology  
Dr.Rosy@asu.edu (480) 727-7574

**Research Expertise:** Biotransformation and fate of environmental contaminants, bioremediation of soil, sediments, and groundwater, the use of microbial systems for bioenergy production with an emphasis on environmental applications of molecular microbial ecology

Rosa Krajmalnik-Brown is an assistant professor in Civil, Environmental & Sustainable Engineering (CESE). Before joining CESE she was a postdoctoral researcher at Biodesign working in the Center for Environmental Biotechnology. She received her B.S. (1996) in Industrial Biochemical Engineering from Autonomous Metropolitan University in Mexico City and her M.S. (2000) and Ph.D. (2005) in Environmental Engineering from Georgia Institute of Technology.

Another area of research where she applies her molecular microbial ecology expertise is the human intestinal microbial ecology and its relationship to obesity.

Her research has been published in Proceedings of the National Academy of Science, Applied and Environmental Microbiology, Environmental Science and Technology, FEMS Microbiology Ecology and Environmental Microbiology.

### Honors and Distinctions:

NSF CAREER award 2011-2015

AEES Outstanding 2003 Ph.D. Candidate in Environmental Engineering

Fulbright Scholar 1997-2000

Best GPA of 1996 class "Medalla al Merito Universitario" UAM-I Mexico

### Selected Publications:

Ziv-El M., Delgado A. G., Yao Y, Kang D.W., Halden Rolf U., Krajmalnik-Brown R. 2011 Development and characterization of DehaloR<sup>2</sup>, a novel anaerobic microbial consortium performing rapid dechlorination of TCE to ethene. Applied Microbiology and Biotechnology.92:1063–1071.

E.I. Garcia-Peña<sup>1</sup>\*, P. Parameswaran<sup>2</sup>, J. Miceli<sup>2</sup>, M. Canul Chan<sup>1</sup> and R. Krajmalnik-Brown<sup>2</sup>. 2011 Anaerobic digestion and co-digestion process of vegetable and fruit residues: Process and microbial ecology. Bioresource Technology, 102: 9447–9455.

Torres C.I., Ramakrishna S., Chiu C.A., Muto K, Westerhoff P., Krajmalnik-Brown R. 2011 "Analysis of the Chemical and Biological Degradation of Sucralose in Synthetic Wastewater" Journal of Environmental Engineering and Science, 28 (5): 325-331.



## Amy E. Landis, PhD

Associate Professor, PhD, University of Illinois at Chicago  
Amy.Landis@asu.edu (480) 965-4028

**Research Expertise:** Industrial ecology, byproduct synergies, biofuels for bioremediation on marginal lands, biofuels, biopolymers, development of sustainability metrics, life cycle assessment

Amy E. Landis is an associate professor in the School of Sustainable Engineering and the Built Environment (SSEBE). Before joining SSEBE in January 2012, she was an assistant professor at the University of Pittsburgh's Department of Civil and Environmental Engineering.

Landis is dedicated to sustainability engineering education and outreach; she works with local high schools, after school programs, local nonprofit organizations, and museums to integrate sustainability and engineering into the undergraduate curriculum, communities, and K-12 education.

### Honors and Distinctions:

Carnegie Science Post Secondary University Educator Award (2012) and Honorable Mention (2011).

National Academy of Engineering: Nominated and selected to attend Frontiers of Engineering Education Symposium in Irvine CA (2011).

Fulbright Fellow to Switzerland (2004-2005).

### Selected Publications:

Kullapa Soratana and Amy E. Landis (2011). "Evaluating Industrial Symbiosis and Algae Cultivation from a Life Cycle Perspective." Bioresource Technology. 102 (13) pp 6892-6901.

Xue, Xiaobo and Amy E. Landis (2010). "Eutrophication potential of food consumption patterns." Environmental Science & Technology. 44 (16), pp 6450-6456.

Tabone, Michaelangelo, James Cregg, Eric J. Beckman, and Amy E. Landis (2010).

"Sustainability metrics: Life cycle assessment and green design in polymers." Environmental Science & Technology. 44 (21), p 8264-8269.

Costello, Chris, Amy E. Landis, and Mike W. Griffin (2009). "Impact of Biofuel Crop Production on the Formation of Hypoxia in the Gulf of Mexico." Environmental Science & Technology. 43 (20), pp 7985-7991.





## Jason Lueke, PhD, P.Eng.

Assistant Professor, PhD, University of Alberta  
Jason.Lueke@asu.edu (480) 965-7417

**Research Expertise:** Area of urban infrastructure management and rehabilitation, focusing on trenchless engineering and construction methodologies

Jason Lueke is an assistant professor in the Del E. Webb School of Construction (DEWSC). Prior to joining DEWSC in January 2009, he worked for 8 years as a civil infrastructure engineer in the contracting and consulting industries. He received his Ph.D. in Civil Engineering, specializing in Construction Engineering and Management, from the University of Alberta, Edmonton, in 2005. His research focuses on underground construction, buried infrastructure, and trenchless construction methods. He has published over 50 journals and conference papers in the area of trenchless design and construction.

Lueke has been involved professionally in numerous infrastructure projects including water distribution, and wastewater and storm water management; undertaking design services, feasibility studies, value engineering, risk mitigation, and tendering services; and has specialized expertise in trenchless construction methods including horizontal directional drilling, pipe relining, pipe bursting, case boring, and tunneling. Lueke is currently researching photogrammetric methods to provide quality assurance and to record as-builds; investigating behavior of buried plastic pipe installed by open trench and directional drilling beneath rivers; and researching methods to sustainably rehabilitate water distribution networks.

### Honors and Distinctions:

2011 EPICS Gold Faculty Mentor of the Year, 2010 Trent Ralston Award from the North American Society for Trenchless Technology (NASTT) for excellence in the early stages of his career.

### Selected Publications:

Lueke, J.S., and S.T. Ariaratnam (2006), Numerical Characterization of Surface Heave Associated with Horizontal Directional Drilling, Tunneling and Underground Space Technology, v21, n1, January, p106-117.

Lueke, J.S., and S.T. Ariaratnam (2005), Surface Heave Mechanisms in Horizontal Directional Drilling, Journal of Construction Engineering and Management ASCE, v131, No.5, p540-547.

Ariaratnam, S.T., J.S. Lueke, and E. Anderson (2004), Reducing Risks in Unfavorable Ground Conditions During Horizontal Directional Drilling, Practice Periodical on Structural Design and Construction, ASCE, Vol. 6, No. 1 pp.25-34.



## Michael S. Mamlouk, PhD, PE, FASCE

Professor and CESE Program Chair  
PhD, Purdue University  
Mamlouk@asu.edu (480) 965-2892

**Research Expertise:** Highway materials, pavement design and management, pavement evaluation, pavement maintenance and rehabilitation

Michael Mamlouk has over 30 years of research and teaching experience in the field of pavement/ materials engineering. Prior to joining ASU, he worked at the State University of New York at Buffalo for 5 years. He received his Ph.D. degree from Purdue University in 1979.

He is currently working as the Co-PI of an \$840,000 project funded by the National Cooperative Highway Research Program (NCHRP) dealing with the endurance limit of hot-mix asphalt.

### Honors and Distinctions:

Mamlouk has published numerous technical papers and is actively involved in professional societies such as ASCE, AAPT, TRB and ASTM. He is the main author of the "Materials for Civil and Construction Engineers" textbook, which has been used by over 135 engineering schools worldwide. He has worked as a consultant and expert witness to many highway agencies and local industry and is a professional engineer in the State of Arizona. He received the community service award at the Arizona Pavements/Materials Conference in 2010.

### Selected Publications:

Rational Modeling of Tertiary Flow for Asphalt Mixtures, Record No. 2001, J. of the Transp. Research Board, Washington, DC, 2007.  
Effect of Vehicle Class Distribution on Predicted Performance of Flexible Pavement Using the AASHTO MEPDG METHOD, Int'l J. of Pavements, Vol. 8, No. 1-2-3, 2009.

Necessary Assessment of Use of State Pavement Management System Data in Mechanistic-Empirical Pavement Design Guide Calibration Process, Record No. 2153, Vol. 1, J. of the Transp. Research Board, Washington, DC, 2010.

Calibration of the AASHTO MEPDG for Designing Flexible Pavements in Arizona Conditions, Int'l J. of Pavements, Vol. 9, No. 1-2-3, 2010.

Temperature Gradient and Curling Stresses in Concrete Pavement with and without Open Graded Friction Course, Vol. 137, No. 10, ASCE, J. of Transp. Eng., Oct. 2011.

Data Collection to Support Implementation of the Mechanistic-Empirical Pavement Design Guide for County Roads, Record No. 2225, J. of the Transp. Research Board, Washington, DC, 2011.



## Larry Mays, PhD, PE, PH, D.WRE, FASCE

Professor, PhD, University of Illinois  
Mays@asu.edu (480) 965-2524

**Research Expertise:** Hydrosystems engineering

Larry Mays has been a professor at Arizona State University since 1989, and former chair of the department from 1989-1996. He started his academic career at the University of Texas at Austin in 1976, and became Director of the Center for Research in Water Resources in 1988.

His areas of research interest are in the study of ancient water systems and the use of optimization methods for the design and operation of water infrastructure systems to promote water resources sustainability. His research has been published in over 90 refereed journal publications, over 100 proceeding papers, over 70 chapters in books he edited and another invited 8 book chapters. He has mentored over 30 Ph.D. students.

Mays is the author, co-author, or editor-in-chief of over 22 books including the well-known textbooks Water Resources Engineering; Groundwater Hydrology; Applied Hydrology; Hydrosystems Engineering and Management; and handbooks including Water Resources Handbook; Water Distribution Systems Handbook; Hydraulic Design Handbook; and others.

Among his honors is a distinguished alumnus award from the University of Illinois at Champaign-Urbana. He is a Diplomate of the American Academy of Water Resources Engineers, a Fellow of ASCE and IWRA, and a past president of UCOWR.

### Selected Publications:

Integrated Urban Water Management in Arid and Semi-Arid Regions, L.W. Mays, Editor-in-Chief and author of six chapters, for UNESCO-IHP, published by Taylor and Francis, London, 2009.

Ancient Water Technologies, L.W. Mays, Editor-in-Chief, Springer, Netherlands, Copyright 2010.

Water Resources Engineering, 2nd Edition, John Wiley and Sons, Inc., Copyright 2011.

Ground and Surface Water Hydrology, John Wiley and Sons, Inc., Copyright 2012.

Applied Hydrology, V.T. Chow, D.R. Maidment, and L.W. Mays, McGraw-Hill, 1988.

Hydrosystems Engineering and Management, L.W. Mays and Y.K. Tung, McGraw-Hill, 1992.

Water Distribution Systems Handbook, L.W. Mays, Editor-in-Chief, McGraw-Hill Book Co, 2000.

Groundwater Hydrology, 3rd edition, with D.K. Todd, John Wiley & Sons, Inc. 2005.



## Barzin Mobasher, PhD, PE

Professor, PhD, Northwestern University  
Barzin@asu.edu (480) 965-0141

**Research Expertise:** Mechanics of composite materials, development of new construction materials, durability of building materials, and performance based specifications

Barzin Mobasher, who joined the Ira A. Fulton Schools of Engineering faculty in 1991, has been involved in research and teaching in the area of cement and concrete engineering for more than 25 years. He received his Ph.D. in 1990 from Northwestern University. His specific expertise is in the mechanics of composite materials, the development of new construction materials and the durability of building materials.

Mobasher has published more than 150 peer-reviewed research papers on the mechanics and durability of concrete technology, and has delivered more than 120 technical presentations worldwide.

### Honors and Distinctions:

In 2009 Mobasher was selected as a Fellow of the American Concrete Institute (ACI), one of the most prominent organizations in the concrete technology field.

He is a member of the American Society of Civil Engineers (ASCE) and American Ceramic Society and member of the International Editorial Board of Computers and Concrete.

Dr. Mobasher, is the author of a recent book "Mechanics of Fiber and Textile Reinforced Cement Composites", Taylor and Francis Group, CRC press, Sept, 2011, 451 pp.

His paper titled: Mechanical behaviour of strain-hardening cement-based composites (SHCC) under low and high tensile strain rates was selected among the top three papers in 2011 by the Japan Concrete Institute.

### Selected Publications:

Soranakom, C., and Mobasher, B., "Modeling of tension stiffening in reinforced cement composites: Part I -Theoretical Modeling, Materials and Structures, (2010) 43:1217-1230 DOI 10.1617/s11527-010-9594-8, 2010.

Zhu, D., Mobasher, B., Rajan, S.D., "Dynamic Tensile Testing of Kevlar 49® Fabrics," ASCE Journal of Materials in Civil Engineering, Vol. 23, No. 3, March 1, 2011. DOI: 10.1061/(ASCE)MT.1943-5533.0000156.

Silva, F., Zhu, D., Mobasher, B., Toledo Filho, "Impact Behavior of Sisal Fiber Cement Composites under Flexural Load" ACI Materials Journal, V. 108, No. 2, March-April 2011, pp. 168-177.



## Narayanan Neithalath, PhD.

Associate Professor, PhD, Purdue University  
Narayanan.Neithalath@asu.edu (480) 965-6023

**Research Expertise:** Sustainable construction materials including high volume cement replacement materials for concrete, development of novel materials for desired performance levels such as pervious concretes, cement-free binder systems and lightweight aggregate concretes, and fundamental aspects of property development in conventional and novel cementitious (and cement-less or alkali activated) systems

Narayanan Neithalath is an Associate Professor in the School of Sustainable Engineering and the Built Environment at Arizona State University. He received his PhD in Civil Engineering (specializing in Concrete Materials) from Purdue University in 2004.

He is also interested in transport properties of concretes, electrical impedance sensing and sensor systems for concrete, and non-invasive and non-destructive testing of concrete. He has published around 100 papers in peer reviewed journals and conference proceedings, and has received several awards for his work on novel concrete materials including the NSF CAREER award, Bengt Friberg award for outstanding paper, and PCA fellowship. (<http://faculty.engineering.asu.edu/neithalath>)

### Honors and Distinctions:

NSF CAREER Award (2008)

Bengt Friberg Award (2005) for the Best Paper by a Young Author – 8th International Conference on Concrete Pavements, Colorado Springs, CO, Portland Cement Association (PCA) Fellowship (2003) for research on Enhanced Porosity Concrete systems

Associate Editor – Journal of Materials in Civil Engineering

Member of the editorial board of Cement and Concrete Composites

### Selected Publications:

Sumanasooriya, M.S., Deo, O., and Neithalath, N., (2012). "A particle packing based methodology for material design of pervious concretes", accepted for publication in ACI Materials Journal.

Sumanasooriya, M.S., and Neithalath, N., (2011). "Pore structure features of pervious concretes proportioned for desired properties and their performance prediction", Cement and Concrete Composites, Vol. 33(8), pp. 778-787.

Jain J., and Neithalath, N., (2011). "Electrical impedance analysis based quantification of microstructural changes in concretes due to non-steady state chloride migration", Materials Chemistry and Physics, Vol. 129, pp. 569-579.



## Ram Pendyala, PhD.

Professor, PhD, University of California, Davis  
ram.pendyala@asu.edu (480) 727-9164

**Research Expertise:** Development and application of new methods for modeling and forecasting transportation demand and system performance under a wide variety of socio-economic, modal, and land use scenarios

Ram Pendyala joined ASU in 2006 after spending 12 years on the faculty at the University of South Florida. He received his Ph.D. from the University of California at Davis in 1992.

Pendyala teaches courses in transportation engineering, transportation systems analysis and modeling, and public transportation planning and design. He has conducted more than \$5 million in sponsored research over the past 20 years for a variety of agencies including Federal Highway Administration, National Science Foundation, Florida Department of Transportation, Maricopa Association of Governments, Southern California Association of Governments, and Baltimore Metropolitan Council.

### Honors and Distinctions:

Pendyala is currently Chair of the Transportation Research Board's Travel Analysis Methods Section, and Chair of the International Association for Travel Behavior Research. He has published more than 100 articles in refereed journals, books, and conference proceedings. Pendyala has mentored over 50 M.S. and Ph.D. students.

### Selected Publications:

Sener, I.N., R.M. Pendyala, and C.R. Bhat (2011) Accommodating Spatial Correlation Across Choice Alternatives in Discrete Choice Models: An Application to Modeling Residential Location Choice Behavior. Journal of Transport Geography 19(2), pp. 294-303.

Sana, B., K.C. Konduri, and R.M. Pendyala (2010) A Quantitative Analysis of the Impacts of Moving Towards a Vehicle Mileage-Based User Fee. Transportation Research Record 2187, Journal of the Transportation Research Board, pp. 29-35.

Plotz, J., K.C. Konduri, and R.M. Pendyala (2010) To What Extent Can HOV Lanes Reduce Vehicle Trips and Congestion? Exploratory Analysis Using National Statistics. Transportation Research Record 2178, Journal of the Transportation Research Board, pp. 170-176.

Eluru, N., A.R. Pinjari, R.M. Pendyala, and C.R. Bhat (2010) An Econometric Multi-Dimensional Choice Model of Activity-Travel Behavior. Transportation Letters: The International Journal of Transportation Research 2(4), pp. 217-230.



## Subramaniam (Subby) Rajan, PhD, PE

Professor and SSEBE Graduate Chair, PhD, University of Iowa  
S.Rajan@asu.edu (480) 965-1712

**Research Expertise:** Finite element based design optimization, parallel computations, constitutive material modeling

Subby Rajan's teaching and research interests include solid mechanics with emphasis on constitutive modeling, finite element analysis, design optimization and high-performance software development. Currently he is working on research projects sponsored by the Federal Aviation Administration (FAA), the Army Research Office (ARO) and local industries. These projects involve characterization of materials for blast and ballistic mitigation, development of constitutive models and computer simulations, and design optimization to reduce the weight, thickness and cost of body, vehicle and aircraft armor.

### Honors and Distinctions:

Rajan's awards include Outstanding Engineering Educator of the Year awarded during Greater Phoenix Area Engineer's Week and Top Five Percent Faculty Award from Ira A. Fulton Schools of Engineering. He is a member of the Educator Advisory Board for the KNO Corporation, Board member for the Resource Center for Global Ecohappiness and Faculty Expert for the Indo-US Collaboration for Engineering Education.

### Selected Publications:

Krishnan, K, Sockalingam, S., Bansal S. and Rajan, S.D. (2010). Numerical Simulation of Ceramic Composite Armor Subjected to Ballistic Impact, *Composites Part B*, 41, 583-593.  
Zhu, D., Mobasher, B. and Rajan, S.D. (2011). Experimental Study and Modeling of Single Yarn Pull-Out Behavior of Kevlar 49 Fabric, *Composites Part A*, 42:7, 868-879.  
Rajan, S.D. (2011). Enhanced Protection via Composite Armor: Current & Future Trends, *G3 Defence*, 3:2, 24-26.



## Bruce Rittmann, PhD, NAE

Regents' Professor, PhD, Stanford University  
Director, Swette Center for Environmental Biotechnology  
Rittmann@asu.edu (480) 727-0434

**Research Expertise:** Environmental biotechnology, or managing microorganisms to provide services to society

The services include bioremediating pollution of water and soil, and generating renewable bioenergy. This highly inter-disciplinary research links engineering fundamentals with microbial ecology, biochemistry, genetics, geochemistry, and materials.

### Honors and Distinctions:

Rittmann's awards include membership in the National Academy of Engineering (NAE), a Fellow of the AAAS and the IWA, the Huber and Freese Awards from the ASCE, and appointment as a Regents' Professor at ASU. He has more than 490 publications and is on the ISI's List of Most Highly Cited Researchers. Distinguished Member of ASCE.

### Selected Publications:

Rittmann, B. E., B. Mayer, P. Westerhoff, and M. Edwards (2011). Capturing the lost phosphorus. *Chemosphere* 84: 846-853.  
Marcus, A. K., C. I. Torres, and B. E. Rittmann (2011). Analysis of a microbial electrochemical cell using the proton condition in biofilm (PCBIOFILM) model. *Bioresources Technol.* 102: 253 – 262.  
Torres, C. I., Andrew K. Marcus, H.-S. Lee, P. Parameswaran, R. Krajmalnik-Brown, and B. E. Rittmann (2010). A kinetic perspective on extracellular electron transfer by anode-respiring bacteria. *FEMS Microb. Rev.* 34: 3 – 17.  
Rittmann, B.E. (2010). The role of biotechnology in water and wastewater treatment. *J. Environ. Engr. (ASCE)* 136: 348-353.  
Rittmann, B.E. (2008). Opportunities for renewable bioenergy using microorganisms. *Biotechnol. Bioengr.* 100: 203-212.  
Marcus, A.K., C.I. Torres, and B.E. Rittmann (2007). Conduction-based modeling of the biofilm anode of a microbial fuel cell. *Biotech. Bioengr.* 98: 1117-1182.  
Rittmann, B.E. and P.L. McCarty (2001). *Environmental Biotechnology: Principles and Applications*. McGraw-Hill Book Co., New York.



## Thomas P. Seager, PhD

Associate Professor, PhD, Clarkson University  
thomas.seager@asu.edu (480) 727-0531

**Research Expertise:** Ultra-low energy community infrastructure, ethics education and life-cycle environmental implications of single-walled carbon nanotubes in energy applications

Tom Seager joined the School of Sustainable Engineering and the Built Environment in August 2010. Seager is formerly a founding faculty member at the Golisano Institute for Sustainability at Rochester Institute of Technology and led development of their PhD curriculum in sustainability.

He works at the leading edge of an integrative, transdisciplinary approach to engineering education and research and is currently leading projects related to ultra-low energy community infrastructure, ethics education for science and engineering graduate students, and the life-cycle environmental implications of single walled carbon nanotubes in energy applications.

### Selected Publications:

Linkov I, Bates ME, Canis LJ, Seager TP, Keisler JM. 2011. A decision-directed approach for prioritizing research into the impact of nanomaterials on the environment, human health. *Nature Nanotechnology*. 6:784-787.  
Linkov I, Seager TP. 2011. Coupling multi-criteria decision analysis, life-cycle assessment and risk assessment for emerging threats. *Environmental Science & Technology*. 45(12): 5068-5074.  
Mu D, Seager TP, Rao PSC, Park J, Zhao F. 2011. A resilience perspective on biofuels production. *Integrated Environmental Assessment & Management*. 7(3):348-359.  
Canis LJ, Seager TP, Linkov I. 2010. Selecting nanomanufacturing technology using an integrated risk, life-cycle assessment and decision analytic framework. *Environmental Science & Technology*. 44:8704-8711.  
Grant GB, Seager TP, Massard G, Nies L. 2010. Information and communication technology for industrial symbiosis. *J. Industrial Ecology*. 14(5):740-753.





## **Kenneth T. Sullivan, PhD, MBA**

Assistant Professor, PhD, University of Wisconsin-Madison

Kenneth.Sullivan@asu.edu (480) 965-4213

**Research Expertise:** Performance measurement and best value concepts to increase business efficiency and to minimize risk

Kenneth Sullivan has conducted his research across the project life-cycle including design, construction, and facility management. The research is applied at both organization and project levels, including contracts, risk management, project management, and accountability systems. ASU has applied many of his concepts internally and estimates a value impact of over \$10M/year due to the realized efficiencies.

### **Honors and Distinctions:**

Sullivan has a PhD, MS, and BS in Civil and Environmental Engineering and a MBA in Real Estate and Urban Economics all from the University of Wisconsin-Madison.

Top 5% of Engineering Faculty Award 2009, Deputy Director of the PBSRG, Director of FMRI, Research Secretariat for CIB W117-Performance Measurement in Construction.

### **Selected Publications:**

Sullivan, K. and Michael, J. (2011). Performance Measurement Approach to Contracting and Delivering Design Services. *ASCE Journal of Professional Issues in Engineering Education & Practice*. 137 (4), pp 248-257.

Sullivan, K. (2011). Quality Management Programs in the Construction Industry: Best Value Compared with Other Methodologies. *ASCE Journal of Management in Engineering*. 27(4), pp 210-219.



## **Enrique R. Vivoni, PhD, PE**

Associate Professor, PhD, Massachusetts Institute of Technology

vivoni@asu.edu (480) 965-5228

**Research Expertise:** Watershed hydrology and its linkages with ecological, atmospheric and geomorphologic processes

Enrique Vivoni is well known for his research in watershed hydrology and its linkages with ecological, atmospheric and geomorphologic processes. As a surface hydrologist, he performs research in hydrometeorology, ecohydrology, geomorphology and surface-groundwater interactions. His teaching is centered on surface hydrology and techniques for numerical and field studies.

### **Honors and Distinctions:**

Vivoni is the recipient of several awards including the Presidential Early Career Award for Scientists and Engineers (2008), the U.S. Fulbright-Garcia Robles Scholarship (2009) and the Kavli Science Fellowship (2010). He is an active member of the American Geophysical Union, American Society of Civil Engineers and American Meteorological Society.

### **Selected Publications:**

Vivoni and co-authors 2008. Observed Relation between Evapotranspiration and Soil Moisture in the North American Monsoon. *Geophysical Research Letters*. 35: L22403.

Mahmood, T.H. and Vivoni, E.R. 2011. A Climate-Induced Threshold in Hydrologic Response in a Semiarid Ponderosa Pine Hillslope. *Water Resources Research*. 47: W09529.



## **Zhihua Wang, PhD**

Assistant Professor, PhD, Princeton University

zhwang@asu.edu (480) 727-9592

**Research Expertise:** Urban environment under the changing climate, including land-atmosphere interactions, subsurface heat/water transport, mitigation of urban heat island effect and the long-term sustainability of cities

Zhihua Wang is originally from Zhejiang Province of China. He spent 9 years (1997-2006) in Singapore, a small beautiful tropical island in Southeast Asia, completed his Bachelor's & Master's degrees and later worked as a researcher in Nanyang Technological University. Prior to joining ASU, he worked with Prof. Elie Bou-Zeid and Prof. Jim Smith in Environmental Engineering and Water Research (EEWR) program in Princeton University.

### **Honors and Distinctions:**

Wang is an active member of the American Meteorological Society (AMS), American Physical Society (APS), American Geophysical Union (AGU) and International Association for Urban Climate (IAUC). As a passionate and highly-motivated researcher, he has been highly productive and published more than 20 peer-reviewed papers in high impact journals and conference proceedings.

### **Selected Publications:**

Wang ZH and Bou-Zeid E. A novel approach for the estimation of soil ground heat flux. *Agricultural and Forest Meteorology* (2012).

Wang ZH, Bou-Zeid E and Smith JA. A spatially-analytical scheme for surface temperatures and conductive heat fluxes in urban canopy models. *Boundary-Layer Meteorology* (2011).

Wang ZH, Bou-Zeid E, Au SK and Smith JA. Analyzing the sensitivity of WRF's single-layer urban canopy model to parameter uncertainty using advanced Monte Carlo simulation. *Journal of Applied Meteorology and Climatology* (2011).

Wang ZH. Geometric effect of radiative heat exchange in concave structure with application to heating of steel I-sections in fire. *International Journal of Heat and Mass Transfer* (2010).



## Paul Westerhoff, PhD, PE

Professor, SSEBE, Associate Dean of Research, IAFSE, PhD, University of Colorado  
p.westerhoff@asu.edu (480) 965-2885

**Research Expertise:** Treatment and occurrence of emerging contaminants in water

Paul Westerhoff has a strong publication and research record, has garnered wide recognition for his work related to treatment and occurrence of emerging contaminants in water, and has been active in multidisciplinary research. He has lead research funded by AWWARF, USEPA, NIH, NSF and local organizations investigating reactions and fate of oxo-anions (bromate, nitrate, arsenate) during water treatment, characterization, treatment and oxidation of natural organic matter in watersheds, formation of disinfection by-products, removal of taste and odor micropollutants and fate of nanomaterials in water. He has over 120 peer reviewed journal article publications and has been involved in over 250 conference presentations. He belongs to ASCE, AWWA, AEESP, ACS, IOA, IWA, AWPCA, and IHSS and serves on numerous voluntary committees for these organizations.

### Honors and Distinctions:

Westerhoff has received several research awards including the 2005 ASCE Walter L. Huber Research Award and the 2006 WEF Paul L. Busch Award. He currently serves on the USEPA Science Advisory Board (Environmental Engineering Committee) and is Vice Chair of the WaterReuse Research Foundation Research Advisory Board.

### Selected Publications:

Benny F Pycke; Troy M Benn; Paul Westerhoff; Rolf U Halden, Strategies for quantifying C60 fullerenes in biological samples and implications for toxicological Studies, *Trends in Analytical Chemistry*, 30:1:44-57 (2011).

Upadhyay, N., Sun, Q., Allen, J.O., Westerhoff, P., Herckes, P. Synthetic Musk Emissions from Wastewater Aeration Basins, *Water Research*, 45:3: 1071-1078 (2011).

Tibaquirá, J.E., Hristovski, K.D., Westerhoff, P., Posner, J.D. Recovery and Quality of Water Produced by Commercial Fuel Cells, *Int. Journal of Hydrogen Energy*, 36:6:4022-4028 (2011).

Chao, T-C, Song, G., Hansmeier, N., Westerhoff, P., Herckes, P., Halden RU, Characterization and LC-MS/MS based quantification of hydroxylated fullerenes, *Analytical Chemistry*, 83:5:1777-1783 (2011).

Benn, T.M., Pycke, B.F.G., Herckes, P., Westerhoff, P., Halden, R.U., Evaluation of extraction methods for the quantification of aqueous fullerenes in urine, *Analytical and Bioanalytical Chemistry*, 399:4:1631-1639 (2011).



## Avi Wiesel, PhD, PE

Associate Professor and DEWSC Interim Chair  
PhD, Technion-Israel Institute of Technology  
avi.wiesel@asu.edu (480) 965-4121

**Research Expertise:** Leadership in construction management, buildability modeling, construction education

A faculty member of ASU since 1995, Avi Wiesel holds a M.Sc. degree in structural engineering and a M.Sc. and Ph.D. in building science.

Prior to becoming a professor, Wiesel held several managerial positions with construction and engineering firms in Europe and the Middle East. His activities resulted in continuous productivity improvements averaging 15% per year for the units in which he was in charge. Wiesel taught in four languages on three continents (Asia, Europe, and America) to students of all levels, ranging from vocational education to doctoral students.

Wiesel is a true interdisciplinary researcher, with interests ranging from computer modeling of human skills in construction, to engineering education, and leadership. He served as the President of the Faculty Senate in the School of Engineering and as the Chair of the Education Committee of the Technical Council on Computers and Information Technology (TCCIT) in the American Society of Civil Engineers (ASCE).

### Honors and Distinctions:

Wiesel ranks among the top 5% of best teachers in the Ira A. Fulton Schools of Engineering and is the recipient of the Outstanding Faculty Member Award. He serves as the Coordinator of Construction Graduate Studies and the Interim Chairman of the Del E. Webb School of Construction Management Programs.

### Selected Publications:

Wiesel, A, Maghiar, M, Jain, S., "Automatic sizing of wood-framing crews through BIM for training and educational purposes", Ecobuild America Conference, National Institute of Building Sciences, Washington D.C., December 5-9, 2011, pp 1-9.

Wiesel, A., Badger, W., King, C., "New Research Methods in CII" 3rd International/9th Construction Specialty Conference, Canadian Society of Civil Engineering (CSCE), Ottawa, Ontario June 14-17, 2011 pp CN-197-1-10.

Badger, W., Wiesel, A., Bopp, P., Dunn, S., "Leadership Transition and Growth", International Journal of Construction Education and Research, Vol. 6 No. 1, pp 46 – 69, 2010.



## Claudia E. Zapata, PhD

Assistant Professor, PhD, Arizona State University  
claudia.zapata@asu.edu (480) 727-8514

**Research Expertise:** Characterization and modeling of fluid flow and volume change behavior of unsaturated soils and lab/field instrumentation

Claudia Zapata received her PhD from Arizona State University in 1999. She has particularly focused on the characterization of problem soils; applications related to the behavior of pavement subgrades due to dynamic loading and environmental conditions; and the assessment of fluid flow and volume change of soils under slabs-on-ground residential foundation systems.

Zapata is currently working on three main research projects: The implementation of the Mechanistic-Empirical Pavement Design Guide for the Maricopa Department of Transportation; the study of cracked expansive clays for the National Science Foundation; and the development of an Atlas of unsaturated soil properties for the 50 states for the National Cooperative Highway Research Program.

### Honors and Distinctions:

Zapata is the author of 20 technical publications focusing on expansive soils, unsaturated soil properties predicting models, and environmental effects on pavement design. She was featured in the May/June 2009 ASCE Geotechnical Engineering magazine, Geo-Strata, as a co-author of the article entitled "Application of Unsaturated Soil Mechanics to Pavement Subgrade Design."

### Selected Publications:

Cary, C. and Zapata, C.E. (2010). Enhanced Model for Resilient Response of Soils Resulting from Seasonal Changes as Implemented in "Mechanistic-Empirical Pavement Design Guide". Transportation Research Record: Journal of the Transportation Research Board of the National Academies, No 2170, Geology and Properties of Earth Materials 2010, pp. 36-44.

Zapata, C.E., Perera, Y.Y. and Houston, W.N. (2009). Matric Suction Prediction Model in New AASHTO Mechanistic-Empirical Pavement Design Guide. Transportation Research Record: Journal of the Transportation Research Board, No. 2101, Geology and Properties of Earth Materials, pp. 53-62.

Carlson, J., Kaloush, K., Golden, J., Arab, M., and Zapata, C. (2008). Evaluation of In Situ Temperatures, Water Infiltration and Regional Feasibility of Pervious Concrete Pavements. International Journal of Pavements, Vol. 7, No. 1-2-3, pp. 96-108.

**Absar Alum, PhD**

University of Arizona  
Assistant Professor Research, Civil, Environmental  
& Sustainable Engineering  
alum@asu.edu (480) 965-6268

**Expertise:** Health related environmental microbiology, microbial pathogen survival and detection, and endocrine disrupting chemicals in water

**Thomas Attard, PhD**

Arizona State University  
Associate Research Professor  
Tom.attard@asu.edu (480) 965-5623

**Expertise:** Seismic retrofit of already damaged structures using "CarbonFlex" which is a new patent-protected strength-sustainable composite that stabilizes crack growth in damaged substrates using an energy-dissipating mechanism

**Paul Dahlen, PhD**

Arizona State University  
Assistant Research Professor, Part-time  
appointment in Civil, Environmental & Sustainable  
Engineering  
Paul.Dahlen@asu.edu (480) 965-0055

**Expertise:** Assessment and remediation of hydrocarbon impacts to soil/groundwater

**Hong Luo, PhD**

Arizona State University  
Assistant Research Professor, Civil, Environmental  
& Sustainable Engineering  
Hong.Luo@asu.edu (480) 965-0055

**Expertise:** Contaminant fate and transport in the subsurface with a focus on vapor intrusion

**Della M. Roy, PhD, NAE, WAC**

Research Professor, part-time joint appointment  
in the School of Sustainable Engineering and the  
Built Environment and the School of Mechanical,  
Aerospace, Chemical and Materials  
Della.Roy@asu.edu (818) 865-1196

Roy is also a Professor Emerita of Materials  
Science at The Pennsylvania State University.

**Expertise:** Cementitious materials, chemically  
bonded ceramics, biomaterials research and  
radioactive waste management

**Thomas Schleifer, PhD**

Assistant Research Professor, Del E. Webb School  
of Construction  
Thomas.schleifer@asu.edu (480) 965-3740

**Expertise:** Construction management



*CIM student Greg Carbajal (graduated spring 2011) and instructor Edwin Weaver  
mixing concrete in a CreteSheet in the concrete laboratory.*





**Aaron Cohen, MS**

DePaul University  
Aaron.cohen@asu.edu (480) 965-6628

Associated General Contractors (AGC) Lecturer  
Teaching focuses on courses in the heavy/  
civil concentration for the DEWSC Construction  
Management degree program.



**Kraig Knutson, PhD**

Arizona State University  
Kraig.knutson@asu.edu (480) 965-1402

Senior lecturer in the DEWSC program  
Teaching and research include historical  
construction methods, infrastructure security and  
application of industrial engineering techniques to  
construction processes.



**Christopher Lawrence, PhD**

Arizona State University  
Chris.lawrence@asu.edu (480) 965-2893

Teaching areas include engineering mechanics, civil  
engineering materials, geotechnical engineering,  
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