

AEESP Newsletter

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AEESP Newsletter Submissions

Please send news, conference announcements, job postings, letters to the editor, and other contributions to the newsletter to Laura Arias Chavez at LChavez@tntech.edu. The next newsletter will appear in June 2019.

President's Letter

BY MAYA TROTZ
University of South Florida



Dear AEESP Members,

Dr. Celina Dozier, a lecturer & research professor at Arizona State University who I met at the 2017 AEESP conference, recently sent her class an email about Dr. Martin Luther King, Jr. and Environmental Engineering. She wrote, "When Dr. King was assassinated in Memphis, Tennessee in April of 1968, he was there to support the Sanitation Workers' Strike. Carl Zimring's "Clean and White: A History of Environmental Racism in the United States," argues that, "In addition to suffering from low and inequitable pay, black sanitation workers in the city suffered from what we now call environmental racism in the form of working conditions that overwhelmingly placed the burden of health and safety dangers upon them." Dr. King's work in Memphis, as well as his dedication to changing laws that would provide better housing conditions for blacks in Chicago, could be argued to be the first seeds in the fight for environmental justice. Even now, minorities and low-income communities are disproportionately exposed to poor environmental quality."

Coincidentally, I transcribed an interview with Dr. Lilia Abron for this AEESP Newsletter. She was the first African American to receive a doctorate in chemical engineering in the US, and she is the current vice president of the American Academy of Environmental Engineers and Scientists. In the interview, she expresses her shock when she sees a flyer advertising graduate positions in sanitary engineering; growing up in the deep south, that's what she called the men who picked up garbage from her house. Little did she know that she could get paid to go to school to study such a thing. She earned her MS degree in sanitary engineering from Washington University in St. Louis in 1968, the same year as the Sanitation Worker's Strike. After completing her doctorate, she served as an Assistant Professor of Civil Engineering at Tennessee State University,

an Historically Black College and University (HBCU) located just 200 miles from Memphis.

I reviewed our newsletters from 1968 to see whether any of these issues of inequality were ever acknowledged by our profession. While I did not see any reference to the topic, Dr. Waldron M. McLellon wrote in the March 1968 newsletter of the American Association of Professors in Sanitary Engineering (AAPSE), "If the profession is to expand, I feel that increased support will be required, not only at the graduate level but at the undergraduate level also. Counseling and publicity in the high schools, summer employment and other inducements must be added to make the young aware of the field and to give them an avenue, starting from the freshman level, of approaching it." He was commenting on a previously published newsletter article, "Graduate Curricula in Water Quality Engineering and Management."

As AAPSE grew into the Association of Environmental Engineering and Science Professors (AEESP), so have our interests expanded to areas beyond sanitary engineering, to learners more diverse than those in our classrooms in 1968 and even to some beyond our current academic curtains. Getting the education part right is now seen as "The ultimate challenge for environmental engineering," according to the last chapter of the recently released consensus study report by the National Academies of Sciences, Engineering, and Medicine (NASEM), "Environmental Engineering for the 21st Century: Addressing Grand Challenges (2018)." The NASEM report urges us to integrate social and behavioral dimensions of environmental challenges within real-world contexts into undergraduate curriculum. It also emphasizes that "to create solutions that work for society, environmental engineers will need to cultivate diversity and engage collaboratively with stakeholders and other disciplines." Our field is reminded that, done properly and with meaningful institutional commitment to transformation, diversity leads to innovation and that solving real-

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world problems will help us to attract a more diverse pool of students into our profession.

Water Environment & Technology's January 2019 front page alludes to this with the title, "Strength in Numbers — Workforce diversity and sustainability." Articles within that publication on the state of the water industry highlight the fact that in many instances our engineered infrastructure (e.g. water and wastewater treatment plants) is located within communities already grappling with high unemployment and that have higher percentages of underrepresented minority populations. Investing in local human capital to fill one of the 3 million water sector jobs by 2030 not only secures economic prosperity for a utility's community, but also could make the sector's workforce more representative of the communities it serves. According to "Renewing the water sector workforce: Improving water infrastructure and creating a pipeline to opportunity," a 2018 Brookings Institution publication, that workforce is now 85% male and approximately 2/3 white. In addition to McLellon's recommendations from 1968, which still hold, WE&T authors highlight a range of existing programs that range from integrating water education from early childhood to providing opportunities to persons from the criminal justice system.

The launch of the Water Environment Federation (WEF) InFLOW (Introducing Future Leaders to Opportunities in Water) program at WEFTEC 2018 was highlighted in the last newsletter. InFLOW participant Sherika Jacobs, a senior at the University of South Florida and the University of the Virgin Islands rated a panel as the most memorable aspect of the experience. She recalled, "One professional mentioned the inequality she experienced having her first job where one of her colleagues was given all of the relevant tasks for the job while she was given insignificant tasks. Nonetheless, she persevered and is now the Commissioner of the City of Atlanta's Department of Watershed Management. After hearing the trials and tribulations that these people encountered, it motivated me even more to continue working hard to achieve my goals and make a positive difference in the world." If we are to get this education thing right today, we have to listen to testimonies like those of Commissioner Powell and do better. This is already happening in our field, and I was reminded of that on Martin Luther King Day this year when WEF Board of Trustees member Ifetayo Venner sent me a pic-

ture of Sherika Jacobs sitting at her new desk at Arcadis. Our AEESP Membership & Demographics committee is exploring a program like InFLOWS to bring graduate students underrepresented in our field to AEESP conferences with the intention of getting jobs in academia.

Given the low numbers of current AEESP faculty members who are underrepresented minorities, we might have to reach beyond our disciplines to speak to the students we wish to recruit into academia with a program like InFLOWS. We could also look to faculty who are working with communities of color to solve environmental challenges. Communities like Flint, Michigan, whose potable water quality challenges provide one of the most highly publicized real-world contexts of our time. With a current population not much greater than the sum of the student bodies of Virginia Tech and the University of Michigan, Flint's population is 57% African American, and 42% live below the poverty line. Detroit, Newark, New York, Pittsburgh, and Tampa are examples of other cities that are dealing in some way with lead levels in potable water. The most vulnerable are the poor and the underrepresented minorities, many of whom live with the oldest piping systems in their homes and can least afford mitigation costs. If we looked for our members who work or have worked with various community members in Flint, we would find articles discussing their work in publications like the New York Times, the Chronicle of Higher Education, and Mother Jones. Unfortunately, the media focus has shifted from the water situation in Flint to personal relationships gone bad. Guyanese poet Martin Carter comes to mind when considering the impact of Flint on the relationships of AEESP members. "...like a jig...shakes the loom;...like a web...is spun the pattern...all are involved!...all are consumed!" If we are to get this education thing right today, we have to cultivate an academic culture that does better.

The end of Dr. Celina Dozier's email to her students on Martin Luther King Day, is something to contemplate regularly, "Though, you may not be out on the front lines protesting any of the many injustices that are still present today, ask yourself this: As an aspiring engineer, how will I be of service to the communities that I serve and ensure that my work is equitable to all people?" I hope you consider AEESP one of your valued communities. I look forward to seeing you in Arizona at AEESP 2019.

From the Editor

Dear AEESP members,



True to her reputation as a facilitator of meaningful conversation, our president has asked me to write to you about what I hope this newsletter does for our community. It's a good request – one that gets me thinking again about what I want to accomplish, but also one that hopefully gets you thinking about what AEESP means to you and what you'd like to accomplish within and through it.

There are many academic societies that are simple collections of professors with related research areas. AEESP is much more than that. It is enlivened by its wise and selfless mentors, by the exciting work of colleagues in both academia and practice, and by the opportunity to pass on the ethics and strategies of our field to mentees who are growing up in this big AEESP family. For many of us, AEESP is a collection of friends – friends who will celebrate the birth of children together, or get excited about a data set together, or mourn the passing of one of our revered old warriors of the field together. AEESP members are also friends to science and to society, and fiercely so. Their passion for doing right by both motivates them to speak up when they see oversights in research, in policy, and in the structure of our community.

Our work has societal importance that gives it meaning and motivates us to push for progress. But sometimes it is more than just challenging; it

can be frustrating, or it can even seem impossible. We get pushback from those we are trying to teach and protect, from ornery lab equipment, and sometimes even from our own bodies, whose limits conflict with the infinite needs we see around us.

I hope that this newsletter will be an encouragement to you in those times of frustration. In every issue, we have reports of impactful papers, some in research areas that did not exist a few years ago. Perhaps your former lab mate has started a new position or written a new textbook, or a mentor or mentee of yours has won an award. Nothing beats the chance to catch up face-to-face at a conference (we have information on that, too), but it is good to see the exciting accomplishments of our field in print. Whether you work with environmental engineering and science colleagues every day or are out in the 'diaspora' like I am, an environmental engineer living in a chemical engineering world, it's easy to forget how many different types of solutions are being pursued for understanding and solving society's problems. Getting reacquainted with them through this newsletter, and being able to celebrate the successes of individual colleagues and of our field as a whole, comforts me. Collectively, we are making progress, and we are doing it with our friends. What could be better than that?

Laura H. Arias Chavez is an assistant professor in the Department of Chemical Engineering at Tennessee Tech University, a rural, public university in Cookeville, TN. Tennessee Tech has approximately 9,000 undergraduate and 1,100 graduate students and recently attained the "High Research Activity" ranking in the Carnegie Classification of Institutions of Higher Education.

AEESP Fellow Nominations Now Open

Nominations for AEESP Fellows for 2019 are open now through March 1, 2019. AEESP Fellows will be selected based on their accomplishments in environmental engineering and science research, teaching and professional service, with emphasis on service within the AEESP. Eligible nominees must have a minimum of 10 years of faculty-level membership in AEESP. It is expected that nominees will have achieved full promotion or emeritus status at their respective home institutions. Details for the electronic application requirements are available at <http://www.aeesp.org/fellows>.

North American Membrane Society (NAMS) Annual Meeting in Pittsburgh, PA: May 11-15

The North American Membrane Society (NAMS) promotes all aspects of membrane science and technology, ranging from fundamental studies of membrane material science to work on process development and applications of membrane technology in water, energy, and environmental systems. The 2019 annual meeting of the North American Membrane Society will be held in Pittsburgh, PA on May 11th to 15th. Keynote lectures will be delivered by Dr. Peter Fiske on innovation in the water sector, Dr. Rachel Segalman on the polymeric properties underlying membrane permeability and selectivity, and Dr. Tim Merkel on scale-up of membrane based carbon capture systems. Additional details on technical sessions, abstract submission (deadline February 15th), and registration are available at nams2019.org. Please note that technical sessions relevant to membrane-based water treatment processes will be held on Monday, May 13th to minimize scheduling conflicts with the 2019 AEESP conference. Please contact conference co-chair Meagan Mauter (mauter@cmu.edu) with any additional questions.

AEESP Journal Environmental Engineering Science Spotlight

Mark J. Krzmarzick (Member of the AEESP Publications Committee), Susan J. Masten (Chair of the AEESP Publications Committee), Catherine A. Peters (EES Deputy Editor), Domenico Grasso (EES Editor-in-Chief)

The Spotlight column draws attention to selected articles in *Environmental Engineering Science (EES)*, the official journal AEESP. Spotlight articles appear regularly in the journal as an Editor's Note, as well as in the AEESP Newsletter. Through publication of high-quality peer-reviewed research, the EES journal helps AEESP achieve its mission of developing and disseminating knowledge in environmental engineering and science. In this entry, we shine the spotlight on selected articles from the August 2018 issue through the November 2018 issue of EES. Congratulations to all whose work is highlighted.

Pruden, A.; Alcalde, R.E.; Alvarez, P.J.J.; Ashbolt, N.; Bischel, H.; Capiro, N.L.; Crossette, E.; Frigon, D.; Grimes, K.; Haas, C.N.; Ikuma, K.; Kappell, A.; LaPara, T.; Kimbell, L.; Li, M.; Li, X.; McNamara, P.; Seo, Y.; Sobsey, M.D.; Sozzi, E.; Navab-Daneshmand, T.; Raskin, L.; Riquelme, M.V.; Vikesland, P.; Wigginton, K.; and Zhou, Z. (2018). An environmental science and engineering framework for combating antimicrobial resistance. *Environ. Eng. Sci.* 35, 1005.

Pruden et al. (2018) reports the consensus from the workshop on antimicrobial resistance, which took place at the 2017 AEESP Biennial Conference. Recommended priorities for research and action are laid out to meet goals for better surveillance and monitoring, antimicrobial resistance characterization within environmental hotspots such as in wastewater treatment and agricultural operations, and risk modeling and assessment. Further hypothesis driven research on antimicrobial propagation and links to human health is needed, and large interdisciplinary system-level studies are recommended that focus on risk characterization to develop recommendations for mitigation strategies.

Voth-Gaeddert, L.E.; Cudney, E.A.; and Oerther, D.B. (2018). Primary factors statistically associated with diarrheal occurrences. *Environ. Eng. Sci.* 35, 836.

Although on the decrease globally, diarrhea is still a leading cause of death in developing countries. In a study by Voth-Gaeddert et al. (2018), a structural equation model was developed to correlate diarrheal occurrence rates with socioeconomic, demographic, and health practices at communities with biosand filters. The structural equation model laid out complex associations between diarrheal occurrence and causal pathways, and higher household education levels and improved water sources had the highest negative effect sizes on diarrheal occurrence.

Grant, C.A. and Hicks, A.L. (2018). Comparative life cycle assessment of milk and plant-based alternatives. *Environ. Eng. Sci.* 35, 1235.

Grant and Hicks (2018) provide a midpoint life cycle assessment (LCA) for dairy milk, almond milk, and soy milk using two functional units: liter

of milk and kg of protein. Twelve impact categories were analyzed including global warming potential, eutrophication, ecotoxicity, fossil fuel depletion, water intake, and cumulative energy demand. On a per liter basis, dairy milk had the highest impact in six of the 12 categories, but on a per kg of protein basis, almond milk had the highest impact on all 12 categories. The study not only provides valuable information on the LCA of these consumer products, but highlights how functional units used in LCA analysis can lead to different results and interpretations.

Ruybal, C.J.; Wilkin, R.T.; Rue, K.D.; McCray, J.E.; and DiGiulio, D.C. (2018). New equilibrator design for rapid detection of methane in groundwater during purging. *Environ. Eng. Sci.* 35, 897.

Oil and natural gas production poses risks of methane intrusion into groundwater used for drinking water, and real-time field measurements pose several advantages. Ruybal et al. (2018) reports on the design of a portable equilibrator to measure methane in the field. The novel design uses a venturi ejector, static mixer, and free overfall jet stream to achieve a rapid mass transfer of methane from the aqueous to air phase. The equilibrator was demonstrated during purging of six groundwater wells, and the methane concentrations were found to be in good agreement with laboratory analysis.

Muller, K.A. and Ramsburg, C.A. (2018). Influencing of nonwetting phase saturation on dispersivity in laboratory-scale sandy porous media. *Environ. Eng. Sci.* 35, 1062.

Determining dispersivity of solute in groundwater heavily relies on conservative tracer tests that only provide site-specific information; a priori models that can predict dispersivity are limited. Muller and Ramsburg (2018) challenged ten previously published models developed to predict dispersivity on a data set comprised from 133 previously published experiments. The dispersivity in these experiments was determined from conservative tracer test results in fully saturated, NAPL-water, or air-water systems. Only two of the ten previously published models were found to offer predictive capabilities for dispersivity. The authors presented new empirical models that provided superior fits including one model that offers predictive capabilities irrespective of saturation level or presence of nonwetting phase.

2019 AEESP Conference

Dear AEESP Community,

The 2019 AEESP Research and Education Conference at Arizona State University (ASU) is just three months away! Here are some highlights to look forward to (see figure to right for schedule). The conference will start on Tuesday, May 14, 2019 with workshops on the ASU campus in Tempe, AZ. Confirmed workshops are listed on the next page, and a few more workshops might get added. You will be able to register for these workshops during the conference registration process, which will go live this month. The conference will feature four plenary speakers to underscore the conference theme of “Environmental engineers and scientists see cities in 4-D: The built environment, natural environment, human health, and cyberspace.” Dr. Jim Holway, Board Member of the Central Arizona Water Conservation District, will give the first plenary talk on the natural environment dimension using the Colorado River and water supply planning in the Southwest US as context. The first plenary will be held at the Desert Botanical Garden and will be followed by an evening social event. Attendees will be able to explore the Desert Botanical Garden and see the diverse plants of the Sonoran Desert.

All conference activities on Wednesday and Thursday will take place on the ASU campus. The conference will begin Wednesday morning with the second plenary talk by Dr. Gayle Hagler, Assistant Laboratory Director with the US EPA Office of Research and Development (ORD) National Exposure Research Laboratory and research coordinator with the ORD Air and Energy National Research Program. Dr. Hagler’s talk will cover the cyberspace dimension by illustrating how big data from low-cost air sensor networks can be used to provide new perspectives on urban air quality. The morning plenary will be followed by the first poster session. The AEESP conference is known for having high quality and well attended poster sessions so we plan to continue that tradition. The first round of technical session talks will begin late morning on Wednesday. The Conference Organizing Committee, which has faculty from ASU, University of Arizona (UA), and Northern Arizona University (NAU), is currently busy reviewing abstracts to construct the poster sessions and technical session tracks. Authors will be notified in February on the status of their abstract. Dr. Karl Rockne, Environmental Engineering Program Director at NSF, will give a lunchtime talk on the Grand Challenges and Opportunities in Environmental Engineering as a follow up to the recent National Academies report. Wednesday afternoon will feature multiple tracks of technical session talks. Wednesday evening will conclude with a faculty social event organized by Environmental Engineering faculty at ASU, and a graduate student/post-

Tuesday, May 14	Wednesday, May 15	Thursday, May 16
<p>Workshops</p> <p>Jim Holway – CAP-AZ Social @ Desert Botanical Garden</p>	<p>Gayle Hagler – USEPA</p> <p>Poster Session 1</p> <p>Technical Sessions</p> <p>Grand Challenges for Environmental Engineering</p> <p>Technical Sessions</p> <p>Faculty Social; Student Social</p>	<p>Karen Dannemiller–OSU</p> <p>Poster Session 2</p> <p>Technical Sessions</p> <p>Lunch and Learns</p> <p>Technical Sessions</p> <p>Bruce Rittmann – ASU AEESP Meeting & Awards Dinner</p>

doc social event organized by graduate students and post-docs at ASU.

Thursday will follow a similar schedule as Wednesday. The conference will begin with the third plenary talk by Dr. Karen Dannemiller, Assistant Professor at Ohio State University. Dr. Dannemiller’s talk will focus on the human health dimension by examining the indoor microbiome and its implications for children with asthma and unique environments such as the International Space Station. Thursday will feature the second poster session and additional technical session tracks. Thursday afternoon will conclude with the fourth plenary talk by Dr. Bruce Rittmann, Regents’ Professor of Environmental Engineering and Director of the Biodesign Swette Center for Environmental Biotechnology at ASU. Dr. Rittmann’s talk will focus on the built environment dimension and will explore the evolution of resource recovery and capturing value from what we traditionally call wastes. The fourth plenary will be followed by the evening social event including the AEESP business meeting and awards dinner. Please check the conference website (<https://aeesp-2019.engineering.asu.edu/>) and Twitter (<http://twitter.com/AEESP2019 ASU>) for updates. On behalf of the Conference Organizing Committee, I look forward to seeing everyone in Arizona in May.

Sincerely,
 Treavor Boyer
 Conference Chair
 ASU
 Tempe, AZ

Confirmed Workshops at the 2019 AEESP Research and Education Conference

Half day

- *Chinese-American Professors in Environmental Engineering and Science (CAPEES) Research and Education Workshop*, Contact: Baoxia Mi, University of California Berkeley
- *Emerging technologies for water reuse: from ideation to implementation*, Contact: Abigail Cohen, Georgia Tech
- *Equity in the job search tools to successfully navigate the academic job search and promote gender equity in STEM*, Contacts: Bridget Hegarty, Yale University and Desiree Plata, Massachusetts Institute of Technology
- *Establishing Mutually Beneficial Partnerships between Universities and Utilities*, Contact: Morgan Brown, Water Environment Federation
- *Inviting Environmental Engineers to Tackle Problems of Global Peace and Security*, Contacts: Mira Olson and Joseph Hughes, Drexel University
- *Meta-omics in Environmental Engineering Research: Theory, Statistics, and Data Interpretation*, Contact: Ameet Pinto, Northeastern University
- *Multivariate Polynomial Response Surface Analysis*, Contact: David Vaccari, Stevens Institute of Technology
- *Navigating the Academic Job Search*, Contact: Randi Brazeau, Metropolitan State University of Denver
- *Opportunities for Research Funding from the Environmental Research & Education Foundation: Panel on Industry Challenges and Perspectives*, Contact: Stephanie Bolyard, Environmental Research & Education Foundation
- *Science-Based Role Play Simulation for Engaged Decision Making – A Dam Negotiation Application*, Contact: Weiwei Mo, University of New Hampshire
- *Structured Reviews are Necessary to Translate Research into Practice and Policy*, Contact: Daniel Oerther, Missouri University of Science and Technology
- *Sustainability in Engineering Courses: Key Concepts, Key References, and Case Studies*, Contact: Cliff Davidson, Syracuse University
- *Using Environmental Engineering-Themed Undergraduate Research Programs to Enhance Student Engagement in Research*, Contact: Shannon Bartelt-Hunt, University of Nebraska-Lincoln

Full day

- *Environmental Engineering for the 21st Century: Increasing Diversity and Community Participation to Achieve Environmental and Social Justice*, Contacts: Lupita Montoya, University of Colorado Boulder and Matthew Verbyla, San Diego State University
- *Environmental Engineering Program Leaders Workshop*, Contacts: Maria Chrysochoou, University of Connecticut and Joel Burken, Missouri University of Science and Technology

Government Affairs Committee and Environmental Science Policy Advisory Committee Merge; Aim to Expand Membership and Influence

In September 2018, the AEESP Board voted to merge the nascent Environmental Science Policy Advisory Committee (ESPAC) with the existing Government Affairs Committee. This new committee is co-chaired by Profs. Greg Lowry and Kelvin Gregory at Carnegie Mellon University. The committee is charged with 1) proposing AEESP policies that will promote the field and provide opportunities for its membership, and 2) initiate and oversee reviews of relevant public policy statements and provide public comment as deemed necessary, and 3) coordinate AEESP's government affairs activities with those of other related associations, e.g., American Chemical Society, American Society of Civil Engineers, Water Environment Federation, and Environmental Protection Network.

The committee's first task is to develop concise policies for AEESP that convey our purpose and goals. These policies will serve as the basis for interactions with government agencies relevant to the AEESP mission, e.g., funding agencies and US EPA. Initial policy statements will be around research, education, and advocacy. The committee is also watching for important legislation or environmental policy, e.g., Waters of the United States (WOTUS), where AEESP can help to provide science-based, unbiased guidance on the potential environmental impacts.

The new Government Affairs Committee is also looking to grow its membership and diversity. We encourage nominations of individuals to join this important committee (self-nominations are welcome). We will have a table set up at the 2019 AEESP meeting at ASU to provide information for those considering becoming more involved in AEESP. We look forward to seeing you in May.

New Faculty Appointments

Sharon Walker joins Drexel University as the new Dean of the College of Engineering: Third AEESP Fellow at Drexel



Drexel University College of Engineering Dean Sharon L. Walker, PhD, flanked by colleagues Dr. Charles Haas and Dr. Joe Hughes. All three are AEESP Fellows.

Sharon L. Walker, PhD, has joined Drexel University as Dean of the College of Engineering and Distinguished Professor in the Department of Civil, Architectural and Environmental Engineering. Dean Walker is also a water-quality systems expert focusing on the fate and transport of bacteria and nanoparticles in water.

An AEESP Fellow, Walker won the Association's 2018 Mary Ann Liebert Award for Publication Excellence in Environmental Engineering Science. She has produced more than 250 conference papers and publications. Walker is also a two-time winner of the Fulbright Scholarship, for which she visited Ben Gurion University of the Negev in Israel in 2009-2010.

Walker came to Drexel from the University of California, Riverside, where she served as Interim Dean in the Bourns College of Engineering. There, she held the John Babbage Chair in Environmental Engineering, served as professor in the Department of Chemical and Environmental Engineering, and was an associated faculty member in the Department of Bioengineering.

Walker was elected Vice Chair (2015) and Chair (2017) of the prestigious Environmental Nanotechnology Gordon Research Conference. She was an elected official with AEESP and with the American Chemical Society's Colloid and Surface Science Division. In addition, she served as a Panel Manager for the USDA SBIR program.

At Yale University, Walker received her PhD in Environmental Engineering from the Department of Chemical Engineering in 2004 and her MS in Chemical Engineering in 2000. She has two undergraduate degrees from the University of Southern California.

In addition to AEESP, Walker is a member of the American Chemical Society, the American Institute of Chemical Engineers, the Association of Women in Science, the Society of Women Engineers, and the Chi Epsilon, Tau Beta Pi, and Golden Key honor societies.

Dean Walker's priorities at Drexel's College of Engineering include educating the 21st century engineer, supporting translational research in the interest of society's great challenges, and inspiring the College community as it seeks new levels of scholarship and academic achievement.

Walker joins two other AEESP Fellows at Drexel — Charles Haas and Joe Hughes. All three are pictured above.

John Fortner joins the environmental engineering faculty at Yale



Yale University is pleased to announce that John Fortner has joined the environmental engineering faculty as an Associate Professor of Chemical and Environmental Engineering in January 2019. His hiring is part of the ongoing expansion of the Environmental Engineering Program at Yale University. Fortner received a BS degree from Texas A&M University and a PhD degree from Rice University. His postdoctoral training was at the Georgia Institute of Technology and ETH Zurich, which was a joint position, and at then at Rice, where he was an Intelligence Community fellow. Since 2010, he has served on the faculty of Energy, Environmental and Chemical Engineering at Washington University in St. Louis where he held an InCEES Career Development professorship. Fortner's research is broadly focused on advancing water-related technologies and understanding/engineering novel material interfaces as they relate to critical environmental-based health, security, and energy challenges. Fortner has been awarded an NSF CAREER Award, the Sustainable Nanotechnology Organization Emerging Investigator Award, an ACS Doctoral New Investigator Award, the WUSTL School of Engineering and Applied Science Dean's Teaching Award, and the CH2M Hill AEESP Outstanding Doctoral Dissertation Award, among others.

Mukesh Kumar joins the Department of Civil, Construction, and Environmental Engineering at the University of Alabama



Mukesh Kumar joined the Department of Civil, Construction, and Environmental Engineering at the University of Alabama as an associate professor in the Fall 2018 semester. His research is geared toward improving the understanding and prediction of hydrologic processes in order to better assess the impacts of variations and changes in climate and land use/land cover on water quantity and quality. To this end, he works on hypothesis testing through data analysis and application of physically-based models. He has co-developed several open-source models and interfaces including PIHM (Pennstate Integrated Hydrologic Model), PIHMgis, FIHM, FoRM (Forest

Radiation Model), BPT (Barrier Prioritization Tool) and SPAC (Soil-Plant-Atmosphere Continuum Model), many of which are being widely used in academia and government. Kumar's research recognitions include an NSF CAREER Award, a UCOWR PhD Dissertation Award (2nd Prize) and an Outstanding Student Paper Award at the AGU. In recognition of his outstanding contributions, he received the Mahatma Gandhi award in 2018. Mukesh did his B.Tech at IIT Kanpur and his PhD at Pennsylvania State University. Prior to joining the University of Alabama, he was a faculty at Duke University.

Hamed Moftakhari joins Alabama



Hamed Moftakhari joined the Department of Civil, Construction and Environmental Engineering at The University of Alabama (UA) as an assistant professor in August 2018. His research interests are in the area of coastal hydrology and involve multi-hazard risk analysis/management and integrated coastal/estuarine hydrodynamic modeling. He explores how the interaction between inland hydrologic processes and coastal ocean processes would affect re-

sources such as food, energy and water in low-lying coastal regions and how the response of affected communities would mitigate or intensify impacts. His research is mainly focused on two categories of processes: (i) extreme events with multiple underlying drivers, and (ii) minor repetitive events (i.e. nuisance flooding) with chronic impacts that would pose considerable cumulative costs over time. His research sheds light on the projected risk associated with compounding effects of natural hazards due to human activities and sea level rise. Moftakhari holds a PhD in Civil and Environmental Engineering from Portland State University (2015), an MS in Civil Engineering-Water Resources from Sharif University of Technology (2010), and a BS in Civil Engineering from Iran University of Science and Technology (2007). Prior to joining UA, he worked as a postdoctoral scholar in the Department of Civil and Environmental Engineering at the University of California, Irvine from 2015 to 2018.

New Faculty Hires at Ohio State

The Civil, Environmental and Geodetic Engineering Department at The Ohio State University is pleased to welcome three assistant professors into the 'environmental' group this year.



Dr. Jordan Clark investigates the physical processes affecting energy consumption, thermal environments, and air quality in sustainable buildings. His most recent research focuses on leveraging the recent explosion in sensing technology, communication, and data analytics capabilities to optimize heating, ventilation and air-conditioning devices and create smarter, more energy-efficient, healthy buildings. This includes the development of energy and airflow simulation tools to quantify the efficacy of ven-

tilation control strategies in homes with "smart ventilation" and investigations into low-cost particulate matter sensors for integration into smart building control systems. Clark worked for several years as a structural engineer before an interest in green buildings prompted him to pursue a PhD

in the U. Texas Building Energy and Environments program. He held research appointments with the National Renewable Energy Labs in Colorado and Berkeley before joining Ohio State.



Dr. Natalie Hull examines the molecular mechanisms of water disinfection by ultraviolet light with specific interests in applications to small water systems. Her research approaches integrate emerging molecular biology tools, novel sensors, and big data analytics to better optimize treatment technologies to control microbiomes in natural and engineered waters to protect public and environmental health. Current projects include the development and testing of an ELISA biosensor for measuring UV-induced viral genome and protein damage and the impacts of UV light and chlorine disinfection on microbial community growth on solid surfaces. Hull brings broad experience in water treatment applications in developing countries, microbial ecology of water in built environments and toxicity of hydraulic fracturing fluids. She joins Ohio State with a PhD from U. Colorado Boulder.



Dr. Jim Stagge is a hydrologist with interests in hydrologic extremes, drought, water resources management, and the effects of climate change on surface water resources. One major area of emphasis is the use of tree-ring chronologies to reconstruct monthly stream flows over timescales that extend to 600 years with the goal of enhancing water management planning around drought vulnerability. Related work includes applications to improve the calculation of relative drought indices. He has also designed logistic regression models to relate drought indices to the likelihood of agricultural losses, wildfires and public water supply deficits. Current plans include using such models in concert with drought forecasts for real-time impact predictions and for projects of climate change effects. Stagge received his PhD from Virginia Tech and completed post-doctoral appointments at the U. Oslo and Utah State University.

Dr. Yang Yang joins Clarkson University



Dr. Yang Yang is joining the Department of Civil and Environmental Engineering at Clarkson University as an assistant professor in the Spring 2019 semester. He received his BS from South China University of Technology in 2009 and a PhD from Tsinghua University in 2014. He then worked at Caltech as a postdoctoral scholar and a research scientist for four years. Yang specializes in the synthesis and characterization of advanced nanomaterials along with their environmental catalytic applications in water treatment, flue gas purification, and value-added chemical production. His work has been published in major journals such as *ACS Catalysis*, *Environmental Science & Technology*, and *Applied Catalysis B: Environmental*. He is serving as the associate editor of an Elsevier journal, *Emerging Contaminants*.

Xue Jin joins Oregon State



Dr. Xue Jin joined the School of Chemical, Biological and Environmental Engineering at Oregon State University in October 2018 as an assistant professor. Jin was hired as a part of the newly endowed interdisciplinary Clean Water Initiative (CWI) at OSU. Her research spans the water-energy nexus field with a specific focus on developing novel membrane materials and processes to reduce fouling, increase disinfection effectiveness, produce reuse quality

effluent and generate energy during wastewater treatment. Jin received her PhD in Environmental Engineering from the National University of Singapore in Environmental Engineering in 2007. She also received her BS in Environmental Science & Engineering from Tsinghua University in 2002. Prior to joining the faculty at OSU, Jin was a post-doctoral research associate at UCLA and a research fellow in the Singapore Membrane Technology Center at Nanyang Technological University. Most recently, Jin was an assistant professor in the School of Engineering at the University of Glasgow and worked for Sembcorp Industries' Ltd, Department of Water Innovation. Potential graduate students are welcome to contact Dr. Jin at xue.jin@oregonstate.edu if they are interested in joining the group.

Shakira Hobbs joins University of Kentucky



Dr. Shakira Hobbs joined the Department of Civil Engineering at University of Kentucky as an assistant professor in January 2019. Hobbs' scholarship explores system approaches to sustainable engineering, international development, and life cycle thinking at the food-energy-water nexus. In 2018, she founded BioGals, a US non-profit organization that works internationally, empowering women of color to create sustainable solutions. Through community-engaged work

with residents of Sittee River in Belize, BioGals has applied LCA and piloted anaerobic digestion to supplement cooking fuel needs with the community. Broadening participation, gender, and global competency are complementary areas of research for her.

She earned a BS from the University of Maryland, College Park in 2012, an MS from Arizona State University in 2014, and a PhD in Civil Engineering from Clemson University in 2017. She then worked at the University of Virginia as a postdoctoral scholar for 1.5 years. Hobbs is dedicated to disseminating engineering and sustainability concepts to the public and creating diverse collaborations that investigate holistic management techniques to wicked problems. Both Hobbs' postdoctoral and graduate experiences have yielded peer-reviewed publications (including a peer-reviewed publication with an NAE member) and funded research projects that will enable her to quickly establish a research program at the University of Kentucky.

Meng Wang joins Penn State



Dr. Meng Wang joined the Penn State University John and Willie Leone Family Department of Energy and Mineral Engineering as an assistant professor in Environmental Systems Engineering in September 2018. Wang received her PhD in Civil Engineering at the University of Massachusetts Amherst. Prior to her appointment, she was a postdoctoral researcher at the University of South Florida. Her research focuses on environmental biotechnology for pollution control, resource recovery and environmental sustainability. She combines physical-chemical processes with biological process to improve system stability and resource recovery efficiencies. Her research uses experimental work and mathematical modeling to guide the design and operation of treatment systems. She is interested in developing innovative food-energy-water systems for resource recovery, public health and food security.

She is interested in developing innovative food-energy-water systems for resource recovery, public health and food security.

Colleen Naughton joins the University of California, Merced



Dr. Colleen C. Naughton joined the Department of Civil and Environmental Engineering at the University of California, Merced as an assistant professor in January 2019. Naughton's research focuses on developing sustainable and culturally sensitive food-energy-water systems locally, nationally, and globally through Life Cycle Sustainability Assessment, Geographic Information Systems (GIS) and ethnographic methods. Naughton has experience and training in connecting science to policy. She completed a Science and Technology Policy Fellowship through the American Association for the Advancement of Science (AAAS) in Washington, D.C. with the Millennium Challenge Corporation (MCC). At MCC, she served as an Environmental and Social Systems Advisor, advancing the use of GIS and data-driven solutions throughout the agency and was a part of the Morocco, Tunisia, and Togo country teams. Naughton obtained her doctorate at the University of South Florida (USF) in the Department of Civil and Environmental Engineering and was also a postdoctoral researcher there.

She was part of the USF Peace Corps Master's International Program where she served and conducted research in Mali, West Africa for three years as a Water, Sanitation, and Hygiene (WASH) Engineer. Her dissertation research modeled food security, energy, and climate and cultural impacts of the shea butter production process in sub-Saharan Africa. She continues non-profit work and research in Mali as the current Associate Director of African Sky (<http://www.africansky.org/>)

Naughton also conducts research in WASH and is an author of several chapters for the Global Water Pathogen Project (<http://www.waterpathogens.org/>). The GWPP is an online database and knowledge platform that will be published into a book by UNESCO in several languages on water-related diseases, risks, and technology interventions (e.g. wastewater treatment).

AEEESP Environmental Engineering and Science Stories: Lilia Abron, PhD, PE

Dr. Abron was one of the first interviewees for the AEEESP Environmental Engineering and Science Stories, a video series produced by AEEESP President Dr. Maya Trotz (University of South Florida) and shared on the AEEESP YouTube Channel, AEEESPProf. Below is the transcript of an interview conducted in 2011 at the AEEESP conference held in Tampa with Dr. Abron. She is currently the Vice President of the American Academy of Environmental Engineers and Scientists (AAEES) and is the founder and CEO of PEER Consultants, Ltd. In 2012, her company received the AAEES Excellence in Environmental Engineering Superior Achievement Award for the Witsand iEEECO™ Sustainable Human Settlement project in Cape Town, South Africa, which had been entered in the Environmental Sustainability category.

AEEESP: What got you interested in environmental engineering?

Abron: When I was in the second grade, I believe, Russia sent Sputnik to the moon. So, it scared the United States to death knowing the Russians were out ahead of us, scientifically. At that point, the United States of America started tracking students. That was my age group, and I got tracked from second grade, third grade, based on aptitude and knowledge, I guess, into a science curriculum. So, I really never knew anything other than going into science, or math, or medicine, or something like that. I thought I wanted to go into medicine. But Rachel Carson wrote her book, *Silent Spring*, in 1965, when I was in high school, getting ready to graduate. And that book kind of struck me as to what was happening in our environment. Everybody was beginning to pay attention to it at that point. Not now — we started paying attention to the environment a long time ago.

In my household, being raised in the segregated South, the men who collected the garbage and trash were, you know, the garbage men, but because they were black, we were never allowed to call them “garbage men” in the house. So we decided as little girls, so our parents wouldn’t get upset with us, we’d call them the sanitary engineers. One day, when I was a senior in college, I was walking by the bulletin board in the admin building and saw this sign that said, “Scholarships in Sanitary Engineering.” At that time, it wasn’t environmental, it was sanitary. And I said, “Scholarships for Master’s Degrees in Sanitary Engineering. They have to be kidding me. What is that?” So, I read, and I said, “Oh my goodness, this is what I’m really interested in. It’s the science, it’s the math and, of course, it was the environment.” So that thing of not calling them garbage men but sanitary engineers, and Rachel Carson writing her book, that was sort of the impetus for me to say, “This is really what I want to do. I really think the environment is where I’m comfortable, where I feel good. I think this is going to be my contribution. This is going to be my profession.”

I went into Environmental Engineering and got my PhD and loved the environment. For the first 6, 7 years of my life I got into university teaching. But then I went into practice. Everything that I’ve done has been dedicated to and focused on enhancing the physical and human environment.

AEEESP: What does PEER Consultants do?

I still have the company today and we do consults for water, wastewater, hazardous waste. We work all over the US. Around 1995, we opened up in South Africa at the request and invitation of President Nelson Mandela, and we’ve been working there since. We decided to pay more attention to the human environment rather than the physical environment in South Africa and developed a specialty in the design, development and implementation of sustainable communities.

AEEESP: Who were your mentors?

Abron: Well, of course, most of us, especially Southerners, always have to start with our parents. And most of us from the South have to say, “our mothers,” who did not let us breathe because they had intentions for us. The whole thing was to make sure that we got a decent education so that we could take care of ourselves. You want to make sure that your children, especially your girls, are in a position to always be able to take care of themselves. So, I have to say my parents, with my mother, and my environment, because we were raised in a middle class, educated environment.

In college, interestingly enough my English professor, Dr. Juanita Williamson, was a very big influence in my life. She would not let me take a back seat or back step. And she just kept pushing me along. And my chemistry professor, Dr. Abuela, who realized early on that I really should have maybe gone to an engineering school or something like that. But at that point in Memphis, we were still working somewhat in a segregated environment, so he worked with me to make sure that I got all of the necessary coursework, so I could do differently in graduate school.

For my Master’s program all of my professors were all absolutely fantastic and I have to say that

they were all mentors. One of the reasons why I think I have the consulting firm today is because they had a consulting firm, and I was always watching them. Even though they were very good in the classroom, I was always watching what they were doing in their business. And I said, “well one day maybe I’ll have a consulting firm, or maybe I’ll teach.”

One of my classmates, Dr. Cecil Lue-Hing, has been a lifelong mentor. Dr. Lue-Hing came down to LeMoyne College, interviewed me when I applied to graduate school and convinced me to come to Washington University, and he has tracked me all the way. Some of the many wonderful things that have happened to me in life professionally still occur because of Dr. Lue-Hing. We are still extremely good friends. And then Dr. Leon Weinberger, who I met through Dr. Lue-Hing, helped me start PEER and stayed with me for a very long time in the company as it was growing and developing. So, I can say maybe those people were the strong mentors in my life that got me where I am professionally, but I guess my parents for getting me where I am professionally and socially.

AEEESP: What were challenges you faced early in your education and career?

Abron: Perhaps the first challenge is obvious. Being frequently the lone female and frequently the lone black person in the classroom situation and in the work environment — that could present some problems. But we were raised to be extremely confident about ourselves and who we are and what we are, so those barriers for me were easy to overcome, especially when you are raised in a segregated environment as we were, growing up in Memphis, a lot of the barriers that some people might witness, we grew up early learning how to overcome those things. So barriers that maybe could have presented a problem going to school, did not. My undergraduate college was completely black so that was not a problem. Then in graduate school, I think the larger barrier was the size, because I went to a small undergraduate school. But I’ve found all along the way, in work-

ing on both my Master's and PhD degrees, that I had very strong, supportive professors who really were determined to see me succeed. I felt like that, at least. So I had no problems there. I think one of the first challenges was when I started teaching and, for the first time, coming in contact with Asian male co-workers who had, at that point in time, a different perspective of women. So, trying to be accepted as a professor in a college of engineering with Asian males did tend to be a challenge.

And then the bigger problem, of course: challenges when you open up a consulting firm — the whole challenge of being a small business. Small businesses are always under-capitalized, always

having many problems. So, the bigger challenge within the consulting business was winning the work, and keeping the work, and making sure you get the work done, and making sure that you can meet payroll. So it's a little different between those of us who go into academia and those of us who go into practice. Being in practice is the whole thing of being an entrepreneur and surviving. Whatever challenges — I overcame them, and I still have them every day, but we've been fortunate enough to be in business for 35 years. So I've been able to overcome a lot of those challenges, but it's like you always say, "Can I breathe? Can I exhale?" And you say, "No, Lillian not today. Maybe tomorrow."

I truly believe that humans and the environment can co-exist. We can do it together and we can benefit and enhance each other. And I believe that I have the responsibility to pass on a cleaner environment to the next generation. Cleaner and better than what I received. And with my skills, training and education we know how to do that, and I'm going to do my part to see to it that it's done.

Dr. Abron is a mother with three grown children, all boys, and grandchildren.

Director Position at Tennessee Tech University's Water Center



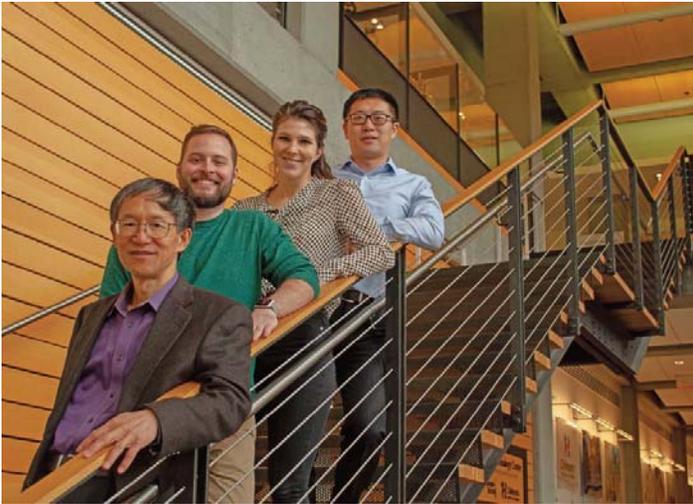
The Center for the Management, Utilization and Protection of Water Resources (Water Center, www.tntech.edu/watercenter) at Tennessee Tech University (TTU) invites nominations and applications for a Director to provide long-term vision and lead the Center's mission through a sustainable research plan, over-see scholarly/educational activities, and manage Center administration. Essential functions include maintain-ing and strengthening the Center's research program and guiding its strategic plan; leading a productive, externally-funded program within his/her expertise; performing administrative duties; working with Center research leaders, faculty, and staff to expand and create collaborations to grow the research portfolio; develop-ing strategies to sustain future research; developing, implementing, and sustaining the Center's strategic alliances and partnerships with relevant research organizations, universities and governmental agencies; and representing the Center and TTU to the public, key stakeholders, academic and industry partners, and state and federal entities.

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Dr. Yongsheng Chen of Georgia Tech receives \$5 million grant from USDA



Post-doctoral fellow Bopeng Zhang, graduate research assistants Abigail R Cohen and Thomas Igou, and Professor Yongsheng Chen from the School of Civil and Environmental Engineering will pilot a project to use wastewater nutrients to grow lettuce, tomatoes and other fruits and vegetables.

Dr. Yongsheng Chen of the School of Civil and Environmental Engineering at the Georgia Institute of Technology has recently received a USDA grant of \$5 million for his project growing produce with the campus's recycled wastewater. The grant is the largest of its kind that the university has ever received.

The goal of the project is to develop a system that can safely utilize the nutrients contained in domestic wastewater to grow produce in urban areas. It is the first of its kind to incorporate the hydroponic procedure in the capturing of wastewater nutrients, using nanomaterials and smart membranes to filter out contaminants from the wastewater before use — an anaerobic process that also reduces the sludge waste produced in comparison to common aerobic sludge systems. At the prototype stage, the project expects to treat around 2,600 gallons of wastewater per day starting in August 2019.

Chen says that the goal of the project is to show that decentralized food production using urban wastewater is “socially, environmentally and financially sustainable and can easily be replicated in other cities.” The team is quick to reassure that any food grown in the project will undergo extensive health and safety checks before it is deemed suitable for human consumption. Researchers are also collaborating with the Mayor’s Office of Sustainability to help future consumers overcome the perception issues of using wastewater in the growing process.

Once completed, this project will have significant implications for increasing sustainability in cities. Growing vegetables within the urban area means that the produce will not have to be transported into the cities by truck, reducing the carbon footprint. Additionally, the project’s recycling of wastewater nutrients would reduce the need for synthetic fertilizers, and it will also significantly increase the nutritional quality of locally grown produce, which will benefit the community at large. The project is the latest of Chen’s efforts to apply nanotechnology to different, innovative aspects of environmental engineering.

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Membership in AEESP offers important benefits to educators, researchers, students, professionals, corporations and organizations engaged in the environmental engineering and science profession. All who are eligible for membership are welcome to join the Association and to participate in the full range of benefits and opportunities. Membership categories and fees are described below, with complete definitions provided in the AEESP Bylaws. Applying online is easy! We welcome your participation!

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Regular Membership in AEESP is open to persons of full-time faculty or instructional rank (instructors, lecturers, assistant, associate, full professors) in environmental engineering or environmental science at academic institutions that offer baccalaureate, diploma, or graduate degrees in environmental engineering, environmental science or related fields.

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Full Professors	\$100
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- Individuals who were members at one time and who have retired from active teaching.

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Sustaining Membership is open to individuals and organizations whose concern for education in environmental engineering and related fields stimulates them to assist in strengthening university programs devoted to this area. Sustaining members are often those who employ or interact closely with graduates of environmental engineering and science programs such as consultants, utilities, research foundations, professional organizations, publishers and equipment manufacturers. The financial support provided by Sustaining Members allows AEESP to carry out a variety of special programs that benefit all members of the profession. Sustaining Members have access to all AEESP publications and are invited to all AEESP events. Organizations or individuals desiring more information on Sustaining Membership should write to the Secretary, the President, or the Business Office.

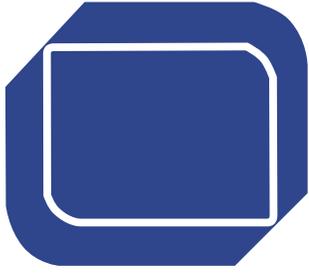
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