



AEESP Newsletter

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AEESP membership?

Go to "Membership > Online Renewal"
on the AEESP Website:
<https://aeesp.org/content/online-membership-renewal>
AEESP.org

AEESP Newsletter Submissions

Please send news, conference announcements, job postings, letters to the editor, and other contributions to the newsletter to Kyle Doudrick at kdoudrick@nd.edu. The next newsletter will appear in October 2021.

President's Letter

BY JOEL J. DUCOSTE
North Carolina State University



Figure 1

They say the office of the presidency tends to age the holder of the office. You can review the images of several US presidents to see the change. I did not think it would happen to me. But I guess I was wrong (Figure 1). Actually, I like the change. But enough about my transformation. I want to share some of the amazing work done by you, the members of AEESP despite the major health and societal challenges that have befallen our nation and the world. The work being performed will hopefully help improve our interactions with each other and the constituencies that we serve.

Let's begin by sharing the strategic planning work. Several of our members have participated in a process that involved over 45 members cutting across several environmental engineering and science focus areas, regions of the USA and Canada, faculty ranks, population demographics, and research and educational intensive universities. The planning process included facilitated sessions with this diverse membership to converge on a five-year plan to help the association provide more value to its membership and the profession.

Over the last several months, these AEESP members have engaged in a collaborative strategic planning input process that probed questions such as what is the one big thing that should be addressed by AEESP, what strategies will make AEESP valuable to members, what specific skills and tools do faculty need to be successful, and how are we different from other associations (AWMA, AWWA, AGU, WEF, ACS...), just to name a few. While the above questions were clearly not meant to be comprehensive, they were designed to inspire some initial thoughts that were brought out during the meeting.

AEESP's strategic plan is not expected to significantly alter the current strategic direction of the association, but rather to update what has been accomplished, refine areas of focus, identify or modify important goals, and align committee activities along the current challenges and opportunities that are identified by our members and other key stakeholders. A strategic planning steering committee has met to review, characterize and prioritize input from the various sources and helped to establish the draft content and structure for communicating the revised strategic plan. I want to acknowledge my colleague Dr. Marc Hoit from NC State University, who was our facilitator and helped record all the information that was shared during these meetings in the initial draft report. We are on course to finalize the document with prioritized themes and goals that will allow us to implement this next strategic plan and introduce it to our entire membership by our virtual appetizer conference put on by Washington University in St. Louis on July 13-14, 2021. Please consider attending the virtual conference.

We have also started the hard work to revamp the AEESP website. The IRC and a subcommittee have worked with Mandy Ferguson, our website developer, to update our website and put it in line with the current state of websites found with most professional organizations. A list of priorities for improvements to the website included the ability to upload attachments by committees to share with membership, improving access for job search ads, awards applications, donations to foundation endowment initiatives, announcements for grant opportunities in the environmental engineering and science field, just to name a very small subset of website improvement opportunities. But most importantly, we hope that the website will provide the opportunity for greater communication and exchange of ideas, advice, and best practices that our members are willing to share for the advancement of our profession, careers, and service to our constituencies. Preliminary mockups of the home page are being reviewed with a small portion of it shown in Figure 2 (see page 2).

Continued on page 2



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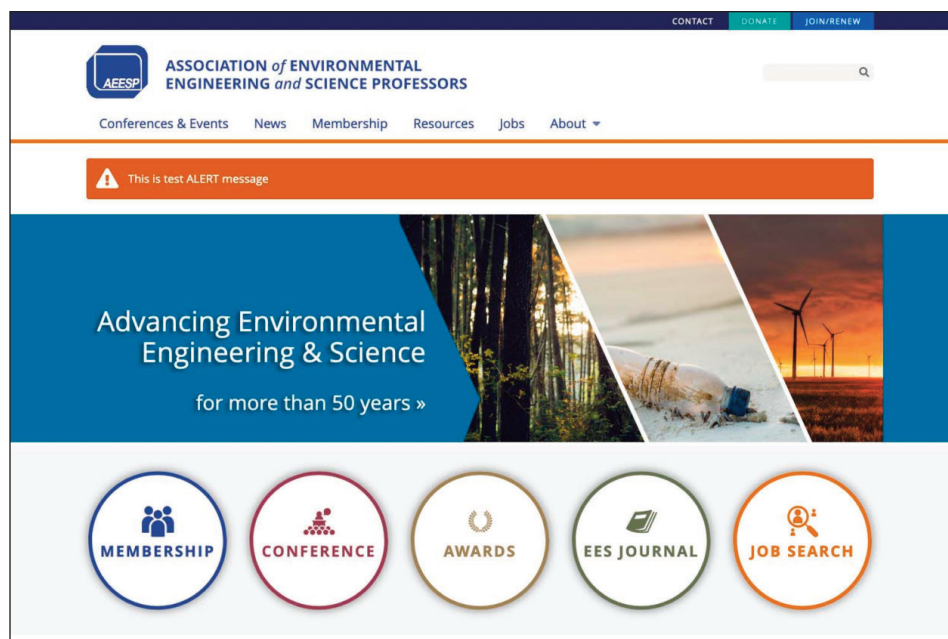


Figure 2

Over a year ago, our community watched in disbelief at the murder of Mr. George Floyd. His death catalyzed a movement as millions of people protested and spoke out against systemic racism and called for justice. Personally, I hoped that justice would be served to Mr. Floyd's family. This justice is needed so that the voices of so many who decried his death and the racism, can feel that they have been heard. Recently, a jury of Mr. Floyd's peers found Mr. Chauvin guilty on all counts for his murder. It's possible that many felt some sense of closure from this verdict. However, this event does not eliminate the continued assault on black lives. These ongoing assaults should remind us of the continued and urgent work to ensure issues of systemic racism and all forms of oppression are addressed.

At AEESP, our Membership and Demographics Committee, Board of Directors, and members of our association have developed AEESP's commitment to justice, equity, diversity, and inclusion (JEDI) statement. You will find it on page 6 of the newsletter. Our statement clearly states that JEDI are integral to promote the free exchange of ideas and collaborative synergy needed to achieve the vision and mission of AEESP. In addition, we have joined the Societies Consortium on Sexual Harassment in science, technology, engineering, mathematics, and medicine (STEMM). The consortium supports academic and professional disciplinary societies in fulfilling their roles as a major conveyor of standards for excellence in STEMM fields and addressing sexual harassment in all forms and intersectionality. We at AEESP

are taking all the important steps to make sure that during our interactions at all AEESP related meetings that an unbiased and welcoming culture is developed and allows all members to be their authentic selves, bring in their life experiences and creativity, and participate without experiencing racism and bias of any kind.

I am grateful for all the ongoing work that members are doing and will continue to do on behalf of a stronger AEESP. The Student Services Committee (SSC) completed a successful online seminar series featuring graduate students and postdocs with an additional specific focus on diversity. Their goal was to showcase the depth and breadth of our field from the diversity of the researchers to the vast research topics covered by our association. In addition, it provided an opportunity for rising academics to network with other researchers in the field. SSC plans to continue this initiative in the next academic year.

There is so much more to come under the leadership of colleagues Bill Arnold (Pres-Elect), Allison MacKay (VP), our board members, and committee chairs. I will be doing my due diligence to support them and AEESP's vision and mission. In addition, I hope to help grow and diversify our membership and work with our stakeholders and partners to also help diversify the environmental field. I have enjoyed talking with colleagues, postdocs and graduate students about career strategies and overall advice for continued success. It is important that we all share our wisdom with each other and to embody the concept of Ubuntu (I am because we are) (Karsten, L., &

Illa, H. (2005). J. Manag. Psych., 20, 607-620.) which I initially shared in my last newsletter. American Academy of Environmental Engineers and Scientists (AAEES) President, Dr. Lilia Abron, and I have started a podcast entitled Environmental Conversations with Lilia and Joel (<https://www.environmentalconversations.com/>). Our hope is to share the environmental

engineering and science challenges and solutions that are being performed by rising stars and seasoned academics and practitioners, and to energize the next generation of solution makers with a diverse set of lived experiences.

At the end of the day, what we have learned through this pandemic is that life is precious and

personal wellbeing and interactions with others are critically important. Encouragement, mentorship, listening to others, empathy, reducing implicit (explicit or unconscious) bias footprint, and along the way, having fun must be a part of our everyday life experiences. We are all here to support each other through life's uncertain and yet beautiful experiences. Be well and continued success.

AEESP Virtual "Appetizer"

July 13-14, 2021

10:00 AM – 3:00 PM Central Time

Please join us for a taste of what's to come at the 2021 AEESP Virtual "Appetizer." This two half-days event is an opportunity for our community to connect this summer in advance of the in-person conference that will be held in St. Louis June 28-30, 2022. **Registration is now open at <https://cvent.me/Egn3DP>. Registration for the "Appetizer" is free for AEESP members (current and recently joined) who register by June 29.** Some of the workshops have earlier registration dates.

July 13, 2021

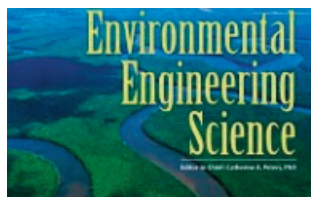
- Opening session with the keynote lecture "Engineering Change in STEM Education: A JEDI Approach" from Yvette Pearson of Rice University and an update on AEESP strategic planning from current AEESP President Joel Ducoste.
- Parallel workshops for environmental scientists and engineers at different career stages:
 - Careers in Environmental Engineering & Science after Graduate School
 - CAREER Virtual Workshop
 - Leadership Training for Faculty: A Discussion of Available Opportunities and Return on Investment
- "Meet the Candidate" networking reception for people coming onto the academic job market and for universities looking to recruit new talent. Participating candidates will provide a short CV and video introduction that will be available before the live networking session on July 13.

July 14, 2021

- A Platform Session on Diversity, Equity, and Inclusion which consists of a report on the successful "Converging COVID-19, environment, health, and equity" 2020 webinar series and a town hall event "Beyond Recruitment: Development of a Guidance Framework to Foster Black Junior Environmental Engineering Faculty Success."
- Parallel workshops:
 - Aerosol Science and Engineering and Public Health: Focus on COVID-19
 - Equity in the Job Search: Tools to Successfully Navigate the Job Search & Promote Gender Equality in STEM—
 - Environmental Engineering Program Leaders Annual Workshop
- Closing session with an address from incoming AEESP President William Arnold and the annual AEESP awards ceremony.

We look forward to seeing you in July.

Daniel Giammar and Young-Shin Jun



EES Special issue – Call for papers:
*Life Cycle Thinking
in Environmental Sustainability*



Submission by
August 13, 2021



CALL FOR PAPERS

Special Issue of Environmental Engineering Science Life Cycle Thinking in Environmental Sustainability

Environmental sustainability protects our natural environment and safeguards human wellbeing and ecosystem health. Life cycle assessment (LCA) is key to driving innovation that supports environmental sustainability because LCA takes a systems approach and holistic view of materials and energy flows. This special issue of *Environmental Engineering Science* (EES) will present research that advances life cycle thinking and systems analysis in environmental engineering and science.

Specific topics may include:

- Advancements in sustainable energy, resource efficiency and recovery, urban infrastructure, climate change adaptation, materials design, waste management, greenhouse gases and net-zero emissions, food-energy-water systems.
- Combining life cycle and systems thinking with anthropological and socio-economic analysis to examine environmental justice and equity.
- Improvements in data collection, curation, and analysis to support life cycle assessment and robust decision making.
- Innovations in education around environmental sustainability and life cycle analysis.

Additional details are at <https://home.liebertpub.com/cfp/life-cycle-thinking-in-environmental-sustainability/330/>

Manuscript submission deadline is August 13, 2021.

If you are interested in submitting a manuscript, potential authors should fill out this form to assist us in planning. <https://forms.gle/3Zg8tG7n3DeJvYpe9>

EES is the official journal of the Association of Environmental Engineering and Science Professors (AEESP). Authors who are AEESP members should identify as members during the manuscript submission process. AEESP members receive 25% discount on the Open Access publication fee, and there is no charge to publish color art or figures.

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Spotlight: Environmental Engineering Science, AEESP Journal

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

The “spotlight” column draws attention to selected articles in *Environmental Engineering Science (EES)*, the official journal of the Association of Environmental Engineering and Science Professors (AEESP). Spotlight articles appear regularly in the journal as an Editor’s Note, as well as in the AEESP newsletter. Through the 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 December 2020 through March 2021 issues of *EES*. Congratulations to all whose work is highlighted.

The highlighted articles in this Spotlight edition each discuss global challenges (National Academies of Science, Engineering, and Medicine, 2019) that environmental engineers and scientists will continue to work to solve in the coming decades. As discussed by Deng et al. (2021), the sustainable use of Earth’s natural resources is essential to addressing the challenges of supplying water and energy to the world’s population of almost 8 billion people. Reactive transport modeling, which is highlighted in the March Special Issue, is a powerful tool that can aid in addressing these challenges. Removing antibiotic-resistant genes from wastewater treatment plant effluent is essential if we are to meet the challenge of creating healthy cities. Also, important to creating healthy cities is assessing the impact of catastrophic nuclear accidents on public health and then mitigating those impacts. Finally, part of the challenge of adapting to the impacts of climate change can be tackled by improving our understanding of the influence of nutrients on hazardous algae blooms.

Gonzalez-Estrella, J., Ellison, J., Stormont, J.C., Shaikh, N., Peterson, E.J., Lichtner, P., Cerrato, J.M. (2021) Saline Brine Reaction with Fractured Wellbore Cement and Changes in Hardness and Hydraulic Properties. *Environ. Eng. Sci.* 38(3), 143-153.

As discussed by Gonzalez Estrella et al. (2021) the release of hydrocarbons from cement fractures of wellbores used for oil and gas industry can result in the released of greenhouse gases, including carbon dioxide (CO_2) and methane, into the atmosphere. This study used reactive transport modeling along with bench experiments to investigate the effects of reactive saline brine water at circumneutral pH with fractured wellbore cement. Calcite was found to precipitate along the flow path, decreasing the transport of fluid through the damaged wellbore system. The results suggest that leakage of hydrocarbons into the environment can be mitigated by the injection of saline brine supersaturated with respect to calcium carbonate.

Iloejesi, C.O. and Beckingham, L.E. (2021) Assessment of Geochemical Limitations to Utilizing CO_2 as a Cushion Gas in Compressed Energy Storage Systems. *Environ. Eng. Sci.* 38(3), 115-126.

Renewable energy sources, such as wind and solar power, are essential to a sustainable future and maintaining CO_2 levels below 450 ppm. As solar and wind power are intermittent, there is growing interest in methods to store energy. One promising method is compressed energy storage, where a cushion gas, e.g., CO_2 , is injected into saline aquifers during times of low energy consumption and extracted during times of high demand. However, the potential interactions between CO_2 and saline groundwater and their effects on operation are unknown. Iloejesi and Beckingham (2021) used reactive transport simulations to evaluate these interactions and the functionality of using CO_2 as a cushion gas in a porous formation. They found that injected CO_2 can result in the dissolution of carbonate and aluminosilicate minerals; however, the extent of dissolution decreased after the first injection. The results suggest that storage volume and injectivity will remain relatively constant after the first cycle, making the utilization of cushion gases, including CO_2 , a viable means of energy storage.

Kaltofen, M.P.J., Gundersen, A., Gundersen, M. (2021) Radioactive Isotopes Measured at Olympic and Paralympic Venues in Fukushima Prefecture and Tokyo, Japan. *Environ. Eng. Sci.* 38(2), 59-65.

In addition to renewable energy sources, nuclear power is seen as essential

to maintaining CO_2 levels below 450 ppm and part of a sustainable energy future (World Nuclear Association, 2021). However, the catastrophic damage of the Fukushima Dai-Ichi Nuclear Power Plant in 2011 and the Chernobyl Power Plant in 1986 demonstrated the transcontinental transport of the released radioactive isotopes and the global impact of these accidents. As numerous events of the 2021 Summer Olympic Games will be held in the Fukushima Prefecture, there is concern that visitors and athletes may be exposed to radioactive contaminants emanating from the Fukushima Dai-Ichi site. In this study (Kaltofen et al., 2021), soil and dust samples were collected from sites in the Fukushima Prefecture, Greater Tokyo, and in areas between these sites. Alpha and beta activities were not correlated. Radioactivity at Olympic venues in Greater Tokyo was similar to those in the control set from the USA. The beta activity in the sample set from Northern Japan was 7 times greater than that in the samples from Tokyo Olympic venues, demonstrating the relative success of remediation activities at the Olympic/Paralympic venues as compared to elsewhere in Japan. Data from the Fukushima Prefecture demonstrates the need for continuing assessment and perhaps additional remediation work.

Chujo, M., Li, J., Datta, T., Amano, Y., Machida, M. (2021) A Competitive Growth Model for the Simulation of Cyanobacterial Blooms Under Eutrophic Conditions. *Environ. Eng. Sci.* 38(1), 15-23.

Climate change is predicted to increase water temperature and favor the growth of cyanobacteria in both marine and freshwaters, increasing the frequency, severity, and geographical distribution of harmful algal blooms (HABs). Chujo et al. (2021) developed a novel competitive growth model for *Microcystis* sp and *Cyclotella meneghiniana*, two organisms that proliferate during HABs. The growth model, which was based on the Droop and Lotka-Volterra models, incorporated nitrogen and phosphorus as functional parameters. The results of a monoxenic culture experiment revealed that the initial nitrogen and phosphorus conditions determined which nutrient was critical to *Microcystis* growth. At nitrogen to phosphorus (N:P) mass ratios greater than 11, phosphorus limited cyanobacterial growth, whereas at N:P mass ratios less than 11, nitrogen was the critical nutrient.

Chen, L., Xu, Y., Dong, X., and Shen C. (2020) Removal of Intracellular and Extracellular Antibiotic Resistance Genes in Municipal Wastewater Effluent by Electrocoagulation. *Environ. Eng. Sci.* 37(12), 783-789.

The presence of antibiotic-resistant genes (ARGs) in wastewater treatment

plant effluent is of significant concern globally due to the potential for this resistance to reduce the efficacy of antibiotics, which are commonly used to treat infectious diseases. The efficacy of disinfection processes towards ARGs is limited and ARGs have been shown to persist in the environment. Chen et al. (2020) determined the efficiency of electrocoagulation (EC) for the removal of selected ARGs (sul1, sul2, tetO, and tetX) from WWTP effluent. EC achieved 1.5 – 2.6 log removal of the target ARGs with an electrolysis time of 60 min under a current density of 20.0 mA/cm² at neutral pH. Pre-treatment of the effluent with conventional UV disinfection improved the efficacy of EC. The proposed mechanism of removal of ARGs was the adsorption and enmeshment of the precipitated flocs generated by EC.

References

Deng, H., Navarre-Sitcher, A., Heil, E., Peters, C.A. (2021) Addressing Water and Energy Challenges with Reactive Transport Modeling. *Environ. Eng. Sci.* 38(3), 109-113.

National Academies of Sciences, Engineering, and Medicine. 2019. *Environmental Engineering for the 21st Century: Addressing Grand Challenges*. Washington, DC: The National Academies Press. doi: <https://doi.org/10.17226/25121>.

World Nuclear Association (2021) Plans for New Reactors Worldwide. <https://www.world-nuclear.org/information-library/current-and-future-generation/plans-for-new-reactors-worldwide.aspx> accessed April 1, 2021.

AEESP's Commitment to Justice, Equity, Diversity, and Inclusion

The Association of Environmental Engineering and Science Professors (AEESP) is committed to advancing excellence in education and research towards protecting environmental and public health. Justice, Equity, Diversity, and Inclusion are integral towards promoting the free exchange of ideas and collaborative synergy needed to achieve our purpose. Recognizing this, AEESP upholds the following principles in our personal interactions.

- Dignity. AEESP members pledge to treat other members, colleagues, students, and community members with dignity.
- Diversity and Inclusion. AEESP enthusiastically welcomes people of all backgrounds and origins. AEESP strives to provide an environment at our meetings and through our communications where all can equally participate.
- Respect. AEESP members shall promote a culture of respect in all forms of interaction with other members, colleagues, students, and community members.
- Integrity. AEESP members shall pledge to foster and strengthen our collective commitment to honesty and transparency and doing what is right, both legally and morally.
- Equity. AEESP is committed to recognizing and dismantling obstacles to achieving an equitable society.
- Justice. Through our research and education efforts, AEESP aims to empower our members and community members to secure environmental and social justice for all.

Diversity and Justice Statement

AEESP invites participation from all people, and we appreciate and value the numerous dimensions of diversity. AEESP is dedicated to promoting justice, equity, diversity, and inclusion in all aspects of research, teaching, public engagement, and professional practice. We believe that all persons should be treated with respect, dignity, and fairness in order to foster equitable participation. We will seek to eliminate systems-placed barriers to limit these goals. Diversity is a critical source of collective strength.

Societies Consortium on Sexual Harassment in STEMM

AEESP is a member of the Societies Consortium on Sexual Harassment in STEMM (Science, Technology, Engineering, Math, and Medical) fields. The mission of this group is to set standards of excellence in STEMM fields, requiring high quality research, teaching, and practice and high standards of professional and ethical conduct. Members of this consortium develop frameworks and policies to advance professional and ethical conduct in our disciplines.

AEESP Student Services Committee (SSC) Updates

AEESP Academic Job Application Review (AJAR) Program 2020.

Over the summer of 2020, the AEESP SSC successfully hosted a virtual program of faculty job application reviews for students and postdocs. The program provided the opportunity for almost 70 PhD students and postdoctoral researchers. 43 faculties from across the environmental engineering and science community volunteered as reviewers to improve the application packages. Each applicant received feedback from two faculties and peer-review from fellow applicants. The application review process was coordinated by Fabrizio Sabba (Northwestern U), Nirupam Aich (U Buffalo), Patrick McNamara (Marquette U), and Ellison Carter (Colorado State). The SSC would like to especially thank the following faculty reviewers for their service: Srijan Aggarwal (UA-Fairbanks), Onur Apul (UMass-Lowell), Bill Arnold (U Minnesota), Mohammed Baalousha (U South Carolina), Md. Aynul Bari (U Albany), Jennifer Benning (Virginia Tech), Lee Blaney (UM-Baltimore County), Stephanie Bolyard (EREF), Joe Brown (Georgia Tech), Elizabeth Butler (U Oklahoma), Doug Call (North Carolina State Univ), Jose Cerrato (U New Mexico), Mahbuboor Choudhury (Manhattan College), Jeff Cunningham (U South Florida), Jeseth Delgado Vela (Howard Univ), Jorge Estrella Gonzalez (Oklahoma State Univ) Marie-Odile Fortier (UC-Merced), Courtney Gardner (Washington State Univ), Jeremy Guest (UIUC), Sarah Jane Haig (U Pittsburgh), Niveen Ismail (Smith College), Kyoung-Yeol Kim (U Albany), Manish Kumar (UT-Austin), Phil Larese-Casanova (Northeastern Univ), Shihong Lin (Vanderbilt Univ), Zhongzhe Liu (Cal State -Bakersfield), Cresten Mansfeldt (UC Boulder), Garret McKay (Texas A&M Univ), Erica McKenzie (Temple U), Amy Mueller (Northeastern Univ), Amy Pruden (Virginia Tech), Jason Ren (Princeton), Fernando Rosario-Ortiz (UC Boulder), Joseph Ryan (UC Boulder), Matthew Scarborough (Vermont), Adam Smith (U Southern California), Lindsay Soh (Lafayette College), Sanjay Tewari (Missouri S&T), Nick Tooker (UMass-Amherst), Meng Wang (U Pittsburgh), Haoran Wei (UW-Madison), Mari Winkler (U Washington), Xing Xie (Georgia Tech). The application review process was coordinated by Fabrizio Sabba, Nirupam Aich, Patrick McNamara, and Ellison Carter.

AEESP Future Faculty Workshop 2020

The AEESP SSC organized an online workshop on August 12, 2020 where invited seminar speaker and panelist faculties discussed details about the academic job search process and relevant preparations. This virtual event was attended by >250 graduate students and postdocs. In the first hour Sanjay Tewari and Joel Burken, from Missouri S&T discussed about preparations for academic job search and application as well as the interview and negotiation process. The second part included panelists Sharon Walker (Drexel Univ), Jeseth Delgado Vela (Howard Univ), Zhongzhe Liu (Cal State-Bakersfield) and Joel Burken (Missouri S&T) who provided perspectives relevant to applying for jobs at R1, R2, and PUI universities and answered audience questions. The event was coordinated and moderated by Nirupam Aich (U Buffalo), Lauren Stadler (Rice Univ), and Sanjay Tewari (Missouri S&T). The recordings of this virtual event can be found in this link <https://www.youtube.com/watch?v=9ssWNrRZQeg&t=50s>

AEESP AJAR Future Faculty Seminar Series 2021

The AEESP SSC organized the inaugural Future Faculty Seminar Series with an aim to celebrate and highlight PhD students and postdoctoral researchers in our field, especially those who represent the emerging multidimensional diversity in our field. The seminar series ran from January to May 2021 as a biweekly event, where 14 PhD students and postdoctoral researchers (see accompanying picture on page 8) spoke about their research on diverse topics in environmental engineering and sciences. The speakers were selected by an SSC subcommittee from more than 150 AJAR applications and nominations from the community. At least 50 attendees were present in each seminar event, while more than 450 attendees registered throughout the seminar series. Along with a formal presentation at the seminar, each speaker went through an academic style mock-interview by a “search committee” and a “full interview” by a senior faculty member who also provided feedback and answered questions regarding the academic hiring process. The AEESP SSC appreciates the support from the community through seminar attendance and plans to continue organizing the seminar series in the upcoming academic year. The video recordings of the seminars can be found in the AEESP [YouTube channel](#).

The AEESP SSC would like to thank volunteer faculty members Charles Werth (UT Austin), Peter Vikesland (Virginia Tech), Jeremy Guest (UIUC), Ramesh Goel (U Utah), Andrew Whelton (Purdue Univ), and Dion Dionysiou (U Cincinnati) for their participation in the mock-interviews. The AEESP SSC subcommittee responsible for the initiative and mock-interviews included Manish Kumar (UT Austin), Nirupam Aich (U Buffalo), Lucia Rodriguez Freire (New Jersey Institute of Technology), and Jeremiah Johnson (North Carolina State Univ) with selection and logistical help from Fabrizio Sabba (Northwestern Univ), Sanjay Tewari (Missouri S&T), and Ellison Carter (Colorado State Univ).

[AEESP Future Faculty Workshop 2020 - YouTube](#)

AEESP Conference Virtual Appetizer Event: July 13, 2021

The AEESP SSC is planning a 2-hour interactive webinar on post-PhD careers for environmental engineers and scientists (EES) as a part of the AEESP Online Appetizer (July 13th). This webinar will consist of a panel discussion in the first hour on careers by 3-5 EES graduates on their career paths in academia, consulting, national labs, entrepreneurship, and others. The second hour will focus on small breakout discussion rooms on specific career pathways led by multiple volunteers representing various sectors. These webinar discussion topics and breakout rooms will be selected based on input from prospective webinar attendees.

AEESP AJAR 2021

If you are interested in receiving feedback on your faculty application, keep a look out for an announcement to join the AJAR program. It is anticipated application packages will be due July 30, 2021 and feedback will occur in August and September. We will be looking for faculty reviewers as well!

Thank you, and we look forward to seeing you all soon!

Nirupam Aich, Patrick McNamara, Fabrizio Sabba, Manish Kumar

On behalf of the AEESP SSC:

Dr. Patrick McNamara, (Chair), Marquette University

Dr. Fabrizio Sabba, (Vice-Chair), Northwestern University

Dr. Nirupam Aich, (Secretary), University at Buffalo (SUNY)

Dr. Sanjay Tewari, (Vice-Secretary), Missouri S&T University

Dr. Philip Larese-Casanova, Northeastern University

Dr. Ellison Carter, Colorado State University

Dr. Lauren Stadler, Rice University

Dr. Manish Kumar, University of Texas – Austin

Dr. Ilke Celik, South Dakota School of Mines & Technology

Dr. Sudeep Popat, Clemson University

Dr. Marie-Odile Fortier, University of California Merced

Dr. Jennifer Benning, Virginia Tech

Dr. Ramesh Goel, University of Utah

Dr. Lucia Rodriguez-Freire, New Jersey Institute of Technology

Dr. Jeremiah Johnson, North Carolina State University

AEESP AJAR Future Faculty Seminar Series 2021

Celebrating Diversity and Excellence in Environmental Engineering & Sciences



Ms. Theresa Oehmke
UC Berkeley



Dr. Mohamed Ateia
Northwestern Univ



Dr. Kiranmayi Mangalgiri
UC Riverside



Dr. Elyse Stachler
Eawag, Switzerland



Dr. Lu Liu
HARC



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Caltech



Amanda Quay ("Quay")
Stanford Univ



Dr. Mim Rahimi
MIT



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Rice Univ



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Dr. Sarah Ben Mammour
Northwestern Univ



Dr. Jenny Zenobio
UC Irvine



AEESP

Association of Environmental
Engineering & Science Professors

1963-2013: Celebrating 50 Years of Advancing Environmental Engineering & Science

Organized by
AEESP Student Services Committee

Faculty Appointments

Dr. Mohamed Ateia joins the US EPA



Dr. Mohamed Ateia will be joining the US EPA in August 2021 as environmental engineer and group leader focusing on PFAS treatment at the Center for Environmental Solutions and Emergency Response (CESER), Cincinnati, OH. He is currently a research associate at the Department of Chemistry at Northwestern University. Prior to joining Northwestern University, Dr. Ateia studied in Tokyo Institute of Technology, Japan and the University of Copenhagen, Denmark, then he completed a postdoctoral training at Clemson University. Dr. Ateia's research targets the development of new materials and techniques to adsorb and/or degrade emerging water pollutants (e.g. PFAS, DBPs, PPCPs, illicit drugs) as well as the mobility of new classes of contaminants in the environment (e.g. microplastics). His research at the EPA's Office of Research and Development will target the removal of micropollutants (mostly PFAS) and the assessment of various separation and destruction technologies from lab-scale to Superfund sites.

hagen, Denmark, then he completed a postdoctoral training at Clemson University. Dr. Ateia's research targets the development of new materials and techniques to adsorb and/or degrade emerging water pollutants (e.g. PFAS, DBPs, PPCPs, illicit drugs) as well as the mobility of new classes of contaminants in the environment (e.g. microplastics). His research at the EPA's Office of Research and Development will target the removal of micropollutants (mostly PFAS) and the assessment of various separation and destruction technologies from lab-scale to Superfund sites.

Dr. Sara Beck joins Department of Civil Engineering at University of British Columbia



Dr. Sara Beck (she/her) joined the Department of Civil Engineering as an assistant professor at the University of British Columbia in April of 2021 with a research group focused on understanding and preventing pathogen transmission at the confluence of public health, water quality and innovative water treatment solutions. She and her students use microbiology tools to improve water treatment and reuse processes and bridge the gap between knowledge and practice. Prior to joining

UBC, Dr. Beck evaluated cost-effective decentralized water reuse technologies at the Asian Institute of Technology near Bangkok, Thailand and at the Swiss Federal Institute of Aquatic Science and Technology (Eawag) near Zurich, Switzerland.

Dr. Beck earned her Ph.D. in Environmental Engineering from the University of Colorado (CU) Boulder in 2015. Her dissertation on Wavelength-Specific Effects of UV Light on Microorganisms and Viruses for Improving Water Disinfection received the Outstanding Doctoral Dissertation award by AEESP in 2016. She received an M.S. in Environmental Engineering from Georgia Tech and a B.S. / B.A. in Aerospace Engineering / Studio Art from CU Boulder.

Dr. Kristian Dubrawski joined University of Victoria as a Canada Research Chair.



Prof. Kristian Dubrawski, assistant professor of civil engineering at University of Victoria, is a specialist in water quality and technology, intersecting with community and ecological health. His Ph.D. was at UBC in Chemical/Biological engineering with RES'EAU WaterNet on drinking water in rural and Indigenous communities, and post-doc at Stanford on small-system wastewater energy, nutrient, and carbon resource recovery. He is currently leading projects related to nature-based water reuse (specifically microbial electrochemical technologies in wetlands for COD removal without depleting dissolved oxygen), and a community-led toolkit for nature-based solutions for climate and water security. He is a determined optimist in the struggle for environmental justice and the rights of nature and seeks collaborative transformations in economic and innovation systems towards this goal.

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Fulbright at 75: Science-for-diplomacy, now more than ever

Daniel B. Oerther, Ph.D.

Missouri University of Science and Technology

On August 1, 1946 President Harry S. Truman signed the Fulbright Scholarship Program (1) into law, and seventy-five years later Fulbright is known world-wide as America's flagship program for international exchange bringing roughly 4,000 students and 1,000 faculty to the United States and supporting the outbound travel of nearly 2,000 students and 1,000 faculty. While the likelihood of receiving an award varies among disciplines and countries, a typical rate of annual success is approximately 20% of applicants are funded. I've learned that Fulbrighters are first-and-foremost cultural ambassadors. For those who understand funding from the National Science Foundation, I use the analogy that Fulbright places primary emphasis on the "broader impacts" of your application. When you apply, I suggest you stress that your participation is because you want to serve as a cultural ambassador, that your institution and loved-ones are fully supportive, and that you have some – but not too much – prior exposure to the country you intend to visit. The Fulbright Program is an example of "science-for-diplomacy" (2)

where scientific cooperation can improve international relations. Fulbright is conducted through bilateral arrangements between the United States and roughly 160 countries around the world, and it could be characterized as an "action primarily designed to meet global needs and challenges" (3) as it was created in the aftermath of World War 2 to achieve peace. Although the ambitious objective of Fulbright is global cultural awareness, I am inspired when I reflect on the fact that the program's namesake, Senator J. William Fulbright, was born in the tiny Missouri town of Sumner. Within AEESP, we recognize global outreach with the annual Steven K. Dentel Award. Professor Dentel was instrumental establishing the student chapter of Engineers Without Borders at the University of Delaware. As I myself am a three-time Fulbrighter (India, 2005; Brazil, 2012; and United Kingdom, 2019), a recipient of the Dentel Award, and currently a member of the Board of Directors of EWB-USA, I invite everyone in AEESP to leverage opportunities such as Fulbright to engage globally because it is through working together

that we have the greatest opportunity to restore, protect, and preserve our environment as a cultural heritage for everyone for all time.

(1) U.S. Department of State, Bureau of Educational and Cultural Affairs. "The Fulbright Program, Frequently Asked Questions." Available: <https://eca.state.gov/fulbright/frequently-asked-questions>. Last accessed May 5, 2021.

(2) Royal Society and American Association for the Advancement of Science. "New Frontiers in Science Diplomacy." Available: <https://royal.society.org/topics-policy/publications/2010/new-frontiers-science-diplomacy/>. Last accessed May 5, 2021.

(3) Turekian, V.C., Gluckman, P.D., Kishi, T., and Grimes, R.W. 2018. "Science Diplomacy: A Pragmatic Perspective from the Inside." *Science & Diplomacy* 6(4). Available: <https://www.sciencediplomacy.org/article/2018/pragmatic-perspective>. Last accessed May 5, 2021.



Oerther visiting Sumner, Missouri in autumn 2019 and stopping at the local Fulbright Museum.

Final Project Report: Connecting Environmental Engineering Applications to the High School

Advanced Placement (AP) Chemistry Curriculum at Palmyra Area High School PI: Brenda Read-Daily, Ph.D., Elizabethtown College

This project involved visiting Palmyra Area High School's Advanced Placement (AP) Chemistry class to teach students about nitrogen cycle management and water hardness. Throughout three class sessions, high school students:

1. completed work relating the AP Chemistry topics of redox chemistry and thermodynamics to nitrogen management and water hardness
2. tested water samples for nitrate and hardness
3. learned about environmental engineering applications.

This project reinforced concepts learned as a part of their AP Chemistry course. In particular, students explored how redox chemistry and thermodynamics are used when managing the nitrogen cycle and how water hardness is treated in water treatment systems. These principles directly connect to the AP Chemistry curriculum: Unit 4 Chemical Reactions, Unit 8 Acids and Bases, and Unit 9 Applications of Thermodynamics [1]. The AEESP Foundation Grant provided the funds necessary to purchase supplies for the hands-on activities: a colorimeter, sample vials, and filters.

Background

Every year Advanced Placement (AP) exams are offered near the end of the academic year, usually in early May. As is the case for most schools, Palmyra Area High School's academic year continues until early June, leaving approximately one month for additional classroom instruction post-

exam. This time is typically used to review topics covered earlier in the school year. Therefore, it presents an opportune time for students to learn how chemical principles are used in environmental engineering.

AP Chemistry students represent an ideal target group for environmental engineering due to their interest in science and academic achievement. The students taking AP Chemistry are juniors or seniors and are, and many are considering science-related college majors. These students have laboratory experience and possess skills in collecting and analyzing data.

Project Goals

The goals of this project were to (1) teach AP Chemistry students about the environmental engineering field and how it connects to their chemistry studies (2) create a unique model that other environmental engineering professors can use to conduct similar outreach to their local high schools.

Implementation

Before the COVID-19 pandemic hit, Dr. Read-Daily worked with one of her students to develop handouts to use in the classroom with the high school students. That student had completed Introduction to Environmental Engineering and Water and Wastewater Engineering courses. She had also taken AP Chemistry in high school and was familiar with the topics covered in that curriculum. She worked with her professor to create

two handouts with solution sets covering redox chemistry and thermodynamics in the nitrogen cycle and water hardness calculations. The high school teacher later reviewed these handouts to ensure the content was on-level and aligned with the AP Chemistry curriculum.

The original plan for the project was to visit the AP Chemistry class in May 2020 in-person and conduct hands-on activities. As a result of the COVID-19 Pandemic, the class switched to asynchronous remote learning. Dr. Read-Daily and AP Chemistry teacher worked together to adapt the activity for virtual learning. As a modification, Dr. Read-Daily recorded a video introducing environmental engineering, nitrogen cycle management, and how AP Chemistry topics connect to the field. In addition, she provided handouts that were used as assignments by the AP Chemistry teacher.

In 2021 the AP Chemistry class had remote and in-person learners. Dr. Read-Daily was not allowed to visit the high school in-person, so the activity was adapted so that the teacher could implement the hands-on component in class without the in-person support of Dr. Read-Daily. Dr. Read-Daily collected five water samples and dropped off the activity materials with the teacher. Dr. Read-Daily also instructed the AP Chemistry teacher on how to use the colorimeter and water hardness kits.

In addition to the water samples provided by Dr.



Figure 1. (a) students measure nitrate concentration of water sample using a colorimeter



(b) student prepares a sample for measuring hardness

Read-Daily, the teacher also invited his students to bring their own water samples to test as well. During the hands-on class, students measured nitrate using a colorimeter (Figure 1a) and water hardness using a titrant kit (Figure 1b). The students did not know in advance which sample was which and had to make educated guesses and providing rationale based on the data they collected.

During a later class, the professor talked with the class virtually, discussing nitrogen cycle management and the lime/soda ash and ion exchange water softening. This virtual class visit served to close the loop on the activities and allow for the students to ask questions and interact with the environmental engineering professor.

Conclusions

Despite the challenges presented by the COVID-19 Pandemic, this project was successfully implemented with modifications over two years. The students demonstrated a high level of engagement with the project. The students particularly enjoyed the hands-on activities and asked thoughtful questions about the field of environmental engineering, the hands-on activities, and the nitrogen cycle. Consequently, the teacher invited Dr. Read-Daily to return next year and complete the activities again. This project highlights the possibilities of outreach to high school AP science courses. While this project examined an outreach activity with an AP Chemistry course, AP Environmental Science or AP Physics courses also connect to environmental engineering and

should be considered as well. Future work will involve exploring additional topics such as chemical and biochemical kinetics. Also, Dr. Read-Daily will seek additional opportunities to share these activities with other AP Chemistry classes in the region.

Acknowledgment

A special thanks to the AEESP Foundation for providing the funds necessary to support this outreach activity.

Reference

[1] College Board, "AP Chemistry," 2021. [Online]. Available:

<https://apstudents.collegeboard.org/courses/ap-chemistry>. [Accessed 24 May 2021].

Dr. Menachem Elimelech Named Sterling Professor at Yale

Dr. Menachem (Meny) Elimelech, Professor in the Department of Chemical and Environmental Engineering at Yale University, has been named Sterling Professor. The Sterling Professorship is awarded to a faculty member at Yale considered one of the best in his or her field and is one of the university's highest faculty honors. Meny is the first from an engineering department at Yale to be named for this professorship since its establishment in 1920.

Meny began his academic career in the Department of Civil and Environmental Engineering at UCLA. Upon coming to Yale in 1998, he founded Yale's Environmental Engineering Program. The program has been ranked in the top 10 of the U.S. News & World Report's Graduate Engineering Rankings for the past six years.

Meny received major awards in recognition of his research. Especially notable are the Eni Award for Protection of the Environment in 2015, election to the National Academy of Engineering in 2006 and the Chinese Academy of Engineering in 2017, and the Clarke Prize in 2005.

Meny has advised 43 Ph.D. students and 37 postdoctoral researchers, many of whom now hold leading positions in academia and industry. In recognition of his excellence in teaching and mentoring, Meny received the Yale University Graduate Mentoring Award in 2004 and the Yale University Postdoctoral Mentoring Prize in 2012.



ASDC for Windows: Air Stripper Design and Costing (Version 1.0)

David Dzombak, Muhammad Sherif, Nimit Shah, Vishal Vaidyanathan, Hung-Jung Fang, Sujoy Roy

ASDC for Windows is an interactive program for air stripper design and cost estimation and optimization. For a specified water treatment scenario, the Air Stripper Design and Costing (ASDC) program can generate many alternative designs with estimates of capital and operating costs for each design. Various plots of costs versus design parameter values can be then generated and displayed on-screen for rapid assessment of optimal design with respect to cost.

The ASDC program was originally developed at Carnegie Mellon University in the early 1990s under contract to the Air Force Civil Engineering Support Agency for use with the DOS operating system. The program has been adapted for use with the Windows operating system.

ASDC for Windows is available for free download at:

https://kilthub.cmu.edu/articles/software/ASDC_for_Windows_Air_Stripper_Design_and_Costing/14474007

The downloadable ASDC V1.0.exe setup file installs the program and related files, including a detailed user manual.

The developers are not able to provide user support, but any problems with the software or suggestions for its improvement may be sent to: cmu.asdc@gmail.com

The ASDC for Windows program is available for open access non-commercial research use. Carnegie Mellon University allows free use of the ASDC software in its "as is" condition.

17th IWA World Congress on Anaerobic Digestion

We are pleased to invite you to the 17th World Congress on Anaerobic Digestion to be held at the University of Michigan in Ann Arbor, Michigan, USA from June 19-22, 2022. This international conference supported by the IWA Anaerobic Digestion Specialist Group is an event to discuss recent advances in anaerobic digestion and related processes. The theme of the 17th World Congress on Anaerobic Digestion is "Biogas and Beyond: Expanding Applications of Anaerobic Biotechnologies in a Circular Economy." The event is co-chaired by Lutgarde Raskin (University of Michigan) and Adam Smith (University of Southern California). Abstract submissions opening late fall 2021 with the conference website coming soon!





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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.

Rank	Annual Fee*
Full Professors	\$110
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Assistant Professors	\$ 55
Students and Post-docs	\$ 15

Members residing in low and middle income countries as identified by the World Bank may request a discount by contacting the Business Office.

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Affiliate Membership is open to individuals who are not eligible for regular membership including:

- Individuals primarily employed outside academia who also hold academic appointments in an environmental engineering or related academic program (e.g. adjunct faculty).
- Individuals primarily employed outside academia who have made contributions to education in environmental engineering or related fields.
- Educators in environmental engineering or related fields who are employed at junior colleges or other educational institutions that do not offer the degrees specified above.
- Individuals who were members at one time and who have retired from active teaching.

Application for Affiliate membership is the same as for regular membership. The annual dues for Affiliate members are \$65.

Sustaining Membership

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.

Annual dues for Sustaining Members are \$500. Organizations or individuals desiring more information on Sustaining Membership should contact the Business Office at the phone number below.

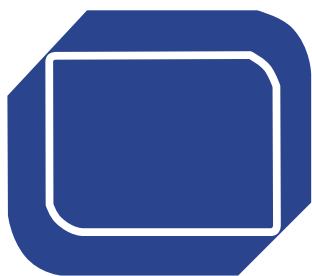
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More information can also be obtained from the AEESP Business Office:

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