

AEESP Newsletter

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Need to renew your 2023 AEESP membership? Go to "Membership > Renew My AEESP Membership" on the AEESP Website: 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 February 2024.

President's Letter

By Debora Frigi Rodrigues, Ph.D.
University of Houston



It is an honor to be here writing to all of you, and paraphrasing Sir. Isaac Newton, if I am here today, it is because I stood on the shoulder of giants. Giants like my teachers and mentors, and every AEESP

member that came before me. Therefore, first and foremost, I would like to heartfully thank our members for electing me for the board and the board for entrusting me with the presidency! It is truly a great pleasure and honor to serve our organization!

I joined the board in 2020, during my tenure on the board I had the greatest pleasure to work and learn from our former AEESP presidents, including Joel Ducoste, Bill Arnold, and Allison Mackay. In 2021, we defined a strategic plan that has been leveraged by our past presidents. Some of the key goals in that plan focus on growth, diversification, globalization, and internationalization of our organization. To build on these goals, we are planning to: develop our members' partnerships; expand our membership to different fields within environmental engineering and science and; grow and diversify our membership to meet the current job market needs.

These goals are very timely since our society, membership, and current career pathways of our students have been changing over the years and we need to stay on top of these changes to continue to provide an outstanding service to our members.

During my presidency, I plan on working on three aspects of our strategic plan with the assistance of the Board and the Committees, namely:

1. Develop Members' Academic Networks by Increasing Partnerships

When I went to college back in Brazil, I had the opportunity to go conduct research in a poor community and collect water samples from wells. This community was known to be plagued by high child mortality due to water contamination because the septic tanks were built very close to the freshwater wells and therefore there was cross-contamination of their drinking water. That was a moment that changed my life. Seeing the impact of the lack of resources, infrastructure, technology, and education on the face of children and adults in that community made me realize that something needed to be done and I wanted to be part of the solution. I finished my undergraduate studies and decided to pursue a master's and doctoral degree education to be able not only to teach but also to research solutions and help communities like that.

I knew since the beginning that I wanted to go to academia. Back then, in the 90s, pursuing a career in academia was much easier. Some people could get positions as soon as they finished their doctorate or after just one year of postdoctoral experience.

Now the job market has changed for academic positions. The number of academic positions has not increased as much as the number of doctorate students graduating. On the other hand, the industry has been absorbing most of our graduates. As shown in the 1989 to 2020 NCSSES reports from NSF, industry hiring of Ph.D. graduates increased from 55.5% to 75.8%, while academia went down from 29.9% to 11.6% over this same period. By acknowledging the role of industry and our sustaining members in the engineering career path, our organization can continue to improve

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our services and activities to better serve our Ph.D. students and postdocs that are part of our membership.

In addition to the changes in the career paths of our graduate students, funding opportunities have also been evolving. A couple of years ago, NSF created a new directorate called "Technology, Innovation and Partnerships" (TIP). Because of this new directorate and the Chips and Science Act, NSF received a 12% budget increase from Congress. This increase is the largest in the past two decades. The TIP directorate aims to build tomorrow's innovation workforce. This budget increase will allow the support of more than 35,000 scientists compared to 2022. This funding will expand NSF's portfolio to develop user-inspired and translational research. To successfully access these funding opportunities, partnerships with industry or non-governmental agencies are necessary.

Hence, there is a clear need for our organization to further increase partnerships with industry, non-profits, and other organizations. This expansion and growth in partnerships will generate diverse benefits for our members ranging from new funding sources to mentorship programs, and new forms of collaboration between industry and academia, ultimately benefiting our members and society in general.

2. Expand our Membership to Different Fields of Environmental Engineering and Science

Another key theme identified in our strategic plan exercise was the need to expand our membership to different fields within environmental engineering and science. Historically, our membership was mainly dominated by the water and wastewater fields. Over the years, the environmental science and engineering field has evolved, and different areas have emerged. The membership and demographics committee under the leadership of Lee Blaney, our Vice president, developed a membership survey, the results showed that we still have 52% of our organization involved in water and wastewater fields. But it is important to acknowledge that other areas are growing, and we need to be inclusive and further expand into these areas.

During the strategic plan, the participants identified a list of potential areas, which are not exhaustive, to be considered for invitation to join our organization. These potential future members are researchers or academicians from public & environmental health, ecosystem engineering, social scientists involved in environmental public policies, environmental geoscientists, EPA, NIST, USDA scientists, and academic research staff. We should seek to engage and attract these new members in different fields of environmental science and engineering to expand our membership.

By expanding our membership, we hope to become THE reference organization for environmental engineering and science professionals in the US and abroad. One important outcome of diversifying the fields in our membership is that we will also expand the breadth of knowledge in our discipline to better train and educate the next generation of students. Also, this will increase our members' network in research, community, and other scholarly activities. By increasing our membership, we will also increase the impact and reach of our organization in society. Hence, several benefits will arise from this new direction.

3. Grow and Diversity the Membership to be more Inclusive

Diversity, equity, and inclusion are concepts that have been around for decades, but it was only more recently that academic institutions around the nation began to genuinely address some of the inequities pervasive in academia.

As an organization that has a large membership of faculty members and researchers from academia, we cannot ignore the need to implement measures to ensure diversity, equity, and inclusion. The AEESP should be a home for all people independent of race, origin, or personal beliefs. Our voices are louder together!

This need was further corroborated by the results of the survey results obtained by the membership and demographics committee under the leadership of Lee Blaney which showed that currently we still have an imbalance in our membership, since about 52% are white, followed by Asians with about 24% of our members. We still have room to improve our membership, which is only 7% of US Latinos and 4% of African Americans, and other minorities. I would also like to point out that only 6% of our members are not based in the United States.

Based on graduation numbers from US schools, the demographics of our organization do not represent the profile of the graduates in the United States. Therefore, we do have an opportunity here to attract more talent and have a better representation of the different groups in our society.

Considering these data, one goal in my tenure as president will be to create a workgroup or a new committee of Outreach, Liaison, and International Affairs to engage with minority organizations as well as support international growth. Also, through this committee, we will be able to share best practices for successful strategies for the recruitment and retention of minorities. Through this new committee, we will be able to create and support programs and opportunities for minorities and international faculty, and communities. We also want to promote and sponsor these communities as keynote, guest, and seminar speakers to share their perspectives and practices to ensure that they feel included and belonging to our organization.

I believe that with these new initiatives, we will be able to expand, grow and diversify our membership to better serve our community and society. However, we need your help to make this happen. We will need your assistance with new initiatives that we will be launching to help us expand our membership, diversity, and partnerships. If each member brings two or more new members from your institutions or collaborators, we will be giving you a "super COOL mug". If you bring a new sustaining member, from industry, non-governmental organizations, or others, you will get a one-year free membership!

Help us make this organization more inclusive and diverse!

Also, please consider donating to the AEESP awards and joining one of our committees. Your participation in our organization is essential for our success. If you have suggestions and ideas to improve our services, please feel free to contact me or any member of the board. If you want to actively participate in any committee, please do reach out to the chairs of the committees! That's how I first got involved in the AEESP organization... by reaching out to Karl Linden. He gave me the opportunity to initiate my services at the AEESP organization and I never left.



Debora Frigi Rodrigues, Ph.D.
AEESP President, 2023-2024

Results from the 2022-2023 Member Demographics Survey

By Lee Blaney, Allison MacKay, Debora Rodrigues, and Kara Nelson

In November 2022, the Board partnered with the Membership and Demographics Committee to launch a new 14-question demographics survey at the time of membership renewal. The survey was developed using best practices learned through our engagement with ACCESS+ (<https://accessplusstem.com/>), which is an NSF ADVANCE funded partnership that aims to improve diversity, equity, and inclusion in professional societies. Seven questions were related to professional information, two questions focused on participation in AEESP, four questions involved personal demographics, and the last question was a write-in prompt about whether other aspects of personal or professional identities should be included in future surveys. The survey was designed to ensure confidentiality, but members were also able to select "prefer not to say" and "prefer to self-describe" options.

The drivers for this survey were to (i) determine which institution types, research areas, and roles are well- and under-represented in AEESP, (ii) improve understanding of the personal demographics of environmental engineers and scientists, and (iii) highlight opportunities for engaging and recruiting new members. The survey results will also inform programming and recruiting efforts, encourage more engagement in AEESP, and help the Association to be more inclusive of our 950+ members. In fact, the

Board has already considered the demographics data when making decisions about future initiatives. After seeing the preview of these data at the 2023 AEESP Research and Education Conference in Boston, members expressed appreciation for having their professional interests and personal identities affirmed by our Association. To ensure transparency and assist with the work of individual members and AEESP committees, the aggregate survey data will be reported each fall.

We want to thank the following members for contributing to the development of the survey: William Arnold; Tarek Aziz; Lauren Beckingham; Ro Cusick; Nicole Fahrenfeld; Donna Fennell; Claudia Gunsch; Ramanitharan Kandiah; Lupita Montoya; Mira Olson; Rouzbeh Tehrani; Matthew Verbyla. The Board also acknowledges Brian Schorr (AEESP Executive Administrator) and Mandy Ferguson (AEESP Website Designer) for their assistance deploying the survey into the membership renewal website.

Below, you can find the survey responses recorded from November 2022 to September 2023. To ensure confidentiality, categories selected by less than 1% of the 340+ respondents were labeled as "< 4". If you have any questions, please feel free to reach out to Lee Blaney (blaney@umbc.edu).

Professional Information

1. Describe your employer? (select all that apply)	Responses
Academic institution	357
Industry, consulting firm	< 4
Government agency or national laboratory	8
Nonprofit or nongovernmental organization	4
Self-employed	< 4
Not currently employed	6
Prefer not to say	< 4
Prefer to self-describe	7
Total respondents = 373	Total responses = 387

2. If you work at an academic institution, which type do you work at? (select all that apply)	Responses
Asian American and Pacific Islander Serving Institution	11
Associate's College (Community College)	< 4
Doctoral University: Very High Research Activity (R1)	268
Doctoral University: High Research Activity (R2)	37
Doctoral/Professional University (R3)	15
Hispanic Serving Institution	17
Historically Black College and University	4
International institution (not based in the United States)	12
Master's College or University	9
Minority Serving Institution	10
Predominantly Undergraduate Institution	25
Predominantly White Institution	14
Tribal College and University	< 4
Unknown	< 4
Prefer not to say	9
I do not work in an academic institution	8
Total respondents = 373	Total responses = 441

3. If you work at an academic institution, what undergraduate degrees does your department administer? (select all that apply)	Responses
Environmental Engineering	157
Civil Engineering	183
Civil and Environmental Engineering	99
Chemical Engineering	63
Construction Engineering	27
Environmental Science	50
I am not in an academic institution	7
Prefer not to say	8
Prefer to self-describe	40
Total respondents = 373	Total responses = 634

4. If you work at an academic institution, what graduate degrees does your department administer? (select all that apply)	Responses
Environmental Engineering	165
Civil Engineering	172
Civil and Environmental Engineering	95
Chemical Engineering	61
Construction Engineering	17
Environmental Science	48
I am not in an academic institution	7
Prefer not to say	11
Prefer to self-describe	45
Total respondents = 373	Total responses = 621

5. Which media do you focus on in your research or professional activities? (select all that apply)	Responses
Air	51
Built environment	< 4
Energy	80
Food	41
Soil/sediment	96
Water/wastewater	332
Prefer not to say	6
Prefer to self-describe	21
Total respondents = 373	Total responses = 627

6. What types of research do you focus on? (select all that apply)	Responses
Community engaged	85
Educational/teaching	76
Experimental	320
Modeling/computational	167
Prefer not to say	4
Prefer to self-describe	8
Total respondents = 373	Total responses = 660

7. What type of position do you hold? (select all that apply)	Responses
Tenured/tenure track faculty (assistant professor)	70
Tenured/tenure track faculty (associate professor)	52
Tenured/tenure track faculty (full professor)	82
Research faculty (not tenure track; assistant level)	4
Research faculty (not tenure track; associate level)	< 4
Research faculty (not tenure track; full level)	< 4
Clinical or teaching faculty (not tenure track; assistant level)	6
Clinical or teaching faculty (not tenure track; associate level)	< 4
Clinical or teaching faculty (not tenure track; full level)	< 4
Adjunct faculty	5
Emeritus faculty	15
Retired	9
Postdoctoral researcher	54
Graduate student (MS level)	5
Graduate student (PhD level)	62
Administrator (e.g., chair, center director, dean, provost, etc.)	32
Government agency or national laboratory	< 4
Industry or consulting	< 4
Nonprofit or nongovernmental organization	< 4
Prefer not to say	4
Prefer to self-describe	< 4
Total respondents = 373	Total responses = 417

AEESP Participation

8. Do you serve on any AEESP committees?	Responses
Yes	47
Not now, but I have in the past	51
No	255
Prefer not to say	6
Total respondents = 359	Total responses = 359

9. Have you held any leadership positions in AEESP? (select all that apply)	Responses
Yes, I have served on the Board of Directors	34
Yes, I have chaired an AEESP committee	37
No	297
Prefer not to say	7
Total respondents = 359	Total responses = 375

Personal Demographics

10. Which of the following most accurately describes your gender? (select all that apply)	Responses
Cisgender	31
Female	140
Intersex	< 4
Male	177
Non-binary	< 4
Transgender	< 4
Prefer not to say	15
Prefer to self-describe	< 4
Total respondents = 342	Total responses = 369

11. Which of the following most accurately describes your race and ethnicity? (select all that apply)	Responses
African American/Black	18
Asian American/Asian	98
Hispanic/Latino/a	25
International (not based in the United States)	22
Middle Eastern/North African	< 4
Native American/Alaskan Native	< 4
Native Hawaiian/Other Pacific Islander	< 4
White	184
Prefer not to say	15
Prefer to self-describe	< 4
Total respondents = 342	Total responses = 370

12. Do you have a disability?	Responses
Yes	9
No	309
Prefer not to say	24
Total respondents = 342	Total responses = 342


13. Which of the following most accurately describes your sexual orientation? (select all that apply)	Responses
Asexual	8
Bisexual	9
Gay	6
Heterosexual or straight	267
Lesbian	< 4
Pansexual	< 4
Queer	6
Questioning	< 4
Prefer not to say	49
Prefer to self-describe	< 4
Total respondents = 342	Total responses = 350

AEESP LGBTQ+ Virtual Coffee Hour

When: Wednesday, October 25 @ 1 pm ET / 10 am PT

Where: Join our listserv for an e-mail with Zoom info:
<https://forms.gle/28otTXTKV8ZVdnpY6>

This event is hosted by Dr. Juliet Johnston and Dr. Christopher Olivares. They will try to hold virtual gatherings every 3-4 months and plan more gatherings based on community feedback!



Report from the Autumn 2023 AEESP Board Meeting

Dr. Kara Nelson, AEESP Vice President, University of California, Berkeley

The AEESP Board of Directors convened in person from September 6-8, 2023, at Drexel University in Philadelphia for our fall meeting. Prof. Mira Olson (Secretary) was our above-and-beyond host. Thank you Mira! The meeting ran very smoothly, we accomplished a lot, and we also enjoyed hanging out with each other in Philly. At the fall meeting, outgoing and incoming Board members overlap to ensure a smooth transition. We welcomed our three new Board members: José Cerrato, Judy Zhang, and Belinda Sturm. Officer Elections were held by secret ballot, and the following Board members were elected to Officer positions: Claudia Gunsch (Chief Technology Officer), Donna Fennell (Treasurer, *effective January 1, 2024), and Kara Nelson (Vice President). Lee Blaney was confirmed at President Elect, and Susan Masten continues for one more year as Chief Information Officer. We are indebted to the contributions of our three outgoing Directors: Junko Munakata Marr (Chief Technology Officer), Treavor Boyer (Treasurer, *through December 31, 2023), and Allison MacKay (President). Allison presided over the first meeting day. Debora Rodrigues assumed the role of President and presided over the second day.

On the first day, Brian Schorr (Executive Administrator) provided the Business Office report. Our membership

continues to be steady, with 955 members in good standing. However, it's important to note that the growth of our Sustaining Membership is currently a top priority. Debora (President) will work with the Board to further develop our value proposition and better understand the ways we can provide mutual benefit. We discussed whether to bring back curriculum resources that were available to members on the old website (this content was not translated to the new website, which launched in 2022). The Board feels that there would be value in providing a mechanism for members to share curriculum materials and tasked the Education Committee with following up on this issue. Requests for the lab manual (available on CD) can be made directly to Brian Schorr. The Board approved sponsorship of the Gordon Research Seminar on Environmental Sciences: Water in summer 2024. To ensure that AEESP resources are equitably distributed to efforts in which our members are engaged, the Board organized a Task Force to develop a more formalized process for soliciting requests for AEESP to sponsor conferences, workshops, and symposia in the future. Treavor Boyer provided the Treasurer's report. One important source of revenue is job postings for open faculty positions. We agreed to solicit data on website traffic that can be used to encourage our members to post jobs on our website.



Left to right: Judy Zhang, José Cerrato, Belinda Sturm, Donna Fennell, Junko Munakata Marr, Mira Olson, Debora Frigi Rodrigues, Brian Schorr, Allison MacKay, Claudia Gunsch, Lee Blaney, Kara Nelson, Susan Masten (Not pictured: Treavor Boyer)

The Board had a series of discussions related to the AEESP biennial conference, including video meetings with the hosts of the 2023 conference (Phil Larese-Casanova and Amy Mueller) and the chair of the Conference Site Selection Committee (Josh Sharp). Based on a survey of participants from the 2023 conference, 92% were satisfied or very satisfied. Valuable input was gathered about which conference elements were especially successful and where there is room for improvement; this input will be shared with the Site Selection Committee and the next conference hosts. The Board requested that a Conference Vision component be added to the pre-proposal process (for hosting the next conference), to describe how the mission of AEESP will be furthered by hosting the event. We look forward to receiving strong proposals and hearing the outcome of the site selection process!

Jennifer Becker, Chair of the AEESP Foundation, joined us via video to provide an update. The Foundation will be re-starting the mini-grant program, following a survey and review of its effectiveness from previous grant-recipients. Rather than awarding five grants annually at \$2,000 per grant, there will be two grants awarded annually at \$5,000 per grant. Also, there will be an open seat on the Board beginning on January 1, 2024. Please consider serving in this capacity! Stay tuned for the request for nominations.

Susan Merther from the Water Environment Federation joined us via video to discuss ways for AEESP to show greater visibility at WEFTEC. We (and WEF) are open to ideas on events to replace the now discontinued Scientists' Lunch. For those attending WEFTEC this year, we hope you were able to participate in the Master Lecture, delivered by newly-elected Board member Belinda Sturm on October 2, and the Meet and Greet on October 3 hosted by Debora (President).

On the second day, Debora outlined her vision and priorities for the year to come. In particular, she will prioritize three themes from the AEESP Strategic Plan: (1) Build new partnerships to benefit our members; (2) Expand our membership to more subfields within environmental engineering and science; (3) Grow and diversify the membership to meet current job market needs. To help address these priorities, the Board approved two new Task Forces. The goals of the Outreach and Liaison Task Force include developing a more diverse pipeline of environmental engineers and better supporting our members from under-represented groups. The goals of the International Affairs Task Force include identifying opportunities to partner with similar organizations in other countries to bring more international perspectives and opportunities to our members. Each Task Force is charged with further refining the charges and could lead to formation of a permanent committee. If you are interested in learning more about either of these Task Forces, and serving on them, please contact Debora (dfrigiro@central.uh.edu). Debora also presented ideas for how each of our committees can grow their impact. These ideas will be shared with the committee chairs by Debora. The Board also approved new Liaisons for each committee, to serve as a resource to help them to effectively carry out their charges.

Respectfully reported by Kara Nelson.



AEESP Foundation Seeks Self-Nominations of Prospective Board Members

Nomination Deadline: 11:59 pm ET (US), November 15, 2023

The work of the AEESP Foundation (<https://aeesp-foundation.org>) is directed by a six-member Board. Members serve three-year terms. Each year, two members are elected to the Foundation Board. One of these new members is nominated by, and serves concurrently on, the AEESP Board of Directors, and moving forward, one member will be elected annually from the general AEESP membership.

We are currently inviting self-nominations from the AEESP community for a new member who will serve on the Foundation Board from January, 2024 through December, 2026. This Board member will have the opportunity to become familiar with the workings of the Board during 2024 and the role of the Chair during 2025. It is our intention that this Board member will be elected Chair of the Foundation during the third year of their term.

If you are interested in serving on the Foundation Board in this capacity, please send an approximately 200 word explanation of why you wish to serve on the Foundation Board

and a summary of your past involvement with AEESP. We are looking for Board members with a strong history of involvement with, and service to, AEESP; the ability to dedicate the time needed to complete the work of the Foundation; and strong organizational/leadership skills. Self-nominations should be sent via email to Jennifer Becker (jgbecker@mtu.edu), the current Chair of the AEESP Foundation by 11:59 pm (EST) on November 15, 2023. Please direct to Jennifer, any questions you have about this specific opportunity or the AEESP Foundation in general.

About the AEESP Foundation: The AEESP Foundation is a Section 501(c)(3) tax-exempt organization that works to enhance the public outreach and education efforts of AEESP members and to bring new knowledge in environmental engineering and science to the public. The Foundation accomplishes this mission, in part, by managing and administering the financial resources needed to support the AEESP Distinguished Lecturer Series and AEESP Awards.

AEESP Foundation Seeks Applications for Educational Grants

Submission Deadline: 11:59 pm ET (US), November 7, 2023

The mission of the AEESP Foundation is to improve the state of knowledge in environmental engineering and science through the support and encouragement of excellence in education, outreach, and scientific research. The AEESP Foundation supports projects that enhance the general public's awareness and understanding of environmental engineering and science and the role of environmental engineers and scientists in addressing environmental problems at local and global levels. Applications will generally be reviewed twice per year by the AEESP Foundation Board.

Grant-making Mission. The AEESP Foundation provides one-year monetary grants that enable individuals and/or organizations to utilize expertise garnered from research and teaching at the university level to inform K-12 instruction, with the goal of increasing students' awareness and understanding of environmental engineering and science issues and solutions. A maximum of two grants of up to \$5,000 each will be awarded each year.

Grant Application Requirements. Applications should be submitted electronically by 11:59 pm on November 7, 2023 via the AEESP Foundation website at <https://aeesp-foundation.org/grants>.

Applications shall comprise a brief cover letter and a project description. The cover letter should contain the following information:

- Project title
- Name of principal investigator
- Name of organization
- Organization's address
- Name of organization's contact
- Email address for organization's contact
- Organization's tax status
- Organization's mission

The project description should be a maximum of 5 pages (single-spaced, 12 pt. Times New Roman font) and must include the following information:

- Description of project team, including any K-12 educational partners
- Overall project goal and objectives/ tasks
- A description of the proposed activities
- Project impacts, including number and demographics of K-12 students that will be impacted
- Project timetable (one-year unless requested otherwise)
- Any plans to continue the proposed educational/outreach activities after the grant has ended
- An indication of your willingness to share educational resources developed through the AEESP Foundation grant with AEESP members

Selection Criteria. Grant proposals will be evaluated based on the following criteria:

- Contribution to the grant-making mission of the AEESP Foundation
- Expected impact: number of people served, age appropriateness of proposed activities, and feasibility of completing proposed activities with the project team
- Clarity of budget and proposal for the proposed work
- Potential to continue activities after the AEESP Foundation grant and share educational resources after the project has ended

Grant Eligibility. Tenure-track and tenured faculty, research professors, and teaching professors/lecturers working in the environmental engineering and science areas are eligible to serve as principal investigators (PIs). Questions about PI eligibility or other aspects of the grant proposal requirements should be directed to AEESP Foundation Chair, Jennifer Becker at jgbecker@mtu.edu.

Award Deliverables. Following the completion of an AEESP Foundation project, grant recipients are required to provide a brief final report and submit an approximately one-page summary of the project for publication in the AEESP Newsletter. Accompanying photos with captions are encouraged. Project summaries should be sent to the attention of Executive Administrator, Brian Schorr, at bschorr@aeesp.org.

Spotlight: Environmental Engineering Science, AEESP Journal

Dr. David A. Ladner, AEESP Publications Committee Chair, Clemson University

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 three times per year in the journal 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 a select article from the April through July 2023 issues of EES. Congratulations to those whose work is highlighted.

[Dana L. Armstrong, Sarah J. Fischer, Robert Lupitskyy, Birthe V. Kjellerup, Clifford P. Rice, Mark Ramirez, and Alba Torrents \(2023\)](#). Thermal Hydrolysis Pretreatment Effects on Endocrine Disrupting Compounds and Microbial Communities in Wastewater Sludge from Anaerobic Digestion. *Environmental Engineering Science*, 40(6), 219-232.

Many readers of this Spotlight will recognize a conventional train of processes for wastewater treatment: primary sedimentation, activated sludge including secondary sedimentation, filtration, and disinfection. Settled solids are often sent to an anaerobic digester (AD) for stabilization and volume reduction, along with biogas production. A goal of many recent research efforts is to improve the AD process to generate the most biogas possible while minimizing the mass of sludge sent offsite. A thermal hydrolysis process (THP) is one promising approach to achieve those goals.

Armstrong et al. (2023) used sludge from a full-scale wastewater treatment plant to investigate whether the THP process had any effects on endocrine disrupting compounds (EDCs) in the sludge. EDCs are important because they are often found in wastewater and concerns about the health and environmental impacts of these compounds have gained the attention of regulatory agencies in many countries. One idea is that the THP process may cause greater destruction of EDCs, since they are exposed to higher temperatures and pressures. But another possibility is that greater release of EDCs may be caused as they are liberated from their adsorbed state during thermal hydrolysis. Armstrong et al. (2023) found that some EDC concentrations increased, while others decreased, which points to a mechanistically complex set of interactions in the overall THP-AD treatment train. In an attempt to shed light on the microbial contribution to those mechanisms, bioinformatics was used to evaluate the anaerobic microbiome community structure in the various samples. While THP clearly affected the abundance of microbes in its effluent, there was no clearly discernible effect on the community structure in the downstream AD step. This suggests that the behavior of EDC removal or release was tied to other (perhaps physicochemical) mechanisms. Readers are encouraged to learn more by downloading the article from the June 2023 issue of EES.

Overall, this study serves as an example of the way chemical analysis and microbial analysis can be coupled to better understand chemical fate and transport in engineered treatment systems. This is especially important for new processes where the behavior has not been previously explored and is difficult to predict.

Dr. Yang Deng Honored with WEF 2023 Camp Applied Research Award



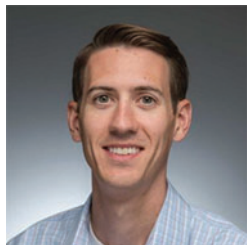
Dr. Yang Deng, the University Distinguished Professor at Montclair State University, has been named the 2023 recipient of Camp Applied Research Award by the Water Environment Federation (WEF). This prestigious award is presented to a WEF member who demonstrates a unique application of basic research or fundamental principles through the design or development of a wastewater collection or treatment system.

Dr. Deng's recognition stems from his creative contribution to physicochemical treatment technologies and inventive engineering design strategies, which enables innovative engineering solutions in the areas spanning from drinking water treatment, wastewater reclamation, to stormwater management and harvesting.

AEESP Distinguished Lecturer Series Tour, 2022-2023

Submitted by Drs. Cliff I. Davidson (Syracuse University; Tour Summary) and Kyle Doudrick (University of Notre Dame; Introduction)

Introduction (Kyle Doudrick)



The AEESP Distinguished Lecture Series is an annual event that was initiated in 1969. The featured lecturer for 2022-2023 was Prof. Cliff Davidson from Syracuse University. His tour commenced in September 2022 and concluded in April 2023, during which he visited 18 host schools.

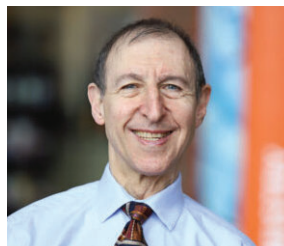
During his visit to Notre Dame, I had the opportunity to learn more about his experiences during the tour. It occurred to me that it would be a nice idea to have him share his insights with all AEESP members. I interviewed Cliff after his tour was over. Here's a summary of our conversation:

Cliff embarked on his tour with an open mind and a goal to not only deliver his lectures but also to immerse himself in the unique atmosphere of each host school and gain an understanding of their faculty's work. He diligently took notes to reflect on each visit, and he has graciously provided us with a summary of some of these experiences below. Each week, Cliff would teach on Mondays and Wednesdays in Syracuse and then travel to the next school on Wednesday evening. He initially had concerns about exhaustion, but as time went on, he became increasingly enthusiastic about each stop on the tour. Cliff expressed his amazement at how much he had learned – not just about the universities, but also about the faculty, students, and notably, about himself. One of the most profound insights he had was about AEESP and its members. He was deeply impressed by his colleagues involved with the organization and the warm and welcoming atmosphere of everyone, particularly noting that it's a great organization to devote your time to.

Cliff's next endeavor is to transition to the status of Emeritus, a decision that the tour has helped reinforce. He plans to continue conducting research with graduate students and has an extensive writing agenda on his to-do list.

For the next AEESP Distinguished Lecturers, Cliff offers valuable advice: relish the time spend with the people you meet at each location and make room for personal interactions, whether it involves going for a run, visiting someone's home, or sharing a coffee.

Summary of AEESP Distinguished Lecture Tour (Cliff Davidson)



Note that this is not a complete list of either schools visited nor researchers I met. That would necessitate a much greater effort than this brief write-up. I visited a few schools which were not part of the AEESP Lecture Series because I had friends and col-

laborators at these other schools. Only included here are the 18 colleges and universities on the official lecture tour. I also did not include everyone I met on the tour – this summary focuses on faculty only, although I met with postdocs, graduate students, research staff, and sometimes undergraduate researchers at each of these 18 schools. I also included only those faculty with whom I spent significant time, and those with interests that piqued my own curiosity, as well as faculty whom I already knew or was familiar with through the literature. Altogether, less than half the faculty I met on the tour are included here.

Sep 22-23: The first school visited on the tour was **Washington University in St. Louis**, with its 169-acre campus and elegant architecture. My host was Dan Giammar who was an undergraduate at Carnegie Mellon. He studies groundwater remediation, carbon sequestration, chemical reactions to remove heavy metals from drinking water, and related topics. Dan is in the Energy, Environmental, and Chemical Engineering Department, where research covers a broad range of topics in partnership with several other schools. For example, a team of faculty including Rajan Chakrabarty, Randall Martin, and Jay Turner among others from this department established collaborations on measurement and modeling of atmospheric aerosols with India Institute of Technology – Bombay, which brings together some of the foremost experts from both schools. I also had a chance to meet with faculty from Southern Illinois University at Edwardsville across the river from St. Louis where several educational innovations are developing.

Sep 29-30: Northeastern University in Boston was the next stop on the tour, where Amy Mueller of the Department of Civil and Environmental Engineering hosted my visit, jointly with faculty and students from University of Rhode Island and University of Connecticut. Amy studies ways to characterize the natural and built environments, and studies their responses to climate change. She also conducts research on affordable renewable energy systems. Her colleague Phil Larese-Casanova in the same department studies contaminant transformation processes such as redox, sorption, and disso-

lution. The department contains two major research centers, both related to health impacts of pollutants: the Puerto Rico Test site for Exploring Contaminant Threats, and the Center for Research on Early Childhood Exposure and Development which also focuses on Puerto Rico. Other research is related to the dense urban area where Northeastern is located, such as Matthew Eckleman's research on Sustainable Building Systems.

Note that Amy and Phil chaired the AEESP conference this past June, while Dan Giammar chaired the AEESP conference a year ago – congratulations to Amy, Phil, and Dan on two outstanding conferences!

Oct 13-14: Drexel prides itself on having a particularly broad ranging Department of Civil, Environmental, and Architectural Engineering. The school is in the heart of downtown Philadelphia, and there is a strong research thrust at the intersection of urban water quality/quantity, urban infrastructure, and human health/productivity/comfort. My hosts were Chuck Haas and Patrick Gurian, both experts in microbial water quality. Simi Hoque is an architect with extensive experience in modeling building energy efficiency and sustainable design. Patrick Gurian and Simi Hoque were graduate students at Carnegie Mellon years ago. Drexel is also a major player in the climate change arena, with Franco Montalto managing the northeast hub of the Urban Climate Change Research Network.

Oct 20-21: The University of Illinois at Urbana-Champaign has a large and diverse Department of Civil and Environmental Engineering, where my host was Vishal Verma. Vishal's group is studying inhaled and exhaled fractions of PM2.5 with and without face masks, and also water infiltration rates through soil planted with various types of vegetation. Jeremy Guest and his students are using "Quantitative Sustainable Design" to develop affordable innovative technologies for sewage treatment and for sustainable agriculture for widely varying environments. Lei Zhao and his students are using satellite data to examine urban heat islands; recent work also includes risks of heat exposure in cities with changes in humidity, and future expectations of heat stress in cities that continue to grow as the climate changes. Related to this work, Nicole Riemer studies the impacts of aerosols on atmospheric heat flows and humidity, and their impact on climate change. She is also examining optical properties of aerosols as a function of their internal versus external mixing.



Figure 1: Some of the graduate students at University of Illinois at Urbana-Champaign October 21, 2022

Oct 27-28: The University of Texas at El Paso is a unique institution, located in the world's largest pair of sister cities across an international border. Roughly 13% of UTEP's students commute daily from Ciudad Juarez. Both research and education are oriented around US-Mexico relationships and shared resources in this water-stressed region. My host was Alex Mayer from the Department of Civil Engineering, whose research spans a broad range of topics. Examples include hydrologic impact of cultivation of various plants for bioenergy production, perceived health risks associated with drinking water in rural communities of northwest Mexico, modeling of pathogens in river systems in Mexico, seasonal variations in phosphorus loadings in these rivers, and water resource optimization models. Research on a desert-oriented green roof was explained by Kevin Floyd, Botanical Curator of the Centennial Museum and Chihuahuan Desert Gardens.

A group of seven graduate students from the University of New Mexico drove from Albuquerque down to El Paso and shared information on their research as well; I visited these students in Albuquerque as well as faculty at UNM a few months later.

Nov 3: My host at the University of Pittsburgh was Meng Wang from Civil and Environmental Engineering. Meng explores ways of using engineered micro-organisms for a variety of purposes, such as biodegrading toxic chemicals, purifying water, and recovering metals from waste products. Vikas Khanna assesses the sustainability of natural and engineered systems; examples of his projects include developing models of food-energy-water systems, quantifying environmental impacts of biofuels, and quantifying ecosystem services. Melissa Bilec has developed expertise in environmental impacts of the built environment. Examples of her projects include conducting life cycle assessment of building components, modeling indoor pollutants, and developing tools for predicting energy use in buildings, among other topics. Sarah Haig is working on ways of reducing exposure to microbes in drinking water, e.g., microbes released during showering, and examining the indoor transport of aerosols containing viruses, including Covid 19. CEE department chair is Radisav Vidic, with expertise in water treatment and re-use, e.g., impacts of hydraulic fracturing on water resources and many other water contamination issues.

Nov 4: Visiting Carnegie Mellon was essentially coming back to my home institution where I had spent more than 30 years. My host was Kelvin Gregory in Civil and Environmental Engineering (CEE), who works with microbiology in several applications. For example, he is currently developing new methods for remediation of contaminated sediments and is exploring the biogeochemistry of sequestering CO2. Burcu Akinci is CEE department head, and she works with Building Information Models using embedded sensors and 3-D imaging as well as creating digital twins for building and infrastructure operations. Peter Adams is Department Head

in Engineering and Public Policy (EPP) and also a member of CEE. He has expertise in atmospheric aerosols and has studied fundamental processes affecting condensation nuclei, ultrafine particles, and links between climate change and air quality, including use of chemical transport models to establish regulations based on health effects of these particles. Greg Lowry in CEE has expertise in physical and chemical processes associated with movement of contaminants in environmental systems, and in applying these fundamentals to remediation and fate of toxic substances in the environment. Pingbo Tang in CEE conducts research on improved management of constructed facilities, using models of human-cyber-physical infrastructure systems for operations at airports, wastewater treatment plants, energy production plants, and more.

Nov 17-18: My host at **Georgia Tech** was Ted Russell, who was on the faculty at Carnegie Mellon years ago, and who has studied the fundamental physics and chemistry of airborne particulate matter as well as gaseous pollutants. He has investigated questions such as how secondary organic aerosol is formed and the influence of atmospheric particles on light extinction, among many other topics. Rodney Weber is also focused on fundamental atmospheric physics and chemistry, looking at a wide range of topics such as nucleation of particles, identifying sources of atmospheric contaminants, and their ultimate fate. I have collaborated for many years with John Crittenden and Mike Chang, both at Georgia Tech. John has worked in several broad areas of the environment, including innovative methods of water treatment, air treatment, and urban sustainability, including collaboration with Mike Chang on many of these topics. Sally Nga is the Principal Investigator of the NSF Atmospheric Sciences and Measurement Network (ASCENT) which is establishing 12 sites for air pollutant monitoring in urban as well as remote areas across the country.

Dec 7-8: The **University of Toronto** is the largest university I visited on the tour, with 65,000 students (2/3 undergraduate) on the main "St. George" campus in downtown Toronto. My host was Elodie Passeporte, who uses stable isotopes to study the effectiveness of remediation methods for contaminated surface waters and groundwater. Elodie is in two departments, namely Civil and Mineral Engineering (CivMin), and Chemical Engineering and Applied Chemistry (ChemE). I met with the Chairs of both of these departments: Brent Sleep (CivMin) studies environmental fate and transport of organic contaminants, and develops in-situ remediation methods for contaminated soil and groundwater, while Ramin Farnood (ChemE) studies wastewater treatment and resource recovery using membrane separation, ultraviolet treatment, and oxidation processes. Greg Evans (ChemE) studies urban air quality, identification of pollution sources, exposures of residents to air pollutants, and pollutant effects on human health. Sean Thomas is a plant ecologist in Architecture, Landscape, and Design who studies human impacts

on forests around the world, and also conducts research on green roofs. Two prior graduate students at Carnegie Mellon are now on the faculty at the University of Toronto: Heather MacLean studies environmental impacts of energy systems, and Daniel Posen conducts system-scale environmental analysis to inform public policy and decision makers. In addition, former Dean of Engineering and Applied Science at the University of Toronto, Cristina Amon, was on the faculty at Carnegie Mellon years ago.

Jan 19: My visit to the **University of Colorado at Boulder** (CU-B) was hosted by Marina Vance, who is investigating indoor aerosols from various sources. A particular focus is consumer products emitting nanoparticles that can be subsequently inhaled with potential health impacts. Jana Milford was one of my MS students at Carnegie Mellon, and she continued graduate work for her PhD and then years later graduated from CU-B Law School. She conducts research on a wide variety of topics, for example, air quality impacts of changes in U.S. energy production, modeling of air pollutant transport and fate, and impacts of climate change on public lands. Joe Ryan has worked on numerous projects on contaminants in surface water and groundwater, for example those associated with fossil fuel production and mining. Shelley Miller works with urban air quality, indoor air quality, and most recently control of bioaerosol movement around buildings to reduce spread of infections. Angela Bielefeldt conducts research on environmental engineering education, identifying student attitudes toward social responsibility, engineering ethics, service learning, engagement with the community, and related topics. Karl Linden works widely in water and wastewater treatment and re-use, for example using ultraviolet disinfection. He served as President of the AEESP during 2019-2020.

Jan 26: My hosts at **University of Maryland - College Park** were two faculty members in Civil and Environmental Engineering: (1) Allen Davis, who had just published his textbook *Green Stormwater Infrastructure* (Allen Davis, William Hunt, and Robert Traver) and (2) Guangbin Li who joined the UMD faculty a few years ago. Allen is well-known for his research on bioretention of urban runoff and methods of reducing contaminants in the stormwater. Guangbin studies biochemical processes at the food-energy-water nexus, for example, factors influencing anaerobic ammonia oxidation for wastewater treatment. Alba Torrents has studied organic chemicals, including several emerging pollutants, in water and wastewater systems, especially those used in agriculture. She also studies sustainable practices in history, such as efforts toward sustainable water use and sustainable land use practiced by the Inca civilization in Peru. Natasha Andrade, who received her PhD in the UMD CEE Department and later joined the faculty, has studied PCBs and pesticide residues in water systems, and also conducts research on environmental engineering education. Birthe Kjellerup, with expertise on biofilms, studies innovative ways to clean up contaminated water at military sites, especially for persistent organic pollutants and metals.

The AEESP event was planned jointly with the University of Maryland – Baltimore County (UMBC), and I was able to meet with two UMBC visitors. Upal Ghosh, who was a graduate student at Carnegie Mellon, is on the faculty at the Department of Chemical, Biochemical, and Environmental Engineering. He is studying various organic contaminants and metals in soil and sediments, for example PAH in soils, and PAH and PCBs in marine sediments. Lee Blaney from the same department studies contaminants from sewer systems and septic systems in Chesapeake Bay and in urban and rural streams. He also researches emerging contaminants such as pesticides, pharmaceuticals, and personal care products in the environment, and studies processes by which these compounds degrade.

Feb 3: The **University of Nebraska - Lincoln (UNL)** specializes in environmental impacts of farming, consistent with the state's largest industries of corn, wheat, soybean, beef, and poultry production. My host at UNL was Bruce Dvorak of the Civil and Environmental Engineering Department. A group from Iowa State University traveled to UNL for the AEESP event, and an additional partner was University of Nebraska – Omaha. Bruce conducts research on a range of topics, for example, water and wastewater treatment for organic contaminants, sources of microbial contaminants in urban streams, and life cycle assessment of offshore wind generators, corn and beef production, and wastewater treatment. Shannon Bartelt-Hunt is chair of the CEE department, and she studies the ultimate fate and impacts of a variety of contaminants in the agricultural environment. Some examples include pharmaceuticals and illicit drugs in wastewater and surface waters, infectious prions in contaminated soil, and human exposure to hormones used in beef and dairy cattle. Nirupam Aich in the CEE Department is studying physico-chemical treatment of water and wastewater, such as the use of nanomaterials and 3D printing for remediation of water contaminated with PFAS, and inequities in the exposure to contaminants. Nick Brozovic is Director of the Daugherty Water for Food Global Institute at UNL. The Institute is bringing together research on food production and use/re-use of water to work toward ways to produce sufficient food for the world while using scarce water resources sustainably.

Feb 9-10: The **University of Central Florida (UCF)** in Orlando was founded sixty years ago to advance exploration of space and enable human spaceflight, and the school has excelled in those topics since its beginning. As such, the university has taken advantage of research in technologies used in space travel that can promote our interaction with the environment, such as improving re-use of wastewater and promoting energy efficiency. The AEESP event at UCF was planned in partnership with University of Southern Florida in Tampa, University of Florida in Gainesville, and Florida Atlantic University in Boca Raton. My host at UCF was Steve Durancieu in the Civil and Environmental Engineering Department, with expertise in production of drinking water and re-use of wastewater, e.g., by reverse osmosis which is used by many

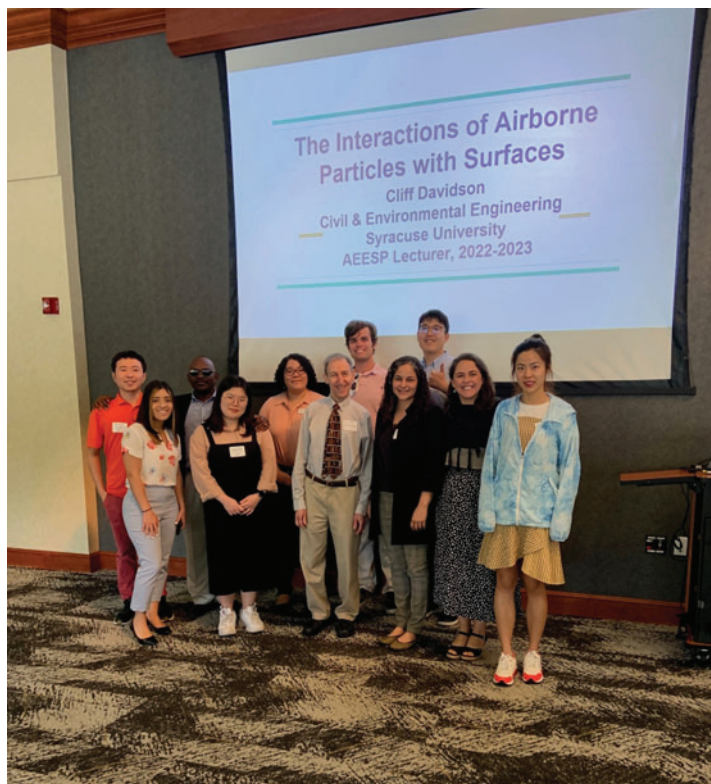


Figure 2: Faculty and graduate students from University of Florida - Gainesville (UFL) visiting AEESP event hosted by University of Central Florida - Orlando, February 10, 2023 (Photo by Prof. Katherine Deliz of UFL)

plants throughout Florida and around the country. I also met with Jiannen (Nick) Chen in the same department who specializes in research on minimizing contaminant transport from waste sites using various materials in liners.

The group from USF Civil and Environmental Engineering included Jim Mihelcic, once a graduate student at Carnegie Mellon, with expertise in the impacts of civilization on water resources, especially in developing countries, as well as sustainable human development and engineering education. The USF group also included Qiong (Judy) Zhang whom I have worked with to present AEESP workshops and who has expertise in environmental transport and fate of contaminants and sustainability/life cycle assessment, and Katherine Alfredo who is known for her work on estimating reductions in health risks associated with stricter water contaminant regulations.

The group from UFL included Jean-Claude Bonzongo from the Department of Environmental Engineering Sciences, and Katherine Deliz from the same department. Jean-Claude is a biogeochemist who studies a range of contaminants in water systems, especially metals, emerging contaminants, and nanomaterials and their ecosystem and human health effects. Katherine is also a biogeochemist conducting community-engaged research on how pollutants and pathogens impact ecosystems and human health.

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Figure 3: Faculty and graduate students from University of South Florida - Tampa (USF) visiting AEESP event hosted by University of Central Florida - Orlando, February 10, 2023
(Photo by Ph.D. student Chris Nenninger of USF)

Feb 16: The economy of Iowa is dominated by corn, soybeans, and hog production among other farming activities, and the **University of Iowa** has put a major emphasis on environmental impacts of agriculture. My host at the University of Iowa was Keri Hornbuckle, who conducts field studies of PCBs in indoor and outdoor air, natural water systems, river sediments and other environmental media, and develops models to predict the transport and fate of PCBs. Charlie Stanier, a former graduate student from Carnegie Mellon, is involved in research on atmospheric nitrogen and volatile organic compounds leading to the formation of ozone, among other ambient trace gas and particle studies. Greg Lefevre studies contaminants in urban stormwater runoff, including pesticides, pharmaceuticals, petroleum hydrocarbons, and other chemicals, and investigates the use of phytoremediation for treatment. He is also studying the implications of continued groundwater withdrawal without replacement which leads to groundwater depression. I also met with Jerry Schnoor, who has broad expertise in the chemistry and treatment in natural water and wastewater, and more recently research in climate change and sustainability. Jerry is widely known as Editor-in-Chief of *Environmental Science and Technology* during 2002-2014.

Feb 23-24: I was supposed to visit both University of Michigan and **Michigan State University**, but an ice storm made it impossible to reach Ann Arbor. My hosts at Michigan State were Susan Masten and Syed Hashsham, both in Civil and Environmental Engineering. Susan studies remediation of soil and wastewater contaminated with organic chemicals

such as pesticides and PAHs. She also investigates the toxicity of byproducts of the oxidation process, among other topics. Syed studies the functioning of microbial communities, and he develops tools for microbial testing, including assessment of resistance to antibiotics. Kaisen Lin in the same department studies how bioaerosol particles deposit in the human respiratory system and investigates the damage they can cause. Kirsten Cetin conducts field research in Alaska related to shortages of housing in small villages, where she examines tradeoffs between tight energy-conserving houses and high concentrations of indoor pollutants. Allison Cupples studies biodegradation of chemical contaminants like BTEX and chlorinated solvents as well as emerging contaminants, e.g., antimicrobials and pharmaceuticals, in agricultural soils. I also met with Joan Rose from the Biosystems and Agricultural Engineering Department, who has worked on a number of research topics related to reducing human health risks of contaminants in public water supplies. She is well-known for her work in sequencing virus DNA in water.

Mar 23-24: My visit to the **University of Arizona** (UA) in Tucson was arranged as a 3-school event with Arizona State University in Tempe and Northern Arizona University in Flagstaff. My host at the University of Arizona was Andrea Achilli in the Department of Chemical and Environmental Engineering, who studies water and wastewater treatment using membranes, e.g., desalination by reverse osmosis, among other topics. Kerri Hickenbottom in the same department also works with membrane systems and conducts life cycle assessments on their use in water purification. Both Andrea and Kerri are

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working on the nexus of food-energy-water systems, and they have partnered with Pima County Regional Wastewater Reclamation Department, Tucson Water, and other agencies to study improvements in water use and re-use. Vicky Karanikola in the same department is working with the Navajo Nation to improve water use and re-use on Navajo land that account for cultural traditions, and is also studying fundamental processes for removing PFAS from drinking water. Kim Ogden is chair of the department. After a long history of research projects on biomass, biofuels, and bioproducts, Kim is probably best known for her current project funded by the US Department of Agriculture and Bridgestone Tires on the use of the desert shrub *guayule* to produce rubber.

Laura Condon moved from the CEE department at Syracuse University to the University of Arizona Department of Hydrology and Atmospheric Sciences a few years ago. She studies the impacts of managing groundwater on soil moisture, energy fluxes to the atmosphere, and weather patterns using system dynamics modeling. I also met virtually with Terry Baxter in Civil and Environmental Engineering at Northern Arizona University who studies health effects of inhaling woodsmoke and e-cigarettes, among other topics.

I was able to get a ride from Tucson to Phoenix kindly provided by Matt Frazer from the School of Sustainable Engineering and the Built Environment at Arizona State University. Matt researchers a range of air quality issues, from sources and transport to pollution control and monitoring instrumentation.

Mar 30-31: The **University of Notre Dame** is a Catholic school with a large campus (~1,265 acres) in South Bend, Indiana. The AEESP event was organized in partnership with Illinois Institute of Technology – Chicago, Northwestern University, Bradley University, and Purdue University. My host was Robert Nerenberg of the Department of Civil and Environmental Engineering and Earth Sciences, who studies the formation of biofilms and the performance of membrane-based biofilm reactors for water treatment. Diogo Bolster is chair of the department, with expertise in different types of fluid flow, e.g., groundwater flow through porous soil, river and stream flows, air flow over cities, and complete versus incomplete mixing in flows. Melissa Berke in the same department studies sediment cores from lakes and streams, and provides information about ecosystems from years past. Alan Hamlet in the department works on hydrologic as well as atmospheric flow modeling, for example, he is studying the impact of green roofs on the urban heat island in Chicago. Kyle Doudrick in the department monitors PFAS and other emerging contaminants in drinking water, natural surface waters, and ocean water, and is developing ocean water, and is developing treatment technologies for reducing PFAS levels where people can be exposed.

For the visiting schools, George Zhou from Purdue (Civil Eng. and Environmental and Ecological Eng.) has studied antibiotics and antibiotic resistance in surface waters, livestock waste, and other media, and he is currently exploring methods of removing PFAS and other emerging contaminants from water systems. Caitlin Procter of Purdue (Agricultural and Biological Eng. and Environmental and Ecological Eng.) is exploring buildup of contaminants in stagnant water when buildings are closed to entry for a period of time, e.g., to minimize spread of Covid. By allowing water to stagnate, antibacterial chemicals in the water can decay, and copper and lead can leach into the water from pipe walls, leading to unsafe drinking water.

Brent Stephens is Chair of the Civil, Architectural, and Environmental Engineering Department at IIT, and he researches pollutants in the indoor environment. Examples include infiltration of gases and particles from outdoors to indoors, impacts of HVAC filter systems, the role of human activities indoors, and the spread of Covid aerosol through a cruise ship during an onboard outbreak of the disease. David Lampert of the same department is researching ways of reducing energy use for treating water and wastewater, and is currently working on ways to minimize the movement of PFAS chemicals from soil and groundwater to surface waters and sediments.

Apr 13-14: The last institution I visited on the tour was **New Jersey Institute of Technology**, where the AEESP event was a partnership of NJIT with 8 other schools: Columbia University, Manhattan College, Montclair State University, New York University, Princeton University, Rutgers University, SUNY Stonybrook, and SUNY Albany. My host was Wen Zhang of the Civil and Environmental Engineering Department, and I was also assisted by my former MS student Xiao Yang who is VP of the Brisea Group in Parsippany, NJ. Wen researches a range of technologies, such as developing treatment methods for emerging contaminants in water and wastewater, novel methods of irrigating agricultural crops using nanobubbles and hydrogen gels, and recycling lithium ion batteries. Mengyan (Ian) Li from the Department of Chemistry and Environmental Science at NJIT uses molecular technologies such as cloning and microarrays to treat contaminated water, and develops controls for corrosion caused by microbes. He also uses microbial enzymes for producing biofuels.

Catherine Peters, who received her graduate degrees at Carnegie Mellon, is Chair of the Civil and Environmental Department at Princeton. She conducts research on the environmental effects of underground activities associated with producing energy, such as hydraulic fracturing, geothermal energy, and sequestration of carbon dioxide from fossil fuel combustion. Andre Butler, a former graduate student at Carnegie Mellon, is in the Civil and Urban Engineering Department at NYU. His research is on developing inexpensive monitoring equipment for particles and understanding changes in ozone and particle concentrations over time and space. Andrea Silverman in

the same department at NYU studies green infrastructure for treating wastewater, such as constructed wetlands and treatment ponds. She also uses wastewater data for epidemiology studies, and she works with government officials and community groups to monitor local flooding in New York City in real time.

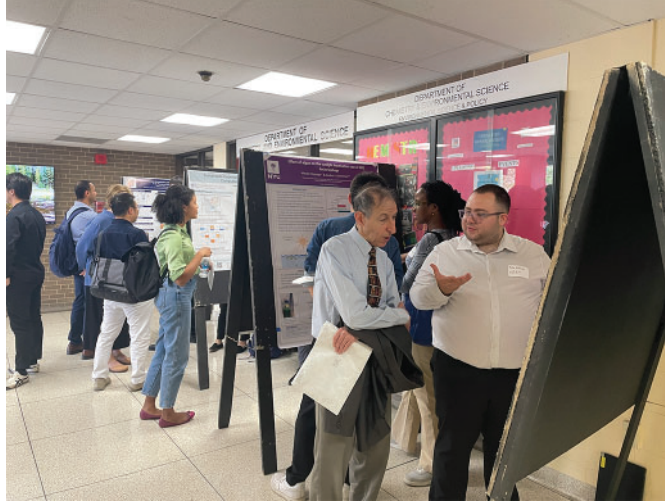


Figure 4: Poster session at AEESP event hosted by New Jersey Institute of Technology - Newark April 14, 2023



*Figure 5: Dinner at a local restaurant in Newark, part of the AEESP event hosted by New Jersey Institute of Technology. Participants from 8 other universities participated in the event. April 14, 2023
Photo by Cliff Davidson*

Duke University Department of Civil and Environmental Engineering (CEE) Welcomes New Faculty

Six faculty working in areas of Sustainable Materials, Environmental Biotechnology, and Climate Resilience are joining a vibrant and growing academic community in the Department of Civil and Environmental Engineering at the Pratt School of Engineering at Duke University. Their hiring aligns with Duke's ongoing Science and Technology Initiative, the Duke Climate Commitment announced last year, and the Department's new PreMiEr NSF ERC on environmental biotechnology.



Dr. Leanne Gilbertson joined Duke CEE in July 2023 as an Associate Professor as a member of the department's Environmental Health Engineering area, conducting research in **sustainable materials**. Research in her group aims to inform sustainable design of emerging materials and technologies proposed for use in areas at the nexus of the environment and public health. Dr.

Gilbertson's research has been recognized and is supported by the National Science Foundation, including the CAREER award, 3M non-tenured faculty award, and the Ralph E. Powe Junior Faculty Enhancement Award. She was also a Gordon and Betty Moore Inventor Fellow finalist. Prior to joining Duke, Dr. Gilbertson was an Associate Professor and the Fulton C. Noss Faculty Fellow in the CEE Department at the University of Pittsburgh since 2015. She completed a postdoc in the Center for Green Chemistry and Green Engineering at Yale University and received her M.S. and Ph.D. degrees from Yale University in the Department of Chemical and Environmental Engineering, supported by the NSF Graduate Research and EPA STAR Fellowships. Her research focused on bridging length scales – from the molecular to systems-level – to build sustainable design guidelines for engineered nanomaterials. Dr. Gilbertson received her bachelor's degree in chemistry with a minor in education from Hamilton College, after which she spent several years as a secondary school teacher before returning to graduate school.



Dr. Jeseth Delgado Vela joined Duke CEE in August 2023 as a member of the department's Environmental Health Engineering area, conducting research in **environmental biotechnology**. Her work focuses on leveraging environmental biotechnology to improve urban water infrastructure. She integrates molecular tools and modeling to understand how microbial community

interactions and dynamics affect engineered water treatment systems. Dr. Delgado Vela earned a Ph.D. and M.S. in Environmental Engineering and M.S. at the University of Michigan, and a B.S. in Civil Engineering from the University of Texas at Austin. Prior to joining Duke, she was an Assistant Professor in the Department of Civil and Environmental Engineering at Howard University. She was a recipient of the Ford Foundation Dissertation Award (2016), was named an Early Career Research Fellow by the Gulf Research Program (2022) and was awarded an NSF CAREER Award (2022).



Dr. Nicole Rockey joined Duke CEE as an Assistant Professor in August 2023 as a member of the department's Environmental Health Engineering area, conducting research in **environmental biotechnology**. Her work aims to reduce infectious disease burden by better understanding the persistence of viral pathogens in the built environment. She uses both

laboratory and modeling approaches to establish transmission risks and identify engineering interventions that will aid in developing robust, sustainable responses to microbial threats. Dr. Rockey received a B.S. in Civil Engineering from the University of Texas at Austin, and a M.S. and Ph.D. in Environmental Engineering from the University of Michigan in Ann Arbor. Prior to joining the Department, Dr. Rockey was a postdoctoral researcher at the University of Pittsburgh Medical Center in the Department of Microbiology and Molecular Genetics.



Dr. Laura E. Dalton joined Duke CEE as an Assistant Professor in August 2022 as a member of the department's Geomechanics and Geophysics area, conducting research in **climate resilience**. The overall goal of her research group is to study chemical and physical processes that occur during the reactive transport of CO₂ in both

engineered (cementitious) and natural (geological) porous materials working towards permanent solutions to sequester CO₂. Dr. Dalton earned a Ph.D. in Civil Engineering from North Carolina State University and holds a M.S. and B.S. in Civil Engineering from West Virginia University as well as a B.A. in Graphic Design. Prior to joining Duke, she was a Ph.D. candidate at North Carolina State University and part-time research scientist for Batelle (contractor supporting the U.S. Department of Energy's National Energy Technology Labo-

ratory located in Morgantown, WV) where she conducted research supporting Carbon Capture and Storage in saline aquifers. During her Ph.D., she was awarded a Fulbright Fellowship and spent nine months conducting research at the University of Eastern Finland in Kuopio, Finland (2021).



Dr. Sarah Oliver, PE, PMP, LEED AP joined Duke CEE in July 2023 as an Executive in Residence and the inaugural **Director of the Master of Engineering in Climate and Sustainability** program. Focused on **climate resilience**, this program will train engineers to develop and apply sustainable solutions to complex climate challenges impacting diverse populations across the

globe. Ms. Oliver comes from over 15 years working as a Professional Engineer and Program Manager experienced in climate resilience, transportation and urban planning, community engagement, highway design, environmental compliance, and governmental contract compliance. She served as Project Manager for the World Trade Center Flood Resilience Program – a full lifecycle project including hydraulic modeling and analyses, mitigation alternative analysis, preliminary and final design, full scale testing, stakeholder coordination, and construction support services. Most recently, she served as the Deputy Program Director of the FEMA Community Engagement and Risk Communications contract

where she led a team of over 150 experts (in areas ranging from engineering to behavioral science) who work with communities across the country to help them understand their risk to natural disasters and empower them to take action to protect themselves. Ms. Oliver received her BSE in Civil and Environmental Engineering from Duke University, received her MUP from NYU Wagner School of Public Services, is a registered Professional Engineer in NY State, is a registered Project Management Professional, and is a LEED AP.



Dr. Marta Zaniolo joins Duke CEE in January 2024 as a member of the department's Hydrology and Fluid Dynamics area, conducting research in **climate resilience**. Her research addresses timely water sustainability challenges including how to ensure reliable and equitable access to water resources

in the face of scarcity, competing demands, and a changing climate. She combines the fields of hydrology and water resources modeling with machine learning and data mining techniques to enable more informed decision-making about water use at scales large and small. Dr. Zaniolo holds a BS and MS degree in Environmental Engineering and a PhD in Information Technology earned in the Environmental Intelligence lab at Politecnico di Milano. Prior to joining Duke, she was a postdoctoral researcher in the CEE department at Stanford University.

Dr. Minjae Kim joins the University of Kentucky



Dr. Minjae Kim joined the Department of Civil Engineering at the University of Kentucky as an Assistant Professor in August 2023. He previously completed a Ph.D. in Environmental Engineering from the Georgia Institute of Technology while working with Dr. Kostas T. Konstantinidis. His overarching research goal is to pioneer innovative biotechnological solutions

that enhance both environmental and human health. His research methodology adopts a multidisciplinary approach, leveraging advanced bioinformatics. He earned an M.S. in Environmental Science and Engineering from the Pohang University of Science and Technology and a B.S. in Chemical and Biomolecular Engineering from Sogang University. At the University of Kentucky, Dr. Kim has joined the new departmental area of Environmental Microbiology in efforts to pursue research and teaching that focus on applying microbiology, bioinformatics, engineering, and public health to create meaningful impacts for people and the environment.

Dr. Xavier Fonoll Almansa joins the University of Texas at Austin



Dr. Xavier Fonoll Almansa will Join the Civil, Architectural and Environmental Engineering Department at the University of Texas at Austin as an Assistant Professor in Spring 2024. His research group will focus on the development of sustainable biological and chemical processes that can recover valuable resources from wastes. One of the challenges these processes

will tackle will be the lack of proper sanitation in developing countries and remote areas. Before joining UT Austin, Dr. Fonoll Almansa was a Research Manager at the Great Lakes Water Authority and a Lecturer at Universitat Carlemany. He received from the University of Barcelona his B.S. in Chemical Engineering, his M.S in Environmental Engineering and his Ph.D Engineering and Advanced Technologies. He was also a postdoc at the University of Michigan for four years after receiving his Ph.D.

Michigan Tech's Department of Civil, Environmental, and Geospatial Engineering (CEGE) welcomes two new faculty



Dr. Jiehong Guo joined Michigan Tech's Department of Civil, Environmental, and Geospatial Engineering as an Assistant Professor in spring 2023. She is an environmental analytical engineer. Her research interests include the use of mass spectrometric approaches for identifying biomarkers of DNA damage caused by carcinogens and the development of analytical methods

for measuring persistent, bioaccumulative and toxic pollutants in various environmental matrices. Dr. Guo earned a B.S. degree in Bioengineering from Chang'an University in Xi'an, China and a M.S. degree in Environmental Engineering from Beijing Technology and Business University in Beijing, China. She earned a Ph.D. degree in public health at the University of Illinois at Chicago. Prior to joining the Michigan Tech faculty, Dr. Guo conducted postdoctoral research at the School of Public and Environmental Affairs at Indiana University-Bloomington and was a senior researcher at the Masonic Cancer Center, University of Minnesota Twin Cities.



Dr. Ishi Keenum joined Michigan Tech's Department of Civil, Environmental, and Geospatial Engineering as an Assistant Professor in fall 2023. Dr. Keenum's research focuses on the microbiology of water systems. In particular, she is interested in the dissemination and treatment of antibiotic resistance in engineered and agricultural environments, establishing standards for microbiome research, pathogen

detection and control, and microbial ecology and molecular epidemiology. Dr. Keenum earned B.S. and M.S. degrees in environmental engineering from the University of Michigan and Virginia Tech, respectively. She earned a Ph.D. degree in civil engineering from Virginia Tech. Prior to joining the Michigan Tech faculty, Dr. Keenum completed postdoctoral research at the National Institute of Standards and Technology (NIST). She currently serves as the lead of the bioinformatic working group for the International Microbiome and Multi'omics Standards Alliance (IMMSA).

Dr. Joshua Bregy Joins the Faculty at Clemson University



Dr. Joshua Bregy joined the Department of Environmental Engineering and Earth Sciences at Clemson University as an Assistant Professor in January 2023. His research interests take an interdisciplinary approach to reconstruct and understand changes in climate, hazards, and extreme events during the Quaternary and Common Era

(though he is more than happy to go back further in time). While he uses many different paleoclimate proxies, he primarily relies on sedimentological, dendrochronological, and isotopic techniques for climate reconstructions. His research on paleohurricanes is largely focused on understanding changes in tropical cyclone frequency and intensity, long-term tropical cyclone-climate interactions, different tropical cyclone hazards (i.e., storm surge and precipitation), and developing novel proxy techniques for paleotempestology. This information can be used to prepare for ongoing and future changes in tropical cyclones in response to anthropogenic climate change. In addition to paleotempestology, he

works on reconstructing hydroclimates, atmospheric and oceanic circulation patterns, and other coastal/hydrologic hazards (i.e., tsunamis, floods, sea-level change). Dr. Bregy's appointment is part of an initiative by Clemson University's School of Civil and Environmental Engineering and Earth Sciences to address multifaceted aspects of climate change.

Washington University in St. Louis Welcomes Two New Faculty Members



Dr. Jenna Ditto joined the Department of Energy, Environmental, and Chemical Engineering at Washington University in St. Louis in January 2023. Her research focuses on the exchange of gas- and particle-phase organic compounds between indoor and outdoor air, with the goal of understanding the major emissions sources and chemical transforma-

tion pathways that impact human air pollution exposure and related health effects within the built environment. Prior to joining WashU, she was a postdoctoral fellow at the University of Toronto, where she worked jointly in the Chemical Engineering & Applied Chemistry Department and the Chemistry Department. She earned her Ph.D. from Yale University in Chemical and Environmental Engineering, and her B.S. in Chemical Engineering from Brown University.



Dr. Lu Xu joined the Department of Energy, Environmental, and Chemical Engineering at the Washington University in St. Louis in Fall 2023 as an Assistant Professor. Dr. Xu received his Ph.D. in Chemical Engineering from the Georgia Institute of Technology in 2016. He completed postdoctoral research at the California Institute of Technology and then worked as a research

scientist in the Chemical Science Laboratory for National Oceanic and Atmospheric Administration (NOAA). Dr. Xu's research interests are in air quality and climate change. He has investigated the atmospheric chemistry of organic compounds from diverse sources (wildfires, vegetation, power plants, etc.) and the subsequent impacts on air quality, human health, and climate. He also developed analytical methods based on mass spectrometry to characterize the complex atmospheric composition. His research involves laboratory studies, field measurements and instrument development.

Bucknell University Welcomes Dr. Austin Wadle



Bucknell University is pleased to welcome **Dr. Austin Wadle**, the Richard and Yvonne Smith Postdoc to Tenure Track Fellow in Environmental Engineering. Their research will focus on how bacteria, fungi, and humans can work together to address environmental engineering questions. They will use biominerals and feminist science studies as nuclei for the precipitation of novel

insights for remediation and queer liberation. Their scholarship functions on many different scales including freshwater wetland field sites, mesocosm wetlands, and bench scale experiments to build new environmental engineering insights. Further sites of interest include the intersection of gender and the environment in digital media and extracellular vesicle mediated biomineralization. Additionally, using critical feminist and queer perspectives, they hope to incorporate critical insights to ensure that the knowledge they produce works against colonialism and white supremacy.

Prior to beginning this fellowship, Dr. Wadle completed their doctoral dissertation titled "Microbe-mineral interactions: mercury homogenization, bacterial colloid surface acidity, and protocol transfeminism" at Duke University. They completed a Master's of Science en route to their PhD in Civil and Environmental Engineering. A highly interdisciplinary scholar, they also hold a Bachelors of Arts in Chemistry and Political Science from Grinnell College.

“The Executive Board of Directors would like to heartfully thank Dr. Belinda Sturm for the excellent presentation at this year’s WEFTEC Master Lecture: *Embracing the Imposter Among Us: How Interdisciplinary and Intersectional Identities are an Asset*. The Board would also like to thank Carollo for sponsoring the Meet and Greet event. Both events were a success due to the great attendance of our AEESP members. We are looking forward to seeing you all next year!”

**Debora Frigi Rodrigues, Ph.D.
AEESP President**

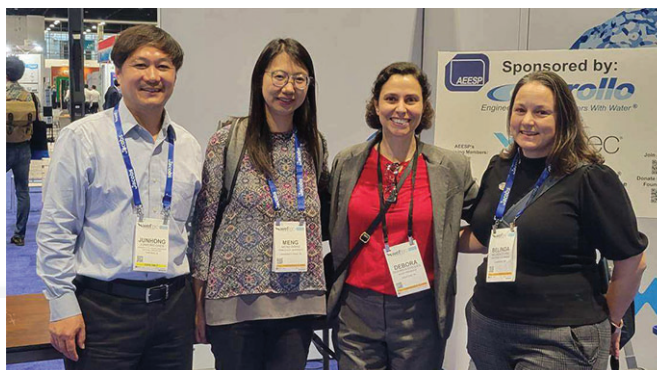
We are pleased to share the following photos taken from WEFTEC this year:



(Left to right): Eakalak Khan, University of Nevada, Las Vegas, Belinda Sturm, University of Kansas, Debora Frigi Rodrigues, University of Houston, Pusker Regmi, Brown and Caldwell



(Left to right): Lauren Stadler, Rice University, Debora Frigi Rodrigues, University of Houston, Maya Trotz, University of South Florida



(Left to right): Junhong Chen, University of Chicago, Meng Wang, University of Pittsburgh, Debora Frigi Rodrigues, University of Houston, Belinda Sturm, University of Kansas

Quantitative Environmental Risk Analysis for Human Health 2nd Edition

Robert A. Fjeld, Timothy A. DeVol and Nicole E. Martinez

John Wiley and Sons. ISBN: 978-1-119-67532-7

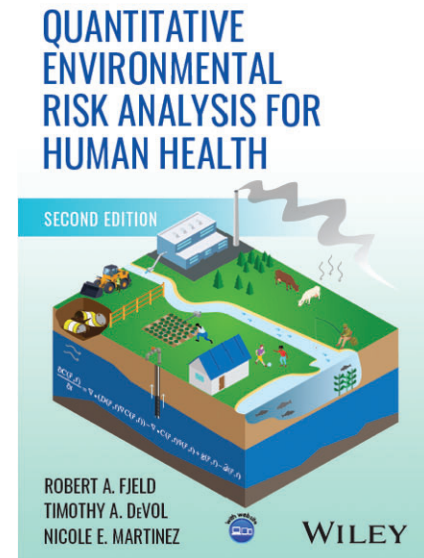
Environmental risk analysis is a systematic process essential for the evaluation, management, and communication of the human health risk posed by the release of contaminants to the environment. Performed correctly, risk analysis is an essential tool in the protection of the public from the health hazards posed by chemical and radioactive contaminants. Cultivating the quantitative skills required to perform risk analysis competently is a critical need.

Quantitative Environmental Risk Analysis for Human Health meets this need with a thorough, comprehensive coverage of the fundamental knowledge necessary to assess environmental impacts on human health. It introduces readers to a robust methodology for analyzing environmental risk, as well as to the fundamental principles of uncertainty analysis and the pertinent environmental regulations. Now updated to reflect the latest research and new cutting-edge methodologies, this is an essential contribution to the practice of environmental risk analysis.

Readers of the second edition of *Quantitative Environmental Risk Analysis for Human Health* will also find:

- Detailed treatment of source and release characterization, contaminant migration, exposure assessment, and more
- New coverage of computer-based analytical methods
- A new chapter of case studies providing concrete, real-world examples of environmental risk assessments

Quantitative Environmental Risk Analysis for Human Health is a must-have for graduate and advanced undergraduate students in civil engineering, environmental engineering, and environmental science, as well as for risk analysis practitioners in industry, environmental consultants, and regulators.



AEESP Membership

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!

Regular and Student Membership

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	\$130
Associate Professors	\$100
Assistant Professors	\$65
Affiliate Members	\$75
Students and Post-docs	\$20

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

Applying for regular membership is made by submitting a completed application form and a brief, 2 page curriculum vitae online with payment. Alternatively, application materials may be mailed to the Business Office with a check enclosed.

Affiliate Membership

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 \$75.

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.

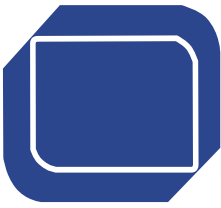
Annual dues for Sustaining Members are \$500. Organizations or individuals desiring more information on Sustaining Membership should write the Secretary, President, or Business Office.

Ready to join? You can apply for membership online!

<https://aeesp.org/membership>

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

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