



ENVIRONMENTAL SYSTEMS DIVISION NEWSLETTER

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APRIL 2022

The ESD Newsletter is a monthly newsletter involving ALL members of ESD. Members are encouraged to forward materials, authored papers on Environmental and Environmental Systems topics, and comments on newsletter topics or current events to the Editor. Your participation is greatly appreciated.

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1. ESD DIVISION NEWS

ESD CALL FOR NOMINATIONS

The ASME Environmental Systems Division is soliciting nominations to fill leadership positions.



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Leadership Qualifications

Individuals who have demonstrated leadership ability and knowledge that allow them to achieve the goals, mandates and interests of the ESD.

- **Chair**
- **Vice Chair**
- **Secretary/Treasurer**
- **Two Members-at-Large**
- **Liaison Committee – Chair and Vice-Chair**
- **Educational Support Committee – Chair and Members**
- **Honors and Awards Committee – Members**
- **Student/Early Career Competition Committee – Members**
- **Events Committee – Chair and Members**

Please submit your nominations for the following positions to herreral@asme.org by April, 19, 2022. Contact Laura Herrera, ASME TEC Operations Manager with any questions you may have.

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ASME IMECE 2023 ESD TRACK

If you want to volunteer to be Chair or Co-Chair or have ideas for specific sessions, please contact Arnie Feldman (jjdsenv@att.net).

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ESD's Waste Information Exchange (WIE) 2022

Call for technical chairs

ESD, the Research Committee on Energy, Environment and Waste (RCEEW) and the Materials Energy Recovery Division (MER), in conjunction with the Air and Waste Management Association (A&WMA) are planning a Waste information Exchange (WIE) in 2022 in the DC Metropolitan Area. The WIE is being modeled after the [Air] Information Exchange, which has been held annually since 1975 in Research Triangle Park (RTP), NC, in which USEPA (QAQPS and ORD) are key participants. The WIE will not require a written paper and any graphics used will be made available to attendees at the discretion of the speaker. The purpose of the Information Exchange is to make participation as a speaker as easy and simple as possible. The idea is to invite experts to come talk about research or regulations on which they are working without having to spend a lot of time in preparation. The WIE will cover policy updates, regulatory changes, and research on the latest waste topics.

ESD, RCEEW and MER are looking for individuals who want to participate in the planning including Track Chairs, Session Chairs, and Panel Chairs. In addition, ESD is looking for a Technical Chair to represent them on the planning Committee.

If you are interested in volunteering or want further information, please contact Arnold Feldman at jjdsenv@att.net.

Look for more information on the WIE in future ESD Newsletter's and on the web in Linked-In and Facebook. [Back to Newsletter's Page 1](#)

ICEM 2023 Call for Abstracts and Session Chairs



Nuclear Engineering and ESD, are pleased to announce Call for Abstracts. ICEM promotes a broad global exchange of information on technologies, operations, management, economics, and public policies in environmental remediation and radioactive waste management. This is a unique opportunity to foster cooperation among specialists from mature environmental management programs and those with emerging programs. The program Tracks and Topics are on the ICEM website (<https://event.asme.org/ICEM/Program>).

Abstracts for articles, papers and presentations are due Jan 29, 2023. Abstracts should be submitted on-line at <https://icem.secure-platform.com/a/organizations/main/home>. For additional information on submitting Abstracts please send an email to ASME at toolboxhelp@asme.org.

The ICEM Program Chairs, Martin Edelson and Jovica Riznic, request your help as Session Chairs or Co-Chairs. You can either volunteer for a specific Session/Topic or just in general. "Roles of the Session Chairs" is available to review duties.

For additional information please contact either Martin Edelson (mcedelson@gmail.com) or Jovica Riznic (Jovica.Riznic@cncs-ccsn.gc.ca). [Back to Newsletter's Page 1](#)



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ASME & ESD Community Pages

Please see our new ASME [ESD website](#).

The community pages were launched over 8 years ago. It was created as a way for volunteers to connect and share ideas. Platform use has decreased by over 70% from its peak years.

ASME takes your information security seriously. Staff is evaluating and safeguarding your security. On March 28, 2022, ASME sunsetted our eight-year-old ASME Community platform. In addition, the system does not meet today's benchmarks for functionality or information security and is no longer supported by its original developers.

<https://www.asme.org/topics-resources/society-news/asme-news/asme-community-platform-to-be-sunset>

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ASME & ESD In-person meetings (after pandemic)

In-person events are back! ASME will follow local laws, regulations and guidelines pertaining to Covid-19. From February 1, 2022, ASME in-person activities for students and members will follow guidelines applicable to the location of the event. These mandates are subject to change and continuously monitored. (<https://www.asme.org/anywhere>) **[Back to Newsletter's Page 1](#)**

2. ENVIRONMENTAL TECHNOLOGIES

Climate-Positive, High-Tech Metals are Polluting Earth, but Solutions Await

The rapid development of renewable energy technologies — including wind, solar and hydropower, and the commercial success of hybrid and fully electric vehicles — are helping put the world on track to achieve a net-zero carbon economy and meet Paris climate agreement targets. Yet these positive advances rely on a small number of “technology-critical elements,” or TCEs, rare materials whose mining, production and disposal are linked to myriad environmental problems, ranging from large-scale energy and water consumption, to serious soil, water and air pollution. These 30 to 35 TCEs are essential to computers, consumer electronics, solar cells, wind turbines, electric cars, plus military and medical applications. They include the platinum family of precious metals, rare-earth elements such as neodymium and scandium, and other metals such as cobalt, lithium and tungsten. What this diverse grouping has in common isn't some shared chemistry, but rather its technological necessity and geopolitical scarcity. They especially share indispensable characteristics — the ability to store energy or form permanent magnets, for example — that make them essential for technologies that could help meet the Paris goal of limiting global warming to 2° Celsius (3.6°



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Fahrenheit) above pre-industrial levels. But the reliance on TCEs to make high-tech green products puts these elements at risk of contributing to the breach of the nine planetary boundaries that demarcate habitable conditions on Earth.

Although most aren't rare, TCEs are seldom found in large deposits, so they're largely inaccessible to most living organisms. By extracting, using and discarding them widely, we are introducing them into new environments, with unknown consequences. That's one reason TCEs are of emerging concern to scientists as novel chemical entities and potentially harmful pollutants. While we know some things about TCEs and their production risks, we know little about what happens to them after manufacture and disposal. This is partly because their meteoric rise to global importance has left scientists and policymakers playing catch-up, and partly because of the "ultra-trace" concentrations in which they're used, making tracking challenging. At present, manufacturers make it extremely difficult for users to open and repair devices, with consumers prompted to replace smartphones and computers long before the end of their life spans. The answer: Product redesign to facilitate a circular economy, focused on making products more durable, easier to repair, and easier to break down into recyclable components. "Right to repair" policies, requiring manufacturers to make repairable products, are already gaining traction in the U.S. and Europe. But the application of a circular economy must go further with TCEs. (Ref. 1)

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Engineering an 'Invisible Cloak' for bacteria to Deliver Drugs to Tumors

Columbia Engineering researchers report that they have developed a "cloaking" system that temporarily hides therapeutic bacteria from immune systems, enabling them to more effectively deliver drugs to tumors and kill cancer cells in mice. By manipulating the microbes' DNA, they programmed gene circuits that control the bacteria surface, building a molecular "cloak" that encapsulates the bacteria. The researchers can regulate the time that bacteria survive in human blood, and increase the maximum tolerable dose of bacteria. They also showed our system opens up a new bacteria delivery strategy in which we can inject bacteria to one accessible tumor, and have them controllably migrate to distal tumors such as metastases, cancer cells that spread to other parts of the body." For the study published today by Nature Biotechnology, the researchers focused on capsular polysaccharides (CAP), sugar polymers that coat bacterial surfaces. In nature, CAP helps many bacteria to protect themselves from attacks including immune systems. "They hijacked the CAP system of a probiotic E. coli strain Nissle 1917," "With CAP, these bacteria can temporarily evade immune attack; without CAP, they lose their encapsulation protection and can be cleared out in the body. So we decided to try to build an effective on/off switch."

The group is exploring a range of research areas. There are more than 80 different types of CAP that exist just for E. coli and even more for other bacteria species that could be engineered using similar approaches. In addition, CAP is not the only molecule that bacteria have on their surface, and other surface molecules could be controlled in a similar fashion. Additionally,



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while iCAP is controlled by an externally provided IPTG in this example, other control systems such as biosensors could be used to autonomously control surface properties of therapeutic bacteria. The team, also affiliated with Columbia's Herbert Irving Comprehensive Cancer Center and Data Science Institute, notes that clinical translation is the next major challenge they would like to tackle. "While there is a good deal of laboratory research showing various ways to engineer microbes, it is very difficult to apply these powerful therapies to a complex animal or human body. We've shown proof of concept in mouse models, but given that humans are 250 times more sensitive to bacterial endotoxins than mice, we expect our results may have an even bigger effect on human patients than on mice,". "Bacterial cancer therapy holds unique advantages over conventional drug therapy, such as efficient targeting of the tumor tissue and programmable drug release. Potential toxicity has been limiting its full potential. The cloaking approach presented in this study may address this critical issue." (Ref. 2)

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3. ENVIRONMENTAL REGULATIONS

FERC Adopts a New Draft Policy for Consideration of Greenhouse Gas Impacts in Applications for Natural Gas Pipeline Certifications

As we previously reported below, the Federal Energy Regulatory Commission (FERC) in February issued two new policy statements likely to have far-reaching implications for the agency's approval of certificates of public convenience and necessity for natural gas facilities under the Natural Gas Act. The first, adds to and revises the list of factors FERC will consider when determining the need for a new natural gas facility. The second, as described below, substantially revises FERC's approach to analyzing greenhouse gases when performing environmental analyses of proposed new natural gas facilities. Both policies have proved controversial, generating substantial opposition both from Congress and from the natural gas industry. In response to this controversy, on March 24, 2022, FERC issued an order designating the new policies as draft and clarifying that the new policies will not be applied to applications received before the new policies go into effect.

Threshold for Preparation of an EIS: The interim policy sets a threshold of 100,000 metric tons per year of GHG emissions. The Commission will require any project that may emit more than 100,000 metric tons of GHGs to prepare an Environmental Impact Statement (EIS).

Direct Emissions: In quantifying GHG emissions, FERC will consider the direct emissions from construction and operation of a gas pipeline project, such as emissions from compressor stations, to be reasonably foreseeable. Such direct emissions therefore will always be considered in FERC's environmental analysis.

Indirect Emissions: FERC will consider upstream and downstream emissions – that is, emissions related to the production of natural gas carried by the pipeline and emissions from



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the use of gas that is transported by the pipeline – on a case-by-case basis. The test will be whether these emissions are a “reasonably foreseeable” consequence of granting a CPCN to the project.

Export Facilities: FERC will not consider either the upstream or downstream emissions of natural gas export facilities seeking approval under Section 3 of the Natural Gas Act.

Utilization and Offsets: In quantifying downstream GHG impacts, FERC will consider all evidence related to expected utilization rates of the gas transported by the pipeline and whether the gas will be used to offset or displace emissions from sources with higher rates of GHG emissions.

Mitigation: In conjunction with the EIS, the Commission will consider proposals by project sponsors to mitigate all or part of the project’s climate change impacts. In considering the proposals, the Commission may condition its approval on further mitigation of the climate change impacts in question.

CEQ Regulations: The Commission will follow regulations issued by the Council on Environmental Quality governing the preparation of environmental analyses under the National Environmental Policy Act (NEPA).

The Commission has solicited comments on the Interim GHG Policy Statement, which are due no later than May 2, 2022. While the new policy is not by its terms permanent, it provides a clear indication of how FERC is likely to treat GHG emissions in analyzing the environmental impacts of future applications for CPCNs under the Natural Gas Act. Parties with an interest in obtaining such certificates should therefore pay close attention to the GHG Policy Statement as a guide to developing an effective strategy to address GHG emissions in the environmental analysis process, including quantification of GHG emissions, offsets based on the downstream uses of natural gas, and mitigation measures. (Ref. 3) [**Back to Newsletter’s Page 1**](#)

FDA Gives Green Light to Gene-Edited Cattle

The FDA announced in March 2022 that Recombinetics’ gene-edited cattle received a low-risk determination for marketing products, including food, made from their meat. “This is the FDA’s first low-risk determination for enforcement discretion for an IGA [intentional genomic alteration] in an animal for food use,” the FDA reported. The agency stated that the gene-edited beef cattle do not raise any safety concerns because the gene modifications result in the same genetic make-up seen in so-called “slick coat” cattle, which are conventionally bred. According to the FDA. But are the conventionally bred cattle and the gene-edited cattle, known as PRLR-SLICK cattle, truly equivalent? The genomic alteration in the cattle is introduced using CRISPR, or Clustered Regularly Interspaced Short Palindromic Repeat, gene-editing technology.

CRISPR has been associated with unintended mutations that may not immediately be apparent, a concerning prospect since the genetic alterations are passed on to offspring.

The FDA, however, is allowing the technology to proceed anyway, stating that because it does not expect facilities producing PRLR-SLICK cattle using conventional techniques to register with them, it would not expect Recombinetics to do so either. They further state that food from both conventionally bred cattle and the gene-edited cattle is “the same,” based on data provided by Recombinetics. Recombinetics plans to have the gene-edited meat products available to “select customers in the global market soon” while general consumers will be able to purchase gene-edited meat in as soon as two years.¹⁸ The public, however, may not be thrilled with the idea, especially as many increasingly seek out real, whole foods in lieu of GMOs. One survey found only 32% of Americans are comfortable with GMOs in their food. (Ref. 4)

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4. EDITORIAL BOARD SELECTIONS

Climate-Induced Melting of Arctic Ice Threatens the Reemergence of Toxic Chemicals

A study published in Nature Reviews Earth & Environment warns that thawing of permafrost (a ground that remains completely frozen for two or more years) in the Arctic region can prompt the reemergence of greenhouse gases (e.g., methane and carbon dioxide), microbes, and chemicals (e.g., banned pesticides like DDT). Past research finds gases, microbes, and chemicals drift near the poles, becoming entrapped in ice under the accumulating snowfall. As the global climate continues to rise and the climate crisis worsens, studies like this show significant effects, as ice encapsulating these toxic chemicals is melting. Upon melting, some chemicals can volatilize back into the atmosphere, releasing toxicants into the air and aquatic systems, with the ensuing consequences. Microbes frozen for thousands to millions of years can also emerge from thawing permafrost, with unknown implications on human, animal, and ecosystem health. The melting permafrost is already beginning to impact infrastructure, creating sinkholes that damage roads, trees, and utility poles. Moreover, mixtures of chemicals, microbes, and greenhouse gases (GHGs) in permafrost are difficult to assess. Therefore, studies like this highlight the need to evaluate the health and ecological effects of melting arctic permafrost (and glaciers) from anthropogenic (human)-induced climate change.

Lack of adequate persistent pesticide regulations highlights the need for better policies surrounding pesticide use, especially when a toxic pesticide is banned for use in the U.S., but not for production and export to other countries. A switch from chemical-intensive agriculture to regenerative organic agriculture can significantly reduce the threat of the climate crisis by eliminating toxic, petroleum-based pesticide use, building soil health, and sequestering carbon. The Intergovernmental Panel on Climate Change (IPCC) finds that agriculture,

forestry, and other land use contributes about 23% of total net anthropogenic emissions of greenhouse gases, while organic production reduces greenhouse gas emissions and sequesters carbon in the soil. Learn more about how it is possible to sequester more than 100% of current annual CO₂ emissions by switching to organic management practices by reading *Regenerative Organic Agriculture and Climate Change: A Down-to-Earth Solution to Global Warming*. For more information about organic food production, visit the *Beyond Pesticides Keep Organic Strong* webpage. Learn more about the adverse health and environmental effects chemical-intensive farming poses for various crops and how eating organic produce reduces pesticide exposure. (Ref. 5) [**Back to Newsletter's Page 1**](#)

Can Regenerative Agriculture Transform Palm Oil?

On a 100-hectare plot of land nestled in Malaysia, farmers will soon begin an experiment that will turn the idea of a palm oil plantation on its head. Instead of establishing a monocrop, they will plant their oil palms alongside a lush understory of other crops and trees. They will shun chemical fertilisers in favour of organic compost, and start weeding manually to limit disturbance to the soil. The method he's referring to is regenerative agriculture, though some prefer the terms "agroecology", "climate-smart farming" or "conservation agriculture". While it doesn't have a strict definition, there are two linked goals at its core: to increase biodiversity and improve soil health on farmed lands. It achieves the first through techniques such as intercropping and agroforestry, which transform farmland into mixed-use systems combining commercial crops with native shrubs and trees; and the second via methods like no-till, cover-cropping and mulching, which involves returning organic waste back to the earth. These techniques aren't new: indigenous cultures have been practising them for centuries. But now, proponents are calling for their application across modern monocrops – from wheat to fruit and even livestock farms – where evidence is mounting that they can deliver ecosystem services, alongside economic and social benefits.

By enriching soils, this way of farming can boost yields and simultaneously reduce the need for harmful chemical fertilisers. Diversifying plant cover can provide habitat for wildlife and make crops more resilient to pests and disease – thus requiring fewer pesticides and herbicides. Meanwhile, careful soil management could also help lock away more carbon in the ground. And a landmark study recently showed that vegetables, wheat, beef and pork produced using regenerative methods were more nutritious than food farmed conventionally. For palm oil, that future still seems far off. Regenerative agriculture to produce this commodity is currently confined to just a handful of small farms. Because of the unique challenges of integrating it into palm oil systems, it's likely to be some time before we see trials on large industrial plantations, Leson believes. But buy-in from large companies willing to take a leap could send the right messages to the industry and pave the way forward. Meanwhile, pioneering farmers will continue testing regenerative agriculture out in the field. If the

experimental agroforestry plot delivers economic and environmental benefits, it could be expanded to hundreds of small-scale palm oil farms across the region, putting these measures into practice across several thousand hectares more. (Ref. 6) [Back to Newsletter's Page 1](#)

United States: What Are PFASs and What Actions Are Being Taken In The US to Regulate Them?

Per- and polyfluoroalkyl substances (PFASs) are a group of several thousand manmade chemicals – perfluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) are the best known – that began to be widely manufactured and used in the 1940s. PFASs are fluorinated alkyl molecules with different functional groups, in which the hydrogen atoms have been replaced with fluorine atoms. They are known as perfluorinated, where all of the hydrogen atoms have been replaced, and polyfluorinated when just a number of them have. Although as a family PFASs have certain defining characteristics, chemicals within it also have different chemical and physiological properties. Generally speaking, however, PFAS molecules have a hydrophobic 'tail' that contains the carbon-fluorine bonds and a hydrophilic 'head' that includes the functional group. As such they are able to dissolve in both oil and water, and also form a coating that is resistant to oil and water. And, as California's State Water Resources Control Board points out, PFAS molecules with longer fluorinated carbon chains also have a "unique ability to reduce the surface tension of liquids". In February 2018, the EPA issued an action plan detailing its strategy to address PFAS contamination. Under it the agency announced:

- plans to strengthen enforcement authority and clarify clean-up strategies by designating PFOA and PFOS as hazardous substances and developing interim groundwater clean-up recommendations;
- it is considering the addition of PFASs to the TRI under EPCRA and its rules to prohibit the uses of certain PFASs;
- plans to move forward with the MCL process for PFOA and PFOS and to determine whether regulation is appropriate for a broader class of PFAS;
- plans to propose nationwide drinking water monitoring for PFASs under the next Unregulated Contaminant Monitoring Rule monitoring cycle;
- it is to rapidly expand the scientific foundation for understanding and managing risk from PFASs; and
- it plans to develop a risk communication toolbox that includes multimedia materials and messaging for federal, state, tribal and local partners to use with the public.

On 18 October 2021, the Biden administration launched its strategic plan to combat PFAS pollution. This includes a multi-agency approach, including collective efforts from the Food and Drug Administration (FDA), US Department of Agriculture (USDA), Department of



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Transportation (DoT), Department of Defense (DoD), Department of Homeland Security (DHS), Department of Health and Human Services (DHHS), White House Council on Environmental Quality (CEQ) and the EPA. Some notable highlights of the plan are:

- the EPA is to monitor 29 PFAS compounds in drinking water via the Unregulated Contaminant Monitoring Rule (UCMR 5) programme;
- the FDA and USDA are to expand food supply testing and reporting to better understand dietary exposure to PFAS;
- a bipartisan infrastructure deal to address emerging contaminants through the State Revolving Funds and small and disadvantaged community programmes; and
- the DoD is to swiftly address PFASs at its sites throughout the country with clean-up assessments completed by 2023.

PFASs are hazardous and dangerous contaminants affecting the lives of millions. The attention given to cleaning up these chemicals and implementing infrastructure to mitigate their harmful effects, and particularly within the Biden administration, is a hopeful prospect for the future. (Ref. 7) [Back to Newsletter's Page 1](#)

This New Vegetable-Based Goo can Remove Microplastics from Water

Vegetables used as thickeners in stews and soups could soon help us eliminate microplastics from wastewater. According to a new study, a goo made from veggies like okra and fenugreek is as effective at drawing microplastics from water as specialized equipment — and much cheaper. You're forgiven if you don't recognize this as a common vegetable. Okra (*Abelmoschus esculentus*) is still unknown in many kitchens in Europe and the US, but it's very popular in the countries where it's grown, especially in Africa, India, the Middle East, and South America. Okra is about 5 to 10 centimeters long, looks like a green chili pepper, and is consumed in many different dishes. But this isn't a cooking story — it's a microplastics story.

A group of researchers has created a goo from okra and other plants (including aloe, cactus, and psyllium) that can clean water and wastewater from microplastics. If further developed, the goo could be a non-toxic and sustainable alternative to removing microplastic pollution. The emergence of microplastics, pieces of plastic 5 mm or smaller, has particularly raised concern, as it's very difficult to remove this waste once released into the water. Their size is so small that they can be transferred into clouds during evaporation and come down as rain, and then be transferred back to the ocean through the rivers. The team has long been investigating non-toxic alternatives. They first focused on food-grade plant extracts as a non-toxic approach to removing pollutants from wastewater originated from the textile industry. They used polysaccharides (the most abundant carbohydrate found in food) in the extracts as they have the right properties to attract and capture pollutants like dyes. At some point down the road, they started asking themselves if this approach couldn't be extended into microplastics. They



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used polysaccharide extracts from okra, cactus, aloe vera, tamarind, and fenugreek as flocculants to capture microplastics. They used compounds from individual plants and also tried them in different combinations.

In their experiments, they added the extracts to different water sources that contained microplastics and then looked at microscope images of the flocculant clumps before and after treatment, counting the microplastics to see how many had been removed. As it turns out, the whole thing was a success, removing microplastics from water. The combination of okra with fenugreek was the one that worked best to remove microplastics from ocean water, while okra paired with tamarind worked best for freshwater samples. Overall, using plant-based polysaccharides worked better than conventional approaches to eliminate microplastics, depending on the combination used. “It was found that the combination of polysaccharides were successful in removing 90% of the microplastics at 1 g/L as compared to 81% by polyacrylamide,” the researchers note in the abstract. The plant-based flocculants can be used in existing water treatment processes as it uses the same infrastructure. “We don’t have to build something new to incorporate these materials for water treatment purposes,”. This opens up a new set of possibilities to tackle microplastic pollution, but further studies will be required. The researchers will continue looking at different combinations of plant-based flocculants to improve microplastic removal from different water sources, including ocean water, freshwater, and groundwater. They want to scale up the process in field studies outside the lab and eventually commercialize this method so it can be used on an industrial scale. Other approaches have come to light in recent years but they also have to be further studied. Bacteria tend to group together and stick to surfaces, creating an adhesive substance called biofilm. A group of microbiologists suggested last year using this sticky bacteria property to create nets that capture microplastics in polluted water to form a recyclable blob. The study was not yet peer-reviewed and was presented at the spring meeting of the American Chemical Society (ACS). (Ref. 8)

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5. ESD NEWSLETTER READER COMMENTS

None received this month.

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ESD NEWSLETTER BOARD

Editor: DR. K. J. SREEKANTH – (sreekanthkj@kisar.edu.kw)

Assoc: DR. JAMES ZUCCHETTO – (jimzuc@comcast.net)



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ABOUT NEWSLETTER

ENVIRONMENTAL ENGINEERING features the application of environmental technologies to engineering systems to attain optimal performance according to established standards. The Newsletter of the Environmental Systems Division (ESD) will attempt to highlight a variety of environmental technology applications aimed at enhancing engineering systems performances in accordance with the latest standards by presenting excerpts of and links to selected articles from a variety of websites.

DISCLAIMER

Disclaimer: This newsletter may contain articles that offer differing points of view. Any opinions expressed in this publication do not represent the positions of the ESD Executive Board members of the American Society of Mechanical Engineers (ASME).



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Upcoming ASME Webinar [Conferences](#)

[41st International Conference on Ocean, Offshore & Arctic Engineering](#)

Congress Center Hamburg, Hamburg, Germany from June 5 – June 10, 2022

[Summer Heat Transfer Conference Co-Located with 16th International Conference on Energy Sustainability](#)

Philadelphia, Pennsylvania USA from July 11 – 13, 2022

[29th International Conference on Nuclear Engineering](#)

Shenzen, China and Virtual from August 8 – August 12, 2022

[International Design Engineering Technical Conferences & Computers and Information in Engineering Conference](#)

St. Louis Union Station Hotel, St. Louis, Missouri USA from August 14 – 17, 2022

[International Pipeline Conference](#)

Hyatt Regency - Telus Convention Centre, Calgary, Alberta, Canada from September 26–30, 2022

[International Additive Manufacturing Conference](#)

Lisbon, Portugal from October 19 – 20, 2022

[International Mechanical Engineering Congress & Exposition®](#)

Greater Columbus Convention Center, Columbus, Ohio USA from October 30 – November 3, 2022

ASME Technical & Engineering Communities (TEC) Update

- **On-demand & Live ASME TEC Talks are monthly one-hour webinar series that focuses on the varied disciplines of technical divisions.**
Upcoming talk by Dr. Ala Qattawi, Assistant Professor, The University of Toledo and Dr. Whitney Poling, Researcher, General Motors on *Opportunities and Challenges for Innovative Metal Manufacturing in the Automotive Industry*.
Date: April 14, 2022, Complimentary [registration](#) to ASME members.
- **ASME Town Hall: Dr Michael Roberts, International Space Station National Laboratory**
ASME is welcoming Dr. Michael Roberts, Chief Scientist of the International Space Station (ISS) National Laboratory. Hear the cutting-edge research being conducted in Lower Earth Orbit, the important role of mechanical engineering, and how you can get involved!
Date: April 25, 2022, **Time:** 1:00 pm EST, Complimentary [registration](#) to ASME members.



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ASME ENVIRONMENTAL SYSTEMS DIVISION (ESD) Executive Committee

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