American Chemical Society
Division of Environmental Chemistry

Call for Papers

ACS Spring 2025

San Diego, California & Online – March 23-27

Dear Colleagues,

On behalf of the ACS Division of Environmental Chemistry, it is my pleasure to invite you to share your recent research in the ENVR Program at **ACS Spring 2025** in San Diego, CA and online. This meeting will include in-person sessions and social events, plus limited virtual sessions.

New! Several ENVR symposia are hosted jointly by ENVR and other divisions. Abstracts may be entered into the Joint Symposia through any sponsoring division. Look for **(JS)** beside the symposium title.

New! Global Virtual Symposia **(GVS)** is a new initiative of the ACS Meetings that offers researchers to present their work online at ACS Spring 2025 across multiple GMT time zones to encourage researchers from Asia, Oceania, Africa, the Middle East, Europe, and Latin America to participate. Submit your abstract: https://www.acs.org/meetings/acs-meetings/spring/presenters/global-virtual-symposia.html?sc=240808_em_abstract_mtg_msg1_SPR25_GVS.

Abstract Submission: **August 5 – September 30, 2024**. Please submit abstracts to the Division of Environmental Chemistry at http://MAPS.ACS.org, To improve the overall meeting experience, ACS has discontinued recorded presentations, hybrid sessions and virtual posters. Submit abstracts for in-person oral, virtual oral, or in-person poster presentations as noted: **(V)** - Virtual Oral, **(IP-O)** – In-Person Oral, **(IP-P)** – In-person Posters.

Sincerely,

ENVR Spring Program Chair
Slawo Lomnicki, PhD
Associate Professor Department of
Environmental Sciences; LSU Superfund
Research Materials Core Leader
Louisiana State University
Slomni1@lsu.edu

Environmental Justice, Education, and Policy

Environmental Justice: Community engagement, education and action through green and sustainable chemistry and chemical engineering (IP-O), (V), (IP-P)

Edward Brush, ebrush@bridgew.edu; Laurel Royer, laroyer@carinalis.com; Jane E. Wissinger, jwiss@umn.edu; Loyd Bastin, lbastin@widener.edu; Nimrat Obhi, nimrat_obhi@beyondbenign.org; Tsvetanka Filipova, Tsvetanka.Filipova@sdsmt.edu, *Organizers*

Cosponsors: CES (formerly CEI), CHED, POLY

Financial Contributors: Beyond Benign, ACS Campaign for a Sustainable Future

This symposium will explore the growing need for the chemistry and chemical engineering enterprises to adopt green chemistry and green engineering principles and practices through the lens of environmental justice. The United States Environmental Protection Agency defines Environmental Justice "as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies . . .achieved when everyone enjoys: (1) The same degree of protection from environmental and health hazards, and (2) Equal access to the decision-making process to have a healthy environment in which to live, learn, and work". This symposium will engage a multi-stakeholder, multi-disciplinary discourse of speakers and participants focused on a re-evaluation of our business-as-usual practices through the lens of environmental justice: community groups and organizations, education (especially project-based and/or civic learning with environmental justice communities); careers at the intersection of green chemistry and environmental justice; sustainable chemistry technologies; sustainable engineering; connections to the UN Sustainable Development Goals; climate justice; policy statements; and industrial practices. The symposium will include an open discussion on Strengths, Opportunities, Aspirations and Results for the critical role that environmental justice will play in the chemistry and chemical engineering enterprises because it provides a framework to address global environmental and human health impacts that continue to disproportionately burden communities of color, vulnerable and low-income populations.

Perspectives on Climate Change Literacy & Education: Local to International (IP-O) (V) (IP-P)

Gregory Foy, gfoy@ycp.edu; Keith Peterman, peterman@ycp.edu, *Organizers*

Climate change literacy and education is one of four actions highlighted in the ACS Public Policy Statement on climate change. This symposium is designed for individuals to share perspectives on enhancing climate science literacy in the classroom or public forums. We invite papers that focus on efforts towards education, mitigation, adaptation, or other scientific issues surrounding this global crisis.

Technology and Engineering in Environmental Chemistry

(JS: ENVR-ENFL) **Separation Science and Technologies for Critical Materials** (IP-O) (IP-P)

Elias Nakouzi, Elias.Nakouzi@pnnl.gov; Grant Johnson, Grant.Johnson@pnnl.gov; Tanya Prozorov, tprozoro@ameslab.gov; Eunhyea Chung, echung@snu.ac.kr; Slawomir Lomnicki, slomni1@lsu.edu, *Organizers*

Cosponsors: GEOC

Critical materials like rare earth elements are increasingly needed for advanced electronics, clean energy, and defense-related technologies. Most of these materials are currently mined and extracted using energy- and chemical-intensive processes that generate environmentally harmful waste and carbon dioxide emissions. To establish a responsibly sourced and stable domestic supply chain for critical materials, it will be necessary not only to obtain these elements from primary ores but also to extract them from abundant unconventional feedstocks such as recycled electronics, produced waters, mine tailings, and geothermal brines. Transformative advances in critical material extraction and separation will be enabled by an improved fundamental understanding of 1) interfacial interactions, 2) the enthalpy and entropy changes associated with demixing transitions, 3) the coupling of reactivity and separations, 4) new synthesis techniques and the degradation of materials over time, 5) how external forces and fields may be leveraged to control transport and reactivity, and 6) supply chains to predict what elements will become critical in the future. Disruptive advances in separations will also require translating this fundamental scientific understanding into scalable and economically viable technologies. This symposium will provide a forum for chemists, chemical engineers, and materials scientists to learn about and discuss the latest developments in critical material separations, engineering, and technology. The forum's broad fundamental and applied scope is intended to attract leading researchers, early career scientists, and engineers from academia, national laboratories, and industry.

Critical Minerals Including Rare Earth Elements: Occurrences, Extraction Method Development, and Application **(IP-O)(IP-P)**

Sushil Kanel, Sushil.kanel.3.ctr@us.af.mil; Chia Suei Hung, chia-suei.hung.2@us.af.mil; John Boeckl, john.boeckl@us.af.mil; Mallikarjuna Nadagouda, Nadagouda.Mallikarjuna@epamail.epa.gov, *Organizers*

Critical minerals [Rare Earth Elements (REEs) and Co, Li, etc.) are essential for technology industries, including mobile devices, automobiles, colored glass, computers, smartphones, lamps, TV screens, lasers, lenses, and ceramics. As the demand for high technology increases due to population growth, these minerals become more essential. However, numerous challenges are related to the sustainable and environmentally friendly recovery and use of critical minerals in devices. These challenges include developing sustainable and ecologically friendly techniques to extract and purify critical minerals from sources such as minerals, sediments, industrial byproducts, and coal mining. This symposium aims to highlight the methods for obtaining and selectively separating REEs from their sources and applying them in various technologies. Presentations are solicited in one or more aspects of the selective purification of critical minerals and their applications: 1) Occurrences of critical minerals in various countries around the world; 2) Environmentally benign extraction and selective critical minerals reparation method; 3)Sustainable and environmentally benign extraction and selective reparation of critical minerals from their occurrence, e.g., from ores, mine tailings, coal, acid mine drainage, e-waste, wastewater, or other non-traditional sources, and 4) Application of critical minerals in material science and other fields. This symposium invites contributions on the above topics from researchers across academia, national laboratories, and industrial sectors to facilitate a well-rounded discussion of the field. We welcome fundamental and practical studies using

experiments, simulations, and theories on the listed topics. Research at any stage of development, including bench, lab scale, pilot scale, or natural fields, is encouraged.

Interdisciplinary Approaches to Environmental Challenges

(JS: ENVR-AGRO-AGFD-ANYL) Food Security: Tackling World Hunger CCC: Highlighting Chemistry from Multiple Divisions (IP-O) (V) (IP-P)

Kenny Xie, KYX@usp.org; Mike Morello, mjmorello226@gmail.com; Heidi Irrig, heidi.irrig@syngenta.com; Adeyemi (Yemi) Adeleye, asa2296@columbia.edu; Christy Haynes, chaynes@umn.edu, *Organizers*

Zero Hunger is one of the U.N. Sustainable Development Goals (SDG-2). The symposium will highlight how early career investigators from Food Security Convergent Chemistry Community (CCC) divisions (AGFD, AGRO, ANYL, ENVR) address global hunger challenges. The goal is to illustrate how early career investigators are applying chemistry to explore and overcome challenges in alleviating world hunger. It aims to cover sustainable agricultural practices, innovative food safety techniques, better environmental strategies, and more. We invite researchers, policymakers, industry professionals, and educators interested in chemistry's role in food security to attend. The event will facilitate interdisciplinary networking, promote scientific-policy integration, and explore international cooperation in food security. This symposium represents a vital platform for advancing global food security solutions through scientific collaboration and innovation. Travel awards are available for a total of 8 awardee duos (Principal Investigator for an oral presentation AND a graduate/undergraduate student for a poster presentation, 2 for each division). Details can be found on the division websites.

Solutions for Plastic Pollution (IP-O) (IP-P)

Yun Hang Hu, yunhangh@mtu.edu; Wei Wei, wwei4@mtu.edu), *Organizers*

Pollution caused by plastic wastes has become a serious environmental issue. The goal of this symposium is to bring active scientists and engineers, industry leaders, program managers of funding agents, and government policy makers to present their research findings, discuss challenges, and exchange ideas in the field of plastic pollution.

Environmental Chemistry Analysis

Attosecond Spectroscopy: From Atoms to Solution-Phase Chemistry – A Symposium Honoring Prof. Hans Jakob Wörner (IP-O) (V)

Virender K. Sharma, vsharma@tamu.edu; Zhong Yin, zhong.yin.e2@tohoku.ac.jp; Max Waters, maxdjw@stanford.edu; Angana Mondal; angana.mondal@phys.chem.ethz.ch, *Organizers*

Cosponsor: PHYS

Attosecond spectroscopy offers direct insight into the dynamics of electrons in matter. It therefore opens new perspectives for understanding the origins of chemical reactivity and for predetermining the outcome of chemical reactions by controlling electron motion. The symposium will honor Prof. Hans Jakob Wörner. Among various accomplishments, his group

has pioneered attosecond spectroscopy in the liquid phase, high-harmonic generation in liquids and X-ray transient absorption with table-top sources. The symposium will include invited and contributed oral and poster sessions. The topics that would be covered in this symposium, but not limited to, are: Attochemistry, attosecond transient absorption, attosecond photoelectron spectroscopy, the measurement of delays in photoionization and photoemission, high-harmonic spectroscopy in gases, solids, and liquids, as well as chiral dynamics.

Sensors and Data Analytics for Environmental Applications (IP-O) (IP-P)

Haoran Wei, haoran.wei3@wisc.edu; Silvana Andreescu, eandrees@clarkson.edu, *Organizers*

Cosponsors: AGRO, ANYL

In the field of environmental science and engineering, data generation often involves significant financial and labor resources. This symposium will highlight cutting-edge sensing technologies and analytical approaches that facilitate efficient environmental data collection, monitoring and assessment and enable real-time and cost-effective measurement of environmental parameters. We seek contributions that demonstrate how novel sensors and analytical technologies can reduce the time and cost associated with data collection, and potentially automate these processes. Submissions are encouraged in the following areas: 1) new types of sensors and analytical approaches for environmental monitoring; 2) integration of commercial sensors with environmental systems; 3) sensor network infrastructures, and data analytics that enable management and interpretation of vast amounts of data; 4) innovative data processing methods, such as multivariate statistical techniques, machine-learning algorithms, and other customized data processing approaches. These techniques are instrumental in extracting quantitative and qualitative information from large datasets, which can then be used to develop predictive models and decision-making processes related to environmental policy and management. Such models are invaluable for guiding the design of new environmental technologies and improving existing ones. By bringing together experts in sensor development and data analytics, this symposium aims to foster interdisciplinary collaboration and innovation. We envision a future where environmental data is readily accessible, efficiently processed, and effectively utilized to make informed decisions that benefit both our natural and engineered environments.

Environmental Chemistry at the Micro- and Nanoscales

(JS: ENVR-CELL**) Environmental Application of Nanocellulose** (IP-O) (V) (IP-P)

Nathalie Lavoine, nmlavoin@ncsu.edu; Lucian Lucia, lalucia@ncsu.edu Christie Sayes; christie_sayes@baylor.edu, *Organizers*

Increasing, concerted research efforts in nanocellulose (or cellulose nanomaterials) have led to the global development of pilot- and commercial-scale facilities that have enabled the production of a diversity of nanocelluloses in ton-per-day quantities to meet the (predicted) needs for high-volumes, commercial applications. Although cellulose is a renewable, biodegradable and biocompatible polymer, its nanoscale counterpart has been subject to environmental, health, and safety concerns, which has considerably slowed down its market transfer. This symposium aims to deliver the latest state-of-the-art in the field and to offer a platform to discuss the potential environmental impacts, safety, and toxicity of these nano- to micro-scale particles, while offering recommendations and suggestions to help to propel R&D efforts and product development in this field.

Applications & Implications of Nanomaterials in the Environment (IP-O) (IP-P)

Sushil Kanel, Sushil.kanel@wright.edu; Dr. Sudip Chakraborty, sudip.chakraborty@unical.it; Dr. Ichiro Imae, imae@hiroshima-u.ac.jp; Dr. Mallikarjuna Nadagouda, Nadagouda.Mallikarjuna@epamail.epa.gov; Dr. Sajan Silwal, ssilwal@semo.edu, *Organizers*

Population growth, rising water demands, degrading freshwater supplies, changing weather patterns, emerging contaminants, and stringent water quality standards have burdened existing water and wastewater treatment technologies and infrastructure. The escalating challenges of population growth, increasing water demands, deteriorating freshwater supplies, shifting weather patterns, the emergence of new contaminants, and the imposition of strict water quality standards have placed a significant strain on our current water and wastewater treatment technologies and infrastructure. The recent strides in nanotechnology present a crucial opportunity to develop sustainable, highly efficient, and cost-effective next-generation water and wastewater treatment processes (such as membrane separation, adsorption, and photocatalysis). In addition to treatment units, nanotechnology-enabled water and wastewater treatment also holds promise for disinfection and microbial control, as well as sensing and monitoring. This symposium is dedicated to exploring how nanomaterials in water and wastewater treatment systems can facilitate efficient separation, remediation, and detection to combat current and emerging contaminants without compromising human health and the ecosystem. Presentations are invited to delve into one or more aspects of the application of nanomaterials in water and wastewater treatment: 1) Synthesis, characterization, application, and regeneration of nano adsorbents (e.g., carbon nanotubes, nanofibers, nanoscale metal oxides, dendrimers, etc.), 2) Developing scalable and highly selective nanocomposite and nanofiber membranes with high permeability and antifouling properties is a critical area of research in water and wastewater treatment. These membranes can potentially revolutionize the field, and we invite contributions that explore their synthesis, characterization, and application, 3) Bioactive nanomaterials for water disinfection and microbial control, 4) Synthesis and optimization of photocatalytic nanoparticles, 5) Nanoparticle-based sensors for the detection of pathogens, heavy metals, and emerging contaminants. This symposium invites contributions on any of the above topics from researchers across academia, national laboratories, and industrial sectors to facilitate a well-rounded discussion of the field. Both fundamental and practical studies, experiments, simulations, and theory investigating these topics are encouraged. Research at any stage of development, including bench or lab scale to pilot scale, can be presented.

Micro & Nanoplastics in the Environment: Detection, Occurrence, Fate, and Toxicological Impact (IP-O) (IP-P)

Souhail Al-Abed, al-abed.souhail@epa.gov; Christie Sayes, Christie_Sayes@baylor.edu; Slawo Lomnicki, slomni1@lsu.edu, *Organizers*

Cosponsors: CELL, POLY

Growing concern over the increasing amount of plastic waste in the environment has led to a focus on micro and nanoplastics. Plastics exposed to environmental conditions undergo physical and chemical degradation into micro- (< 5 mm) and nano-sized (< 1 μm) particles. Micro and nanoplastics are ubiquitous and persistent. There is a need for standardized methods that can be applied for sample collection, separation, detection, and characterization. In addition, there is a lack of sufficient research micro and nanoplastic-induced toxicological effects. Micro and nanoplastic particle reference materials are needed to standardize methodologies and perform environmental risk assessments. This symposium will feature studies that address knowledge gaps and expand on current experimental methods.

Microplastics, Nanoplastics, and Plastic Additives: Emerging Techniques for Detection and Assessing Environmental Impacts (IP-O) (IP-P)

Phillip Potter, potter.phillip@epa.gov, *Organizers*

Microplastic (anthropogenic polymer particles < 5 millimeters in diameter) research is an evolving field that has recently grown to include nanoplastics (< 1 micron in diameter) and plastic additives, such as dyes, fillers, plasticizers, and UV stabilizers. There are extensive ongoing efforts to better detect and characterize these materials, as well as assess their impact on the human body and ecosystems. This symposium will focus on advances in: (1) analytical techniques for detecting and characterizing microplastics, nanoplastics, and plastic additives; (2) fate and transport of these materials in the environment and biological systems; (3) efforts to prevent the release of these materials or remediate them in the environment.

(GVS) Advanced Nanomaterials for Water Research: Innovations in Treatment, Sensing and Purification (V)

Shobha Shukla, Indian Institute of Technology Bombay, India; Sumit Saxena, Indian Institute of Technology Bombay, India; Krishna Raghav Chaturvedi, *Organizers*

Advanced nanomaterials play a pivotal role in water research, offering crucial advancements in treatment, sensing, and purification technologies. Carbon-based nanomaterials such as graphene-based composites and carbon quantum dots are notable for their unique properties, such as their large surface area and active surface functionalities, making them ideal for diverse applications such as dye and oil removal, heavy metal sensing, water desalination, and purification. The integration of nanomaterials in water research holds significant promise for addressing global water challenges and improving water quality and accessibility.

Advancing Water Chemistry Technologies

Aquatic Photochemistry (IP-O) (IP-P)

Organizers Kristopher McNeill, kristopher.mcneill@env.ethz.ch; William Arnold, arnol032@umn.edu; Garrett McKay, gmckay@tamu.edu; Kimberly Parker, kmparker@wustl.edu

Cosponsors: ANYL, GEOC

Aquatic photochemical transformations are important in geochemistry and environmental chemistry in diverse contexts, from natural systems where sunlight is acting on surface waters to engineered systems using UV irradiation. Light may act directly upon target compounds or indirectly through interactions with redox-active species including minerals, dissolved organic matter, and small molecule sensitizers. Understanding the roles of photochemistry in these complex systems provides insight into the fate of chemical and biological species in the environment. In this symposium, we invite submissions that explore the direct and indirect photochemical transformations of natural and anthropogenic compounds, as well as interactions of light with organic matter, biomolecules, redox-active minerals, and microorganisms. Topics that would be covered in this session include, but are not limited to: 1) Photochemistry of dissolved organic matter; 2) Reactive oxygen species; 3) Photochemistry in water/wastewater treatment or aqueous aerosols; 4) Ice or plastic photochemistry; 5) Photochemical transformation

of pollutants; 6) Photochemistry of biomolecules; 7) Photochemical disinfection; 8) Photochemically driven element cycling; 9) Field studies.

Aquatic Redox Chemistry (IP-O) (IP-P)

Christopher Gorski, cag981@psu.edu; Jasquelin Peña, pena@ucdavis.edu; Paul Tratnyek, tratnyek@ohsu.edu, *Organizers*

Cosponsor: GEOC

This session invites presentations focused on recent developments in aquatic redox chemistry. Redox reactions play critical roles in determining the quality, chemistry, and biology of aquatic systems. These reactions can occur naturally, be driven by electrochemical reactions, or be caused by the addition of chemical reactants. Elucidating the mechanisms, pathways, kinetics, and implications of these redox reactions is essential for understanding and modeling natural biogeochemical processes and designing engineered water treatment processes. In this broad and inclusive session, we invite contributions on recent developments that explore all aspects of aquatic redox chemistry, from mechanistic molecular-based studies to field-scale experiments and simulations. We particularly encourage contributions that examine interfacial redox reactions at mineral-water interfaces or electrodes and photochemically driven redox reactions. We additionally invite contributions that make use of novel experimental and analytical techniques to study aquatic redox reactions, such as those that use electrochemical, spectroscopic, and computational modeling techniques.

Electrified Wastewater Management (IP-O) (IP-P)

Shiqiang (Nick) Zou, shiqiang@auburn.edu; Mohan Qin, mohan.qin@wisc.edu; Neha Sharma, nehash@stanford.edu; William Tarpeh, wtarpeh@stanford.edu, *Organizers*

Revolutionizing wastewater management is crucial for accessing valuable resources, such as critical nutrients and metals, sustainable energy and fuels, and reusable freshwater. Despite the promise of electrochemistry in driving this transformation, a substantial gap persists in integrating electrification with wastewater management. This session seeks to address this unmet need for implementation by overcoming diverse obstacles, including thermodynamic barriers linked to the restricted electrochemical window of wastewater, kinetic challenges arising from the transformation of refractory pollutants, and mass transport obstacles intrinsic to the dilute nature of target substances in wastewater matrices. We will focus on both fundamental and applied research at the convergence of electrochemistry, process engineering, and wastewater management. Potential topics include (1) electrified wastewater refining of nutrients, metals, and biofuels, (2) electrified transformation of refractory pollutants, (3) electrified chemical production to decontaminate waste streams, (4) electrified design of membrane processes and sensors, and (5) life-cycle and techno-economic assessment (LCA & TEA) of electrified wastewater operations and their footprints. We encourage submissions utilizing either authentic or synthetic wastewater resembling real-world compositions to help identify barriers in electrifying the wastewater management sector.

Stakeholder-Informed Water Treatment Methods for Resource-Limited Settings (IP-O) (V) (IP-P)

Michael Bono, mikebono@mit.edu; Antonia Filingeri, antonia.filingeri@unipa.it, *Organizers*

Selecting an appropriate water treatment approach for a given setting is highly context-dependent, with sensitivity to the local water source chemistry, stakeholder needs, policy initiatives, and existing infrastructure. An understanding of stakeholders' needs benefits

decision-making throughout the development and implementation of new water treatment approaches, from initial technology selection through deployment. It is particularly challenging to identify stakeholder needs when developing new water treatment solutions for resource-limited settings due to the frequent geographic or socioeconomic separation between researchers and the intended end users. Implementation of those solutions poses additional challenges that reflect the complexity of building relationships with key stakeholders and integrating solutions with existing infrastructure and policy. This symposium will present advances in the development and implementation of water treatment approaches that have been informed by stakeholder engagement, with a focus on solutions intended for resource-limited settings. We invite submissions that illustrate how engagement with stakeholders via methods such as interviews, workshops, or strategic collaborative partnerships has informed key technical decisions during the development of water treatment approaches that focus on resource-limited settings. Water treatment approaches can include desalination, removal of trace contaminants, and disinfection of microbial contamination. Resource-limited settings can include underserved regions in high income countries as well as underserved regions in low- and middle-income countries (LMICs).

Atmospheric Chemistry

(JS: ENVR-ENFL-CATL) Catalysis For Decarbonization of Industrial Processes (IP-O)

Cesar Ovalles, covalles@gmail.com; Alan Allgeier, alan.allgeier@ku.edu; Fan Shi, fan.shi@netl.doe.gov, *Organizers*

Catalysis plays an essential role in reducing CO_2 emissions by increasing energy efficiency, reducing carbon emissions, capturing carbon dioxide, and converting it to a myriad of products that require a carbon feedstock. Several examples of sustainable catalytic processes have been reported in the literature for the production of fuels, chemicals, and polymers. In this symposium, we plan to invite industrial leaders and prominent scholars from academia and national labs to discuss state-of-the-art catalysts and catalytic technologies to find sustainable solutions for the decarbonization of the world's industrial complex. A wide range of topics will be covered, including, New and highly selective homogeneous and heterogeneous catalysts and processes for low carbon intensity (CI) fuels, chemicals, and polymers; Bioenergy with Carbon Capture and Storage catalytic processes, including biofuels and biomass converting routes; Electro- and bio-based catalytic routes for low CI products and fuels; Improved catalytic plastic recycling processes and catalysts; Catalysts for reducing pollutant emissions and improving environmental performance; Responsible extraction and processing of natural resources, particularly as relates to catalysts; Enhanced catalytic reactor designs and process integration schemes for decarbonization; State-of-the-art thermal- and electro-catalytic water treatment processes; and Life cycle analysis and techno-economic studies of catalytic processes for industrial decarbonization.

CO_2 Sequestration a Global Challenge Toward Future Opportunities (IP-O) (IP-P)

Benoit Rugabirwa, rugaben@gmail.com; Jean Nepo Hakizimana, nepo07@hotmail.fr, *Organizers*

Cosponsors: CATL

Financial Contributors: College of Education (University of Rwanda)

The concept of atmospheric net zero CO_2 is an emerging global preoccupation of the scientific communities and governmental policy makers in the mitigation of the registered global climate change-related problems, which in the first place, implicate the current global warming of the Earth. Two important challenges concerning the inefficiency of the existing CO_2 reduction techniques and the balance between energy cost vis à vis the expected CO_2 reduction output constitute the current state-of-the-art in the research. Though CO_2 is seen as a global threat, however, it is an important source of chemical materials, which should be mitigated in the path of materials synthesis. We would discuss the existing limitations in CO_2 reduction techniques and potential utilization of the sequestrated CO_2 for a global prosperous future.

Showcasing Emerging Science in Atmospheric Chemistry (IP-O) (IP-P)

Rachel O'Brien, reobrien@umich.edu; Vicki Grassian, vhgrassian@ucsd.edu; Tori Barber, vbarber@chem.ucla.edu; Jean Rivera Rios, jr1902@chem.rutgers.edu, *Organizers*

The field of atmospheric chemistry has grown in the past decade to cover the fields of outdoor and indoor atmospheric chemistry. This symposium will include invited and contributed talks in exciting emerging science topics across the field of atmospheric chemistry. We welcome abstracts with topics that span field, laboratory, and modeling studies at the nexus of air quality, climate, marine science, indoor air chemistry, environmental justice, community engagement, and health. The symposium will also highlight the role of the new ACS journal ES&T Air launched in 2023 with invited talks from scientists and editors who have published in ES&T Air.

Addressing PFAS and Sustainability Challenges

Advances in PFAS Research and Outlook (IP-O) (IP-P)

Manoj Shukla, Manoj.K.Shukla@usace.army.mil; Dr. Manoj Kolel-Veetil, manoj.kolel-veetil@nrl.navy.mil; Dr. Mallikarjuna Nadagouda, nadagouda.mallikarjuna@epa.gov; Dr. Nancy Kelley-Loughnane, nancy.kelley-lough nane.1@us.af.mil, *Organizers*

Per-and polyfluoroalkyl substances (PFAS) are manmade chemicals and have been widely used since their development in 1940s. These synthetic compounds are resistant to degradation due to the presence of carbon-fluorine (C-F) bonds and are nicknamed as “forever chemicals”. PFAS have been also used in military within aqueous film forming foams (AFFF) for fire training and emergency response purposes. It is estimated that around 110 million Americans find PFAS contamination in their drinking water supplies. Exposure of PFAS including their short-chain cousins has been linked to several health related issues such as cancer, elevated cholesterol, obesity in humans. Recently, the U.S. Environmental Protection Agency (EPA) finalized critical rule to designate perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) as hazardous substances under CERCLA. Various traditional techniques have been attempted to degrade and remove PFAS from contaminated media. The incineration of PFAS with other wastes have potential to produce the active greenhouse gases. This symposium will discuss recent advances in research efforts on the degradation, destruction, detection, isolation, removal, and sensing of PFAS. Moreover, research on fluorine free PFAS alternatives and toxic effects of PFAS will also be discussed.

Advancing PFAS Treatment, Remediation, and Understanding: Unveiling Fundamental Chemistry to Overcome Environmental and Health Challenges (IP-O) (IP-P)

Lei Guo, leiguo@uark.edu; Lee Blaney, blaney@umbc.edu; Narasimhan Loganathan, naresh20@msu.edu; Diana S. Aga, dianaaga@buffalo.edu; Angela K. Wilson, akwilson@msu.edu, *Organizers*

The widespread occurrence and detection of per- and polyfluoroalkyl substances (PFAS) have raised significant global concerns due to their detrimental effects on ecosystems and human health. Scientists and engineers have been actively developing methods for measuring, treating, and remediating PFAS-contaminated sites, but technical challenges persist. These challenges are partially rooted in the unique physicochemical properties of PFAS, stemming from their C-F chemistry. This symposium will cover recent advancements in PFAS measurement (e.g., analysis, sensing), concentration (e.g., adsorption, ion exchange, and other enrichment technologies), and destruction (e.g., physical, chemical, and thermal treatment). Abstracts on related topics are also welcome. This symposium will place a special emphasis on how deep understanding of underlying PFAS chemistry can elucidate new mechanisms for PFAS analysis, concentration, and degradation through technological improvements related to the design and application of new sensors, sorbents, and destructive technologies.

AIChE/ACS Frontiers of Chemistry, Materials Science & Chemical Engineering for Circular Economy (IP-O) (V) (IP-P)

Alexander Orlov, alexander.orlov@stonybrook.edu; Shweta Singh, singh294@purdue.edu; Jason Trembly, trembly@ohio.edu, *Organizers*

Financial Contributors: AIChE

This symposium will highlight the latest developments in environmental/green chemistry, materials science and chemical engineering that lay foundations for developing circular economy of the future. It will offer sustainable solutions for numerous environmental problems by focusing primarily on waste prevention as a primary strategy with secondary strategy focused on waste recycling. For example, specifically it will include such important topics as waste plastics, reuse of construction and other materials, critical materials (such as rare earth metals) that can be of interest to both ACS and AIChE communities. The submissions can include both experimental results and modeling to demonstrate a clear link of the research to circular economy and sustainability.

Lithium-Ion Batteries: Benefits, Management, Safety and Environmental Implications (IP-O) (IP-P)

Souhail Al-Abed, al-abed.souhail@epa.gov; Endalkachew Sahle-Demessie, Sahle-Demessie.Endalkachew@epa.gov; Dylan Shields, shields.dylan@epa.gov, *Organizers*

Cosponsor: ENFL

Lithium-ion batteries (LIBs) are primed to be an indispensable future tool in the world's quest to curb global warming by investing in low-carbon technologies and mobile and stationary energy storage system applications. As the need and application of LiBs proliferate, research on the environmental impact of LIBs becomes essential on many fronts. We invite presenters to showcase their research related to the benefits and advancement of LIBs in terms of design and relation to safely managed and recycled. Additionally, we welcome presentations on topics related to LIB fire risk and associated emissions, potential environmental impacts for LIB waste, safe and rapid discharge methodologies of LIB before disposal and recycling, and practical suggestions to overcome these challenges for a promising circular economy for LIB materials

(GVS) Sustainable Solvents (V)

Prof. Ramesh Gardas, Indian Institute of Technology Madras, India; Prof. Jitendra Sangwai, Indian Institute of Technology Madras, India, *Organizers*

The development of green and sustainable chemistry has become essential due to mounting environmental concerns and the urgent need to address climate change. Traditional organic solvents, widely used across various industries including chemicals, pharmaceuticals, and oil and gas, pose significant drawbacks such as high volatility, poor recovery efficiency, and adverse health effects. This symposium, titled "Sustainable Solvents," aims to bridge the existing research gap by bringing together experts to explore innovative alternatives to conventional solvents. The specific focus will be on emerging solvents like ionic liquids, deep eutectic solvents, and those derived from natural sources, aiming for eco-friendly solutions with minimal environmental impact. It also provides a platform to discuss solvent safety, ensuring the well-being of humankind and the environment. Through interdisciplinary presentations, discussions, and knowledge exchange, this symposium will pave ways for advancing the adoption of sustainable solvents, fostering a more resilient and environmentally conscious chemical industry.

Chemical, Physical and Biological Processes in the Environment

Environmental Contaminants: Environmental Impacts, Exposure, and Toxic Effects (IP-O) (IP-P)

Carrie A. McDonough, cmcdonou@andrew.cmu.edu; Carsten Prasse, cprasse1@jhu.edu; Rachel Smolinski, rsmolins@andrew.cmu.edu; Matt Newmeyer, mnewmey1@jhmi.edu; Yanan Chen, yananc@andrew.cmu.edu, *Organizers*

Cosponsors: ANYL, BIOL, TOXI

A wide range of chemicals and chemical mixtures are released by human activity, including both “legacy” chemicals that have long been recognized as environmental contaminants and “emerging” chemicals of concern. Advances in analytical instrumentation, environmental monitoring, exposomics, and computational chemistry are paving the way towards a better understanding of the environmental implications and human health impacts of anthropogenic chemical releases. This symposium will showcase recent advances that contribute to our understanding of environmental contaminants, including the characterization of contaminant mixtures and structural determination of novel contaminants as well as exposure, toxicokinetics, and health impacts of these chemicals in humans and wildlife.

Fate of Organic Contaminants in Climate Change Disasters: Dynamics, Transformation, and Mitigation (IP-O) (IP-P)

Chris Olivares, chris.olivares@uci.edu; Jessica Ray, jessray@uw.edu, *Organizers*

Cosponsors: BIOL, CHED, GEOC

Climate change-induced disasters such as floods, droughts, hurricanes, and wildfires significantly alter the environmental behavior of organic contaminants. This conference session explores the multifaceted impacts of these extreme events on organic pollutants, delving into their chemical reactivity, transport mechanisms, biogeochemical transformations, and strategies for resilient remediation. We invite abstracts that investigate the influence of climate-induced stressors on the reactivity of contaminants such as pesticides, flame retardants, and pharmaceuticals, and industrial chemicals. Studies examining shifts in transport pathways due to

altered hydrological and atmospheric conditions, including stormwater and runoff dynamics, are especially welcome. Additionally, we seek contributions that explore biogeochemical changes, including microbial and chemical degradation processes, driven by extreme environmental conditions. Emphasizing the need for adaptive and resilient remediation techniques, we also encourage submissions on climate-adaptive solutions and innovative approaches to mitigate contamination, including passive treatment methods and nature-based solutions such as constructed wetlands and vegetative buffer zones. This session aims to foster interdisciplinary dialogue, integrating insights from chemistry, environmental science, and engineering to develop a holistic understanding of the fate of organic contaminants under climate change stressors.

Interactions Between Geological Materials and Gases in Energy and Climate Contexts (IP-O) (IP-P)

Tuan A. Ho, taho@sandia.gov; Chelsea Neil, cwneil@lanl.gov; Qingyun Li, qingyun.li@stonybrook.edu, *Organizers*

Cosponsors: GEOC

This symposium focuses on advances in experimental and simulation techniques aimed at understanding interactions among subsurface materials and gases relevant to application in energy and climate. The phenomena encompass adsorption, chemical reactions, phase changes, chemo-mechanical effect, etc., involving gases such as CH4, CO2, H2S, NOx, H2 within materials such as clay, oxides, organic matters, soil. The applications relevant to these phenomena include, but are not limited to, CO2 capture and sequestration, natural gas extraction, H2 geological storage, gas purification, gas detection, and sensors.

Honorary and Invited Symposia

ACS Award for Creative Advances in Environmental Science & Technology (IP-O)

Virender K. Sharma, vsharma@tamu.edu, *Organizer*

Financial Contributors: Aerodyne Research

By invitation only. This ACS National Award symposium will the recipient of the 2025ACS Award for Creative Advances in Environmental Science & Technology, sponsored by ENVR and Aerodyne Research. The award was established to encourage creativity in research and technology or methods of analysis to provide a scientific basis for informed environmental control decision-making processes or to provide practical technologies that will reduce health risk factors.

ES&T Journals Award Session for James J. Morgan Early Career Lectureship and Outstanding Achievements in ES&T Award (IP-O) (V)

Carlos Toro, c_toro@acs.org, *Organizer*

Cosponsors: Environmental Science & Technology, Environmental Science & Technology Letters

By invitation only. This symposium celebrates the winners of the 2025 James J. Morgan Early Career Lectureship and Outstanding Achievements in Environmental Science & Technology Awards. The James J. Morgan Early Career Lectureship recognizes early career researchers who are pursuing new ideas, persisting despite adversity and pushing the environmental science and

technology community in exciting directions. The Outstanding Achievements award recognizes individuals who have contributed to fields of environmental research that have substantially contributed to improvements in human health and/or the environment, and whose work may have been adopted into new public policies, new devices or treatment systems, or widely adopted by industry and/or researchers. The session features oral presentations by the winners of both awards alongside other invited speakers.

Attosecond Spectroscopy: From Atoms to Solution-Phase Chemistry – A Symposium Honoring Prof. Hans Jakob Wörner **(IP-O) (V)**

Virender K. Sharma, vsharma@tamu.edu; Zhong Yin, zhong.yin.e2@tohoku.ac.jp; Max Waters, maxdjw@stanford.edu; Angana Mondal; angana.mondal@phys.chem.ethz.ch, *Organizers*

Cosponsor: PHYS

Attosecond spectroscopy offers direct insight into the dynamics of electrons in matter. It therefore opens new perspectives for understanding the origins of chemical reactivity and for predetermining the outcome of chemical reactions by controlling electron motion. The symposium will honor Prof. Hans Jakob Wörner. Among various accomplishments, his group has pioneered attosecond spectroscopy in the liquid phase, high-harmonic generation in liquids and X-ray transient absorption with table-top sources. The symposium will include invited and contributed oral and poster sessions. The topics that would be covered in this symposium, but not limited to, are: Attochemistry, attosecond transient absorption, attosecond photoelectron spectroscopy, the measurement of delays in photoionization and photoemission, high-harmonic spectroscopy in gases, solids, and liquids, as well as chiral dynamics.

General Environmental Chemistry

Graduate Students and Early Career Researchers Symposium: Promoting Engagement and Innovations in Environmental Science and Engineering **(IP-O) (IP-P)**

Silvana Andreescu, eandrees@clarkson.edu; Haoran Wei, haoran.wei3@wisc.edu; Kevin O'Shea, osheak@fiu.edu, *Organizers*

This symposium aims to provide a platform for graduate students and early career researchers (e.g., postdoctoral researchers) to present their cutting-edge research and promote professional engagement in environmental sciences and engineering. The symposium will cover a broad range of topics including but not limited to environmental monitoring, materials and technologies for pollution prevention, sensors and data analytics, treatment and destruction technologies, sustainability, environmental health, environmental resilience and climate change mitigation. Participants will have the opportunity to share their innovations on the development and application of novel technologies, advanced data analytics, and environmental management practices. By bringing together early career scientists from diverse backgrounds, the symposium seeks to foster a community of young researchers dedicated to addressing global environmental challenges through the exchange of ideas and open-ended discussions on emerging trends and future research needs to advance environmental health and sustainability. A panel of ENVR stakeholders will lead the discussion on career opportunities and provide advice on professional development, and job-search strategies over a funding dependent networking lunch. The symposium will recognize participants with awards for the best presentations to be chosen by a panel of technically diverse judges.

(JS: ENVR-CHED) Undergraduate Research Posters: Environmental Chemistry (IP-P)

Nicole DiFabio, n_difabio@acs.org; Ryan Sweeder, sweeder@msu.edu; Faith Yarberry, fyarberry@uca.edu; Pamela Clevenger, pwclevenger@gmail.com, *Organizers*

Cosponsors: CHED

Undergraduate student presenters only. This poster session is a subset of the meeting-wide Division of Chemical Education Undergraduate Poster Session and will be presented separately from ENVR Posters.

General Advances in Environmental Chemistry and Technology (IP-O) (V) (IP-P)

Slawo Lomnicki, slomni1@lsu.edu; Hanoz Santoke, hsantoke@csub.edu, *Organizers*

This symposium is open to papers and posters on environmental chemistry or environmental engineering that may be beyond the focus of the specific topics addressed in other ENVR symposia.

Virtual Graduate Student Symposium in Asia-Pacific Region on Current Environmental Issues (V)

Chunxiao Zheng, czheng@acs-i.org, *Organizer*

This virtual symposium is initiated and co-organized by Southwestern China Chapter. Graduate students in the Asia-Pacific region are welcome to showcase their most recent research on Environmental Chemistry and gain experience as oral speakers at an international setting. We will try to arrange all the presentations during day time in the region. The symposium will cover all aspects of Environmental Chemistry and in particular will focus on Water and Waste Water Treatment, Advanced Oxidation Processes, Emerging Contaminants and Environmental Nanotechnology.

Interdisciplinary Symposia Cosponsored by ENVR

(JS: PRES-COMSCI]) Global Challenges and Advances in Energy, Food and Water Sustainability in the Face of Climate Change

Dorothy Phillips, Robert Wingfield, Young-Shin Jun, ysjun@wustl.edu; Laura McConnell, laura.mcconnell@bayer.com, *Organizers*

Cosponsors: ENVR, AGRO

This symposium will highlight advancing chemistry innovations to address the interrelated challenges articulated in the U. N. 2030 Sustainable Development goals: Goal 2, Zero Hunger; Goal 6, Clean Water and Sanitation; Goal 7, Affordable and Clean Energy; and Goal 13, Climate Action.

[CHAL] Chemistry, the Law, and the Environment

Cosponsor: ENVR

[NUCL] Environmental Radiochemistry

Julia Neumann, jneumann@anl.gov; Sara Saslow, sarah.saslow@pnnl.gov, *Organizers*

Cosponsors: ENVR, GEOC

Understanding the mobility of radionuclides and heavy metals in nature plays a pivotal role in developing appropriate remediation strategies for these (radioactive) pollutants. This session will highlight recent scientific advancements and challenges for understanding the physicochemical processes that control the fate, transport, and remediation of radionuclides and heavy metals in various environmental compartments. Contributions focused on elucidating processes relevant to (1) reactivity at mineral/water interfaces, including adsorption and desorption, (2) radionuclide/heavy metal incorporation into mineral phases and/or assemblages, (3) redox chemistry, (4) radionuclide/heavy metal speciation, (5) colloid formation and transport, and (6) radionuclide/heavy metal immobilization by remediation technologies are of interest to this session. Exploring and predicting the behavior of radionuclides and heavy metals under the complex chemistries found in nature are also of interest, e.g., the effects of co-mingled competing contaminants and local biogeochemistry. By fostering interdisciplinary dialogue among experts from different fields, spanning computational to experimental research at molecular to field scales, this session aims to advance our collective understanding of environmental radiochemistry and promote sustainable solutions for managing radioactive contamination worldwide.

(JS: GEOC-YCC) Sun, Sand, and Sustainability: Early Career Researchers Forging Advances in Marine Chemistry

Julian Bobb, julianbobb770@gmail.com; Bhavya Singhi, bsinghi@zeusinc.com, O*rganizers*

Cosponsors: ANYL, ENVR

This symposium is open to all topics of marine chemistry, geochemistry, environmental chemistry, and closely related fields. We are especially looking for presentations from early career researchers who are currently in school or within 10 years of starting their career. This session aims to publicize innovative research findings geared towards addressing the impact of human and environmental factors on oceans and marine ecosystems, and the strategies being explored to mitigate those effects.

[COMSCI] Clean Water Initiative

Young-Shin Jun, ysjun@wustl.edu; Warren Lin; Alvin Collins, *Organizers*

Cosponsors: ORGN, ENVR

By invitation only