American Chemical Society
Division of Environmental Chemistry
Call for Papers
ACS Spring 2022 – Bonding Through Chemistry
San Diego, California – March 20-24, 2022

Dear Colleagues,

On behalf of the ACS Division of Environmental Chemistry, it is my pleasure to invite you to share your recent research and results in the Division of Environmental Chemistry at the American Chemical Society National Meeting in San Diego, California. This will be a hybrid meeting, with in-person and virtual technical programming.

Abstract Submission Deadline: **October 11, 2021**. Please submit abstracts to the Division of Environmental Chemistry at http://MAPS.ACS.org. Abstracts will be accepted for oral and/or poster presentation in each symposium unless otherwise noted. Symposium details are available at https:// https://callforabstracts.acs.org/acsspring2022/ENVR.

Sincerely,

ENVR Spring Program Chair
Slawo Lomnicki
Slomni1@lsu.edu

ACS National Meeting Thematic Symposia: Bonding Through Chemistry

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Virtual Graduate Students Symposium in Asia-Pacific Region on Current Environmental Issues
Organizers: Chun Zhao, pureson@163.com
Chunxiao Zheng, czheng@acs-i.org
This virtual symposium is initiated and co-organized by Southwestern China Chapter. The graduate students in 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.

Water Sustainability is Our Common Bond
Organizers: Sut Ahuja, sutahuja@atmc.net
Unknown contaminants are of great concern because they can get into our drinking water from a variety of sources, including wastewater that is not adequately treated. In the U.S., more than 1.5 million people can receive drinking water that is tainted with crude oil, diesel fuel, algal toxins, pharmaceuticals such as endocrine disruptors (EDC), and personal-care product residues. The universe of potential EDCs is ever expanding as new pesticides and pharmaceuticals constantly enter the marketplace. The monumental tasks of prioritizing the backlog of compounds to be assessed and the reduction of their release into the environment are essential. Drinking water quality is greatly affected by catastrophes such as spillage of chemicals like 4-methylcyclohexane methanol (MCHM), lead contamination via lead-containing pipelines, and elevated levels of benzene in drinking water following a major oil spill into the Yellowstone River. In addition, a multitude of micro-pollutants, for example, microplastics that are improperly controlled, waste

from various industries, microcystines, disinfection by-products, pharmaceutical and personal care product chemicals adversely affect the water quality. Many of these contaminants have the potential to cause serious health problems. Their occurrence, contamination levels, and control measures must be well-understood. Presentations will focus on these issues and steps that must be taken to sustain water quality.

Current Status of PFAS Degradation, Destruction, Isolation, Removal & Sensing Research

Organizers: Manoj Shukla, Manoj.K.Shukla@usace.army.mil
Manoj Kolel-Veetil, manoj.kolel-veetil@nrl.navy.mil
Nancy Kelley-Loughnane, nancy.kelley-loughnane.1@us.af.mil

Per-and polyfluoroalkyl substances (PFASs) have been widely used since their development in 1940s. These compounds are highly stable due to the presence of carbon-fluorine (C-F) bonds and therefore they are nicknamed as "forever chemicals". PFASs have been also used heavily in military within aqueous film forming foams (AFFF) for fire training and emergency response purposes. Due to their widespread use scores of sites through the USA are contaminated with PFASs. It is estimated that around 110 million Americans find PFAS contamination in their drinking water supplies. Exposure of PFASs including their short-chain cousins has been linked to several health-related issues such as cancer, elevated cholesterol, obesity etc. in humans. Various traditional techniques have been attempted to degrade and remove PFAS from contaminated media, but, real success is still elusive. Some of the traditional technologies such as the incineration of PFASs with other wastes have potential to produces the active greenhouse gases hexafluoroethane and tetrafluoromethane with long-lasting effects on ozone layer. This symposium will discuss recent research efforts from government agencies, industries and academic institutions, their success, failure and their limitations for the degradation, destruction, isolation, removal and detection of PFASs.

Honorary and Invited Symposia

water.acs.org

Wonyong Choi, wchoi@postech.edu**Ion Exchange, Sustainable Separations, & Humanitarian Engineering: A Symposium in Honor of Professor Arup K. SenGupta**

Organizers: Lee Blaney, blaney@umbc.edu
John Greenleaf, john.greenleaf@quinnipiac.edu
Arthur D. Kne, kneya@lafayette.edu
Sukalyan Sengupta, ssengupta@umassd.edu

The symposium will honor Professor Arup K. SenGupta from the Department of Civil and Environmental Engineering at Lehigh University. SenGupta is one of the world's foremost experts in environmental applications of ion-exchange processes, but he has also made significant contributions to understanding of Donnan-based processes, ligand exchange, and other environmental separation processes through his research, books, patents, and humanitarian work. His group is perhaps best known for their invention of hybrid ion-exchange nanotechnology (HIX-Nano) sorbents, which are ion-exchange resins with embedded metal oxide nanoparticles. This novel class of sorbents exhibits an extremely high affinity for many trace inorganic contaminants, including arsenic, fluoride, and phosphate, among others. The symposium will not only honor SenGupta's research contributions to water chemistry, water/wastewater treatment, and protection of water resources, but also celebrate his extension of that knowledge to safeguard the drinking water quality for people in poor communities around the world. For example, HIX-Nano routinely provides arsenic-safe drinking water to over two million people in Southeast Asia. The 2022 ACS Arup K. SenGupta Symposium will include invited and contributed oral and poster presentations on ion exchange, adsorption, membrane, Donnan equilibrium, and other related physicochemical processes for water/wastewater treatment and resource recovery.

Aquatic Photochemistry--Featuring a Special Session Honoring Dr. Silvio Canonica

Organizers: William Arnold, arnol032@umn.edu
Kristopher McNeill, kristopher.mcneill@env.ethz.ch
Garrett McKay, gmckay@tamu.edu
Jennifer Apell, japell@nyu.edu

Aquatic photochemical transformations are important in geochemistry and environmental chemistry in diverse contexts, such as 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 will provide important insight into the fate of chemical and biological species in the environment. In this symposium, we invite submissions that explore the direct and indirect roles of light in the photochemical transformation of natural and anthropogenic compounds, as well as interactions of light with organic matter, biomolecules, redox-active minerals, and microorganisms. ***In recognition of his retirement from the Swiss Federal Institute of Aquatic Science and Technology (EAWAG), we will be honoring Dr. Silvio Canonica, whose contributions are well-known by all environmental photochemists. We are happy that Silvio has agreed to give an invited talk as part of our symposium. We also welcome talks from Silvio's students and collaborators.

2021 ACS Award for Creative Advances in Environmental Chemistry

Organizers: Virender K. Sharma, vsharma@tamu.edu

[Invited Abstracts Only]

2022 James J. Morgan Early Career Award for Great Achievements in Environmental Science & Technology

Organizers: Maggie Mills, mmills@acs-i.org
Bryan Brooks, brooks@estlett.acs.org
Julie Zimmerman, julie.zimmerman@yale.edu
Shane Snyder, ssnyder@estwater.acs.org
Wonyong Choi, wchoi@postech.edu

[Invited Abstracts Only] Environmental Science & Technology, Environmental Science & Technology Letters, ACS ES&T Engineering and ACS ES&T Water are continuing their annual symposium series with this ENVR session highlighting the work of award-winning environmental science researchers. The invited speakers include journal editors, best paper award winners, and the winner of the 2022 James J. Morgan ES&T Early Career Award, which will be presented during the session.

2022 Outstanding Achievements in Environmental Science & Technology Award

Organizers: Maggie Mills, mmills@acs-i.org
Bryan Brooks, brooks@estlett.acs.org
Julie Zimmerman, julie.zimmerman@yale.edu
Shane Snyder, ssnyder@est

[Invited Abstracts Only] Environmental Science & Technology, Environmental Science & Technology Letters, ACS ES&T Engineering and ACS ES&T Water are continuing their annual symposium series with this ENVR session highlighting the work of award-winning environmental science researchers. The invited speakers include journal editors, best paper award winners, and the winner of the 2022 Outstanding Achievements in Environmental Science & Technology Award, which will be presented during the session.

Interdisciplinary Approaches to Environmental Challenges

Environmental Health & Toxicology

Organizers: Christie Sayes, christie_sayes@baylor.edu
Carsten Prasse, carsten.prasse@gmail.com

The environment and humans are exposed to tens of thousands of chemicals. Understanding how chemical exposures impact environmental and human health is critical for the development of mitigation strategies. There is a need to measure exposures and assess hazards of complex mixtures at the molecular and organism levels. The focus of this symposium is to present novel research designed to increase the understanding of how chemicals impact health.

Impact of COVID-19 on the Global Research Community & the Natural Environment

Organizers: Santosh K. Sar, santosh.sar@bitdurg.ac.in
Monika Swami, monika.swami@sal.edu.in

On a global scale, the Coronavirus pandemic (COVID-19) has a direct and indirect impact on human life and the natural environment. Since December 2019, this pandemic has altered study methods and working methods all around the world. In the environment, COVID-19 has affected water quality, atmospheric air, medical wastes, domestic wastes, soil quality, carbon emissions, food consumption, agricultural production, disinfectant use, protective kits, oxygen demand, and many more. Environmental researchers, scientists, and professors are now working on these topics in addition to their primary research subjects. This pandemic presents a significant disadvantage to humans and the natural environment, and yet it demonstrates the immense power of our global scientific community. This symposium will provide a platform for interrelated impacts of COVID-19 to be discussed with the goal of identifying new directions for research, increasing understanding of all concerns, and exploring solutions that affect human lives in relation to the environment.

Systems Approach for a Balanced Environmental System

Organizers: Julia Taylor, drjulia@taylorsuccesssystems.com
Art Villanueva, mrartv@yahoo.com

This Symposium will take a big picture perspective of environmental systems incorporating a multidisciplinary approach using Systems Thinking and Systems Engineering. The intention is to bring the system back into equilibrium through interventions that come about due to feedback loops. The emphasis is on efforts at remediation to correct for problems such as chemical contamination and other types of pollutants. It may involve taking advantage of environmental monitoring including new monitoring possibilities using sensors, which is made possible due to better cooperation of federal agencies It may also involve using new databases, such as the Comparative Toxicogenomics Database, and water, air, and disease data bases for local regions. Better use of data is now possible due to AI based software programs and data analytics methodology. New causal mechanisms can be identified as well as bioindicators that serve as early warning signals for disease. It is important to pay attention to the impacts of multiple stressors and their combined effects on the environment. The focus is on designing environmental systems that can be quickly brought back into balance when problems occur. It will emphasize research into all of the areas just mentioned and use of the most state of the art technologies available. This Symposium is for environmental innovators who design new technologies, researchers who contribute to environmental research, government leaders who focus on regulation and compliance, as well as non-profit organizations who create programs to enhance the environment.

Environmental Chemistry Analysis

Advances in Non-Targeted Analysis of Complex Samples

Organizers: Saer Samanipour, s.samanipour@uva.nl
Zhenyu Tian, tianzy@uw.edu
Sarit Kaserzon, k.sarit@uq.edu.au
Jake O'Brien, j.obrien2@uq.edu.au
Kevin Thomas, kevin.thomas@uq.edu.au

Recent advances in analytical instrumentation (i.e., GC/LC-HRMS) and data processing approaches have paved the path to the discovery of a growing number of chemicals of biological relevance in complex samples. However, the non-targeted analysis (NTA) experiments are extremely challenging to set up and may require specifically developed tools/approaches, depending on the initial hypothesis. This session will explore existing and new tools for dealing with complex samples. Experimental strategies will include novel HRMS acquisition methods as well as chromatographic approaches (e.g., LCxLC). Discussion of the data processing tools will cover the latest developments related to steps taken during NTA experiments, from feature detection to the identification of unknowns. This session will provide a forum for discussing the state of the arts in NTA and the needed future developments from the experimental setup to the digital approaches. In this symposium, developers (i.e., both experimental and digital) may present their research and application-oriented researchers will be able to discuss their future needs and desires for analytical instrumentation.

Accurate Mass/High Resolution Mass Spectrometry for Environmental Monitoring & Remediation Applications

Organizers: Tarun Anumol, tarun.anumol@agilent.com
Ruth Marfil-Vega, rmmarfilvega@shimadzu.com
Damia Barcelo, dbcqam@cid.csic.es

High-resolution accurate mass spectrometry (HRMS) is becoming increasingly popular in environmental research due to the ability to analyze environmental contaminants in an unbiased manner without any prior knowledge, while also offering the benefit of retrospective data-mining to look for chemicals. In its sixth year, this symposium will continue to focus on the use of HRMS as a tool to identify and prioritize many of the tens of thousands of chemicals released into the environment each day. These instruments allow the flexibility to perform a number of workflows, including screening of several hundred contaminants without the need for standards, identification of unknown compounds, and quantification of targets, all in one run. This session will focus on the use of high-resolution mass spectrometers and their application for analysis of organic contaminants in the environment. Associated issues include optimizing workflows using HRMS instruments, relevant quality assurance/quality control approaches, data processing and statistical evaluation of results, and others. Papers using HRMS for identification of organic compounds, screening of emerging contaminants and quantification of target analytes in water, air, dust, soil, sludge and other environmental matrices, and applied case studies are welcomed.

New Developments in Analytical Methods & Instrumentation for Environmental Science & Technology

Organizers: Susan Richardson, richardson.susan@sc.edu
Susana Kimura-Hara, s.kimurahara@ucalgary.ca
Greg LeFevre, gregory-lefevre@uiowa.edu

New analytical methods and instrumentation are key to quantifying trace-level environmental contaminants, discovering new contaminants, and understanding the fate of contaminants in the environment. This ES&T-sponsored symposium will showcase new analytical methods and instrumentation that enable improved extraction, separation, detection, identification, quantification, and the study of environmental contaminants in complex environmental matrices including water, air, soil, and biota. Target and non-target analytical approaches are encouraged, as well as new workflows, software, and

database development. New techniques and approaches to discovering novel environmental transformation products and metabolites are also encouraged. This symposium complements ENVR009- Accurate Mass/High Resolution Mass Spectrometry for Environmental Monitoring & Remediation Applications, but this symposium will showcase a broader range of analytical methods and instrumentation. Examples of new analytical methods and instrumentation can include (but are not limited to): Ion mobility and differential ion mobility spectrometry-mass spectrometry, new high resolution-MS approaches, ultraperformance convergence chromatography or supercritical fluid chromatography, new solid phase extraction and microextraction methods, new analytical methods for uncovering unknown per- and polyfluoroalkyl substances (e.g., AOF, EOF, PIGE, and 19F NMR), use of metal organic frameworks or other novel substances for extraction- New software/database development to aid in the identification of unknown contaminants, new techniques and approaches for discovering novel environmental transformation products and metabolites, novel methods that bridge analytical chemistry and exposure effects, and new electrochemical and spectroscopic methods.

Environmental Science at the Nanoscale

Micro & Nanoplastics in the Environment: Detection, Occurrence, Fate, & Toxicological Impact

Organizers: Souhail Al-Abed, al-abed.souhail@epa.gov
Phillip M. Potter, potter.phillip@epa.gov
Miranda J. Gallagher, mgallagher@jhu.edu

A 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 in the environment. There is a need for standardized methods that can be applied for sample collection, separation, detection, and characterization as well as a lack of sufficient research into the toxicological aspects of microplastic pollution. In addition, micro and nanoplastic standard reference materials, made by the user in a laboratory setting or purchased commercially, are needed to assess methodology and perform risk assessments. This symposium will feature studies that address knowledge gaps and expand on current experimental methods. Preferred topics include: 1) New methods for sampling, separation, and detection of microplastics; 2) Micro and nanoplastic formation under controlled conditions; and 3) Macro, micro, and nanoplastic remediation.

Agriculture & Food Systems Supported by Nanotechnology

Organizers: Christie Sayes, christie_sayes@baylor.edu
Evan Braswell, Evan.braswell@usda.gov

The use of nanotechnologies supporting agriculture and food systems is of growing interest. From targeted delivery of therapeutic agents combating disease to the heightened action of fertilizers or pesticides, nanotechnology offers unique opportunities to researchers, regulators, and growers, alike. This symposium will bring together scientists from diverse backgrounds to highlight recent advances and new methods for detecting and suppressing pests and pathogens while maximizing plant and animal health.

Innovative & Practical Approaches for Treatment of Per- and Polyfluoroalkyl Substances (PFASs) and Fluorinated Alternatives

Organizers: Jong Kwon Choe, jkchoe@snu.ac.kr
Yongju Choi, ychoi81@snu.ac.kr
Yujie Men, ymen@engr.ucr.edu
Yin Wang, wang292@uwm.edu
Jinxia Liu, jinxia.liu@mcgill.ca

Per- and polyfluoroalkyl substances (PFASs) are a large class of man-made chemicals that have been widely used in consumer products and in industrial and military applications. Their ubiquitous presence and persistent nature pose unique challenges to the environment and human health. Recently, fluorinated alternatives to existing PFAS compounds have been developed and used, but their fate and impacts on human and environmental health as well as remediation strategy are mostly unknown and need research. This symposium will address opportunities and challenges of developing effective and efficient treatment approaches to intercept or destroy− a wide range of PFASs and fluorinated alternatives in water and soil environment. Both original experimental and computational simulation investigations are welcome, especially for fluorinated alternatives. We encourage studies aiming at the following goals: (1) rapid and/or selective separation of PFASs and fluorinated alternatives from water matrix, (2) extensive or complete destruction of C−F bonds, (3) characterization of degradation products and elucidation of transformation mechanisms, and (4) treatment train for water/wastewater and/or soil containing other pollutants and inhibitors. Novel analytical methods that can facilitate the treatment of PFAS and fluorinated alternatives are also very welcome. Adequate time may be allocated to keynote topics.

Advanced (Nano)Materials, Membranes & Manufacturing for Water Treatment and Reuse

Organizers: Nirupam Aich, nirupama@buffalo.edu
Shudipto Dishari, sdishari2@unl.edu
Adeyemi Adeleye, adeleyea@uci.edu
Anwar Sadmani, sadmani@ucf.edu

Current research in water treatment and reuse has a great emphasis on several advanced processes. Advanced nanomaterials (e.g., single-atom catalysts, metal/covalent organic frameworks, multifunctional nanohybrids, and nanocomposites) are playing a critical role in such processes and opening new avenues to tackle emerging contaminant challenges. Advanced manufacturing enables energy-efficient and cost-effective scale-up of new technologies and sustainable products with improved functionalities, which aid in solving these challenges. This symposium will provide the environmental science and engineering community with opportunities to exchange knowledge and ideas about recent innovations and challenges associated with water treatment and reuse, such as (i) advanced manufacturing of new, nano-engineered membrane materials and processes to revolutionize desalination and industrial wastewater treatment; (ii) leveraging 3D printing to enable green technologies for a diverse array of environmental applications to control pollution. Topics of interest include: 1. Single-atom, nanocomposites, MOFs, COFs, 2D, and polymeric nanomaterials for water treatment. 2. Nanomaterials and catalysts for removal/treatment of pathogens and emerging contaminants. 3. Nanocomposite membranes for contaminant removal, desalination, separation, and distillation. 4. 3D printed materials, sensors, membranes, and architectures for water treatment. 5. Data-driven design of materials and processes for water treatment.

Microbiotechnology Tools for Wastewater Treatment & Organic Solids Reduction

Organizers: Mayur Kurade, mayurkurade@hanyang.ac.kr
Byong-Hun Jeon, bhjeon@hanyang.ac.kr
Mukesh Kumar Awasthi, mukesh_awasthi45@yahoo.com

The recent advancements in analytical chemistry have revealed that wastewater is far more complex than what we had imagined before, which carries numerous synthetic inorganic and emerging organic

compounds (ECs). The conventional biological processes are not efficient enough to eliminate these ECs. Therefore, the modification of existing biological treatment systems and/or addition of advanced technologies into WWTPs is an urgent need. Another problem of WWTP is the disposal of sludge which is usually treated through anaerobic digestion (AD). Recently, more efforts have been devoted to effectively utilize high-strength organic substrates in anaerobic co-digestion approach as it significantly enhances biogas production. This session aims to gather experts who can address the latest developments and applications of wastewater treatment technologies including biological removal of contaminants and biosolids reduction. We welcome the findings describing the fundamental mechanism of microbial degradation processes, new advancements in ECs removal and AD in WWTP, and their possible applications at pilot plant or real scale. Topics of interest include, but are not limited to, • Application of bioremediation, phycoremediation and phytoremediation for removal of ECs (i.e., PPCPs, pesticides, PCBs, synthetic fragrances, nanomaterials etc.) from wastewater. • Integrated biological approach and/or bioaugmentation processes for contaminant degradation. • Catalytic enzymes and novel degradation pathways in bioremediation. • Novel molecular-based techniques for wastewater microbiology, microbial communities, and functional genomics and proteomics to understand the microbial interactions. • Advancements in anaerobic digestion of biomass for higher yield in gaseous fuels. • Process inhibitors and challenges for biomass utilization in anaerobic digestion and the strategies to eliminate it.

Electrified Water Treatment Processes

Organizers: William Tarpeh, wtarpeh@stanford.edu
Hang Dong, lucasdhg@stanford.edu
Marta Hatzell, marta.hatzell@me.gatech.edu
Shihong Lin, shihong.lin@vanderbilt.edu
Xing Xie, xing.xie@ce.gatech.edu

Most existing water treatment processes rely on the periodic use of chemicals, such as coagulants, oxidants, and disinfectants. The transportation and storage of these chemicals can jeopardize the resilience of centralized water treatment and create intrinsic challenges for distributed water treatment. Recent attention has been drawn to process electrification to minimize chemical consumption. These electrified processes use electricity to drive separation processes (e.g., electrodialysis), provide direct redox power (e.g., electrochemical redox processes), or generate chemicals in situ (e.g., electrocoagulation, electrochemical acid/base production). Compared to chemical inputs, electricity is easier to deliver, can be generated locally, and can be produced using sustainable energy for remote applications. As energy cost decreases and treatment needs evolve (e.g., more stringent standards, zero-liquid discharge, resource recovery), previously cost-prohibitive electrified processes may become economically favorable. In the meantime, new high-performance and energy-efficient electrified treatment processes are emerging. Therefore, we invite abstract submissions on electrified water treatment processes. The relevant technical areas include, but are not limited to, electrocoagulation, electrochemical redox processes, electrodialysis, electrosorption and capacitive deionization, electrochemical or electrophysical water disinfection, electric-field assisted processes, and electrochemical resource recovery. Abstracts on techno-economic analysis (TEA) and life cycle assessment (LCA) of electrified water treatment processes are also welcome.

Biochemical Principles of Stormwater Treatment System Design

Organizers: Sanjay Mohanty, mohanty@ucla.edu
Timothy Dittrich, Timothy.Dittrich@wayne.edu

This symposium invites researchers working on the advancement of stormwater treatment system design based on the fundamental physical, chemical, and biological processes. Example research areas include, but are not limited to, the use of novel amendments, biological augmentation of filter media, hydraulic manipulation, and specific designs to remove emerging pollutants.

Atmospheric Chemistry

Atmospheric Aerosol Chemistry

Organizers: Marcelo Guzman, marcelo.guzman@uky.edu
Lynn Russell, lmrussell@ucsd.edu
William R. Stockwell, William.R.Stockwell@gmail.com

Atmospheric aerosols influence public health and the Earth's climate, yet many uncertainties persist in the fundamental chemical and physical processes that occur in atmospheric particles and on their surfaces. This symposium will bring together environmental scientists, chemists, physicists, and engineers to present the current progress in our understanding of aerosol multiphase processes from field measurements, laboratory studies, and computational modeling. Relevant abstracts across the field of atmospheric aerosol chemistry will be considered. For a more focused discussion on molecular-scale effects in organic/inorganic aerosol, see the Ion-Molecule Interactions in Environmental Aerosol Symposium.

Ion-Molecule Interactions in Environmental Aerosol

Organizers: James Davies, jfdavies@ucr.edu
Ryan Davis, rdavis5@trinity.edu
Amanda Frossard, afrossard@uga.edu
Douglas Collins, dbc007@bucknell.edu
Megan Willis, Megan.Willis@colostate.edu

Molecular interactions in multicomponent aerosol particles influence the physical, chemical and optical properties that govern their impacts in the environment. A large fraction of environmental aerosol are multicomponent mixtures of organic molecules and inorganic ions, formed by direct emission, such as respiratory aerosol or sea-spray, or indirectly, via gas-to-particle uptake of SO2 and NO2 on atmospheric aerosol. Ion-molecule interactions in these systems can enable unique properties and transformations that may have significant consequences in the environment. For example, in respiratory aerosol, salts, proteins and surfactants interact leading to phase transitions and physical characteristics that may influence the survival of viruses and bacteria. Lipopolysaccharides and other saccharide-based organic molecules have been shown to interact strongly with divalent ions, with implications for the phase state and chemical reactivity of sea-spray and marine aerosol. Complex phase transitions, such as liquid-liquid phase separations, have been identified in atmospheric aerosol mixtures that can influence the formation of clouds, particle reactivity and optical properties. Such phase transitions are often driven by the balance of attractive and repulsive forces between organic and inorganic components. This symposium welcomes abstracts discussing the formation of mixed organic/inorganic particles in the environment and the influence of ion-molecule interactions on the phase state and morphology, viscosity, surface tension and surface partitioning, hygroscopicity, CCN activity, optical properties, heterogeneous reactivity, and photoreactivity of environmental aerosol. We welcome reports of laboratory experiments using new and established analytical methods, modelling studies, field observations, and molecular simulation studies. For more general aerosol topics, please see the ENVR: Atmospheric Aerosol Chemistry symposium.

Addressing Sustainability Challenges

Perspectives on Climate Change Literacy & Education: Local to International

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

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.

Green Chemistry & the Environment
Organizers: Rafa Luque, q62alsor@uco.es
Sherine Obare, soobare@uncg.edu
Papers that focus on various aspects of green chemistry processes are invited to this symposium.

Advances in Geopolymers & Sustainable Environmental & Energy Applications
Organizers: Yusuf Adewuyi, adewuyi@ncat.edu
Monday Uchenna Okoronkwo, okoronkwom@mst.edu
Geopolymers are novel inorganic polymeric materials, which are widely synthesized from abundantly available aluminosilicate sources. This symposium invites contributions that advance the fundamentals on structure function relationships and rational design of novel geopolymeric materials (adsorbents & catalysts) for water and air depollution, and for energy production, conversion and storage.

Innovative Materials & Technologies for Environmental Sustainability
Organizers: Christie Sayes, christie_sayes@baylor.edu
H.N. Cheng, h.cheng@acs.org
Environmental sustainability can be defined as the study of rates related to renewable resource harvest, pollution creation, and non-renewable resource depletion. This is an area of intense focus for members of the ENVR Division of ACS, among others). The focus of this symposium is to present innovative materials and next generation technologies designed to improve sustainability in chemical processes into the next century.

Chemical, Physical and Biological Processes in the Environment

Advancing Phosphorus Chemistry for Sensing, Removing, and Recovering Phosphorus
Organizers: Douglas F. Call, dfcall@ncsu.edu
Brooke Mayer, brooke.mayer@marquette.edu
Eric McLamore, emclamo@clemson.edu
Treavor Boyer, thboyer@asu.edu
Phosphorus is an essential element to sustaining global food systems, but its use and management face many environmental challenges. Runoff from agricultural soil, animal waste, and urban storm water, for example, results in undesirable phosphorus losses to surface waters that can lead to eutrophication and harmful algal blooms. Once "lost" to the environment, phosphorus demand is met by mining new—but finite—sources of phosphate rock. Sustainable management of the phosphorus cycle requires new approaches to detect, quantify, remove, and recover phosphorus in a variety of environmental matrices. Key to these goals is a fundamental understanding of phosphorus chemistry. In this session, we welcome presentations focused on a range of topics related to phosphorus chemistry including, but not limited to: • Adsorption of phosphorus on materials or by enzymes; • Precipitation of phosphorus-containing solids; • Physical, chemical, and biological transformations of organic and other complex forms of phosphorus; • Characterization of organic phosphorus in complex matrices; • Separation of phosphorus (e.g., electrochemical, membranes, ion exchange); and • Detection/sensing of phosphorus.

Occurrence & Fate of Pesticides in Surface Waters
Organizers: Kevin Armbrust, armbrust@lsu.edu
Laura Basirico, lbasir1@lsu.edu
The use of pesticides is critical to agricultural production, providing a food supply to feed an ever-growing global population. However, use can result in movement offsite from the point of application and, ultimately, their presence in freshwater and marine ecosystems. These residues may result in ecological impacts to organisms in receiving waters if toxicological endpoints are exceeded as well as enforcement action if compounds are detected above regulatory thresholds. Many federal and state programs have been put in place to address this issue. This symposium will explore the latest research on pesticide occurrence and fate in aquatic ecosystems as well as recent regulatory approaches to address detections. Suggested

topics include, but are not limited to, the results of water monitoring programs, measurements of pesticides and pesticide metabolites in freshwater and marine environments, laboratory and/or field studies on pesticide transport and degradation processes in aquatic ecosystems, research on agronomic practices to minimize off-site transport, regulatory programs for pesticides in surface waters, novel analytical detection methods for pesticides and pesticide metabolites in water, and exposure modeling of pesticide movement to surface waters.

Chemistry of Oil in Aquatic Ecosystems

Organizers: Laura Basirico, lbasir1@lsu.edu
Kevin Armbrust, armbrust@lsu.edu

Both crude oil and petroleum-based fuels enter aquatic environments via a variety of pathways and at different scales. Oil spills in aquatic systems can be as small as a few barrels resulting from a temporary seep from a pipeline to a catastrophic release as a result of an oil rig explosion or loss of an oil tanker. Understanding the behavior of these oils in aquatic systems is critical to emergency response activities to mediate impacts following a disaster. To date, most analysis/fingerprinting methods for petroleum and predictive tools for oil behavior have been based on well-known crude oils and fuels (e.g. gasoline and diesel). However, there is now increasing use and transport of novel oils such as palm oil and other natural vegetable-based oils for use in fuels, as well as low-sulfur fuel oils (LSFO) and reformates that can exhibit unique behavior and properties. These fuels and oils can be a challenge for analytical detection as well as predicting environmental behavior for emergency response. This symposium will explore the latest research in the chemistry and environmental behavior of these novel fuels and oils as well as modern tools to predict their behavior in aquatic ecosystems. Suggested topics include but are not limited to detection methods and finger-printing techniques for novel fuels and oils, degradation and fate processes, measurements of physical and chemical properties of novel fuels and oils and predictive methods and models to estimate their fate in aquatic ecosystems.

General Environmental Chemistry

Advances in General Environmental Chemistry

Organizers: Slawo Lomnicki, slomni1@lsu.edu

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