



American Chemical Society

Division of Environmental Chemistry Call for Papers 256th National Meeting & Exposition Boston, MA – August 19-23, 2018

Abstract Submission Deadline: March 12, 2018

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 of the American Chemical Society at the 256th ACS National Meeting in Boston, MA August 19-23, 2018.

Abstract Submission Deadline: **March 12, 2018**. 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 on the ENVR website at: www.acsenvr.com.

Sincerely,

Jillian Goldfarb, Ph.D.

Jellian Joldfar

ENVR Fall Program Chair

John and Willie Leone Family Department of Energy and Mineral Engineering

The Pennsylvania State University

Email: jzg321@psu.edu

ACS Thematic Symposia: Nanoscience, Nanotechnology & Beyond

Advances in Carbon Nanomaterial Design and Applications for Environmental Sustainability

Organized by: Francois Perreault (Francois.perreault@asu.edu), Leanne Gilbertson (leanne.gilbertson@pitt.edu)

This symposium brings together chemists, biologists, materials scientists, and engineers to discuss progress towards the sustainable design of carbon nanomaterials and critical advances in next-generation environmental applications that they enable. This includes establishment of guidelines for sustainable use, novel synthesis and characterization, and advances in life-cycle understanding from the molecular to product level.

Environmental Nanometrology

Organized by: Boris Lau (borislau@umass.edu), Philip Larese-Casanova (phil@coe.neu.edu), Appala Raju Badireddy (raju.badireddy@uvm.edu), Adeyemi Adeleye (adeleye.adeyemi@epa.gov), David Goodwin (david.goodwin@nist.gov)

This symposium addresses the development of new analytical methods for nanomaterial detection and quantification in environmental matrices, and the application of new analytical methods for better mechanistic understandings of nanomaterial behavior in the environment. Detection needs will also be considered with respect to modeling of expected concentrations of released nanomaterials to the environment.

Fate of Nanomaterials in Consumer Products: Transformation and Transport in the Environment

Organized by: Phillip Potter (potter.phillip@epa.gov) and Souhail Al-Abed (al-abed.souhail@epa.gov) As more products containing nanomaterials enter the marketplace each year, understanding NMs' ability to reach the environment and the chemical changes they undergo is critical to prevent damage to human health and the ecosystem. Despite the ability to fully characterize a given nanomaterial, there is no accepted standard for nanomaterials in consumer products and therefore it is difficult to predict NMs' fate once they enter waste. This symposium features studies that use state-of-the-art techniques for characterizing nanomaterials in existing consumer products or in the environment and conducting trials that simulate end-of-life for these nanomaterials.

From Lab to Tap: Implications of Scaling up Nano-enabled Environmental Technologies

Organized by: Mariana Lanzarini-Lopes (mlopes2@asu.edu), Seth Pedersen (seth.s.pedersen@rice.edu), Ana C. Barrios (acbarrio@asu.edu), Kiril D. Hristovski (kiril.hristovski@asu.edu), Michael S. Wong (mswong@rice.edu)

The symposium will serve as a platform for dissemination and discussion of current advances, challenges, barriers and environmental implications of environmental nano-enabled technologies from the generation of research ideas to commercialization stages.

Nanobubbles: A Sustainable Solution for Water Treatment and Agricultural Applications

Organized by: Wen Zhang (wzhang81@njit.edu), Valentina Prigiobbe (vprigiob@stevens.edu)
Nano Bubbles (NBs) have unique physicochemical properties owing to their high surface areas and aqueous stability, with applications such as detergent-free cleaning processes, tertiary oil recovery, foam fractionation, mineral flotation, food processing, and intracellular drug delivery. This symposium brings together academic researchers and industrial experts to discuss opportunities in the development of novel and green nanobubble-based processes, technologies and products for environmental, agricultural and other industrial applications. Suggested topics include fundamental and applied research with focuses on the interfaces and chemistry of nanobubbles. Modeling and experimental studies on NBs are both of interested to the audience of this session.

Materials and Processes for Environmental & Energy Applications

Advanced Materials for Energy and the Environment: Design, Fabrication and Application

Organized by: Emily Ryan (ryanem@bu.edu), Leela Arava (larava@wayne.edu), Xi Ling (xiling@bu.edu)

This symposium focuses on the design, synthesis, fabrication, characterization and modeling of advanced materials for environmental and energy applications with emphasis in structured and hierarchical materials, functional materials, low-dimensional materials, computational design of material systems and multicomponent materials systems.

Advanced Oxidation Processes for Water Treatment and Reuse: Applications and Implications

Organized by: Daisuke Minakata (daidaiminakata@gmail.com), Emily Asenath-Smith (Emily.asenath-smith@usace.army.mil), Gianluca Li Puma (g.lipuma@lboro.ac.uk), Kevin O'Shea (osheak@fiu.edu), Weihua Song (wsong@fudan.edu.cn), Kyle Doudrick (kdoudric@nd.edu), Dionysios (Dion) Dionysiou (dionysious.d.dionysiou@uc.edu)

To support the need to remove small organic compounds and their byproducts from water, this symposium will analyze multiple aspects of advanced oxidation processes, including novel materials, degradation mechanisms and rates, by-product generation and toxicity, and overall efficiency of a variety of advanced oxidation processes. Topics of interest also include hydroxyl radicals, chlorine radicals,

sulfate radicals, catalytic chemical oxidation, removal of pathogens and emerging contaminants, nanotechnology based treatment, UV and visible light technology, and electrochemical technology.

Catalysis for Environmental and Energy Applications

Organized by: Aditya Savara (savaraa@ornl.gov), Alex Orlov (alexander.orlov@stonybrook.edu), Shen Zhao (szhao@southernresearch.org)

This symposium addresses new developments and ongoing research in the design and application of catalysts for environmental and energy applications. This symposium encourages cross-pollination of knowledge, with applications ranging from vehicle emissions to reducing indoor air pollution to mitigating water pollution to CO₂ conversion.

Cosponsored by: CATL

Electrical/electrochemical Technologies for Environmental Applications

Organized by: Dawei Wang (dwang7@vcu.edu), Yang Yang (yangyang@caltech.edu), Chaplin P. Brian (chaplin@uic.edu), Xing Xie (xing.xie@ce.gatech.edu)

This symposium will cover recent advances in electrical, electrochemical and photoelectrochemical processes for environmental applications including the removal of contaminants, desalination, inactivation of bacteria, and resource recovery during these processes.

Environmental Biofilm Engineering – Harnessing the Power of Biofilms for Contaminant Removal and Resource Recovery

Organized by: Bin Cao (bincao@ntu.edu.sg), Haluk Beyenal (beyenal@wsu.edu), Robert Nerenberg (nerenberg.1@nd.edu)

Recent progress in biofilm research has enabled a better understanding of biofilm bioprocesses, which could lead to the development of novel, improved biotechnologies to address important environmental issues. This symposium will focus on the understanding, development, and application of biofilm-mediated bioprocesses for contaminant removal and resource (including electrons) recovery.

Thermochemical and Biochemical Conversions of Biomass to Biofuels and Biomaterials for Energy & Environmental Applications

Organized by: Maurizio Volpe (maurizio.volpe@unitn.it), Ming Zhao (ming.zhao@tsinghua.edu.cn), Roberto Volpe (r.volpe@qmul.ac.uk), Michael Timko (mttimko@wpi.edu), Fanxin Li (fli5@ncsu.edu), Luca Fiori (luca.fiori@unitn.it), Pinjing He (13816750696@139.com), Guanyi Chen (chen@tju.edu.cn) This symposium will highlight advances in thermochemical and biochemical conversions of biomass, highlighting advances in process technology and up-scaling, catalysts for fuel upgrading, applications of biochars and hydrochars (activated carbons, electrodes, supercapacitors), and novel biomass-based products (biotemplated nanomaterials, quantum dots) from the integrated biorefinery.

Waste to Product: Biological and Physicochemical Resource Recovery and Efficiency

Organized by: William Tarpeh (wtarpeh@umich.edu), Nancy Love (nglove@umich.edu), Krista Wigginton (kwigg@umich.edu), Kara Nelson (karanelson@berkeley.edu), Kartik Chandran (kc2288@columbia.edu)

This symposium welcomes papers about novel approaches to extracting resources and/or treating contaminants to minimize risks of product dissemination, including resource recovery from wastewater, solid or gas feedstocks, and closing loops in inefficient processes while minimizing environmental impact, energy demand, and cost for sustainable resource management. It brings together researchers in biological and physicochemical processes to build a resource recovery community. *Cosponsored by: AGRO*

Chemistry of Struvite and Slow Release Fertilizers: From Fundamentals of Crystal Growth to Engineered Nutrient Recovery and their Release

Organized by: Jonas Baltrusaitis (job314@lehigh.edu)

This symposium will focus on all aspects of slow release fertilizer material, such as struvite and related low solubility major inorganic nutrient (N, P, K, Ca, Mg, S) containing compounds, synthesis and their utilization for improved nutrient recovery and reuse. It is intended for scientists and engineers that are exploring fundamental aspects of slow release fertilizer material growth and dissolution as well as environmental, chemical and agricultural engineers utilizing systems approach.

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Emerging Challenges in the Era of Drinking Water Insecurity and Inequality and the Search for Low-Cost Solutions

Organized by: Jerry Sarquis (sarquijl@miamioh.edu), Patrick Gordon (patrick.gordon65@gmail.com), Adrienne Katner (akatn1@lsuhsc.edu)

Safe water challenges, i.e., aging infrastructure, threats to potable freshwater sources, plumbing- and private-well contaminants, faced by minority, economically disadvantaged and deindustrialized communities, and communities burdened with legacy-contamination. Solutions such as nanophotonics and waste product reuse are presented, along with the social, political and economic barriers which must be overcome, and the need for the development of low-cost technologies.

Novel Treatment Approaches for Emerging Contaminants in Groundwater Systems

Organized by: Natalie Cápiro (natalie.capiro@tufts.edu), Mengyan Li (mengyan.li@njit.edu), Damian Helbling (deh262@cornell.edu)

This symposium will discuss novel physical, chemical, and biological approaches for treatment of emerging contaminants such as per- and polyfluoroalkyl substances, 1,4-dioxane, pesticides, and antibiotics in groundwater systems.

Cooperatively Cosponsored by: AGRO

Water Reuse and Recycling: Innovative Solutions for Treatment and Implementation

Organized by: Tingting Wu (twingting.wu@uah.edu), Yang Deng (dengy@mail.montclair.edu), Douglas Kriner (dougk@alum.mit.edu)

Water reuse is a sustainable solution to address increasing demands for clean water under the pressures of rapid population growth, fresh water shortages, climate change and impaired water sources. This symposium serves as a forum for recent research advancing treatment technologies (materials, processes, and monitoring) and implementation hurdles (policy, public opinion, economic) pertinent to water reuse applications. (Papers addressing Advanced Oxidation Processes should be submitted to: *Advanced Oxidation Processes for Water Treatment and Reuse: Applications and Implications*)

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Green Chemistry and Engineering

Green Chemistry and the Environment

Organized by: Sherine Obare (Sherine.obare@wmich.edu), Alina Balu (qo2balua@uco.es), Neelam Vaidya (neelamv@viridischem.com), Rafael Luque (q62alsor@uco.es)

Chemical processes that utilize 'green' principles are essential towards developing as well as ensuring a sustainable environment and future. This symposium will bring together scientists from the academic, industrial, and government sectors to discuss emerging green chemistry strategies in biotechnology, chemistry, chemical engineering, environmental engineering, and toxicology to explore green processes

for wastewater treatment, green synthesis and solvents, safe industrial practices, waste valorization, and alternative energy technologies.

Assessing, Mitigating, and Preventing Environmental Impacts of Chemicals & Technologies

Advances in Sensors and Biosensors for Environmental Monitoring

Organized by: Jason Berberich (berberj@miamioh.edu), Endalkachew Sahle-Demessie (sahledemessie.endalkachew@epa.gov), Tao Li (Li.Tao@epa.gov)

This symposium will explore advances in sensor and biosensor development for detection of priority and emerging organic, inorganic and biological contaminants in food, water, soil, and air. Contributions include but are not limited to: innovative sensor, and biosensor design, whole cell biosensors, nanomaterials for biosensing, sensor network design and real-time pathogen monitoring are encouraged.

Environmental Health and Safety of Emerging Chemicals and Technologies

Organized by: Xiaoping Pan (panx@ecu.edu), Yumin Li (Liyu@ecu.edu), Shouquan Huo (huos@ecu.edu), Baohong Zhang (zhangb@ecu.edu)

This symposium provides a platform to communicate research related to environmental health/safety impacts of emerging environmental substances such as pesticides including biopesticides (dsRNAs), oil and dispersants, pharmaceuticals and personal care products (PPCPs), food preservatives and additives, metals and metalloids, flame retardants, biotoxins, and those resulted from innovative agricultural or medicinal technology.

Cooperatively Cosponsored by: AGRO

Environmental Impacts of Electronic Technologies, Products, and Processes: The Search for Sustainable Electronics

Organized by: Endalkachew Sahle-Demessie (sahle-demessie.endalkachew@epa.gov), John Glaser (Glaser.john@epa.gov)

This symposium is designed to draw together research related to electronic sustainable materials. The convergence of different lines of research surrounding this topic offers the opportunity to develop the potentially rich cross-linking interests leading to new directions of inquiry. Contributions are expected to span reuse/recovery, recycling, end-of-life flow and cost modeling and new vistas for repurposing this body of materials.

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Environmental Obesogens: Exposure Pathways, Mechanism of Action and Trends

Organized by: Bommanna Loganathan (bloganathan@murraystate.edu), Govindan Malarvannan (gmalarvannan@gmail.com), Juliette Legler (j.legler@uu.nl), Kenneth Sajwan (sajwank@savannahstate.edu)

Human exposure to environmental pollutants has been attributed to the widespread prevalence and dramatic increase of obesity over the last four decades. More than 1.5 billion adults worldwide are overweight or obese and this number continue to increase steadily. This inaugural symposium deals with detection, characterization, human exposure pathways, mechanism of action of environmental obesogens and preventive measures to limit exposure to prevent obesity.

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Legacy and Emerging Per- and Polyfluoroalkyl Substances: Identification, Fate, Transport, Exposure, and Removal

Organized by: Feng (Frank) Xiao (Feng.Xiao@UND.edu), Kung-Hui (Bella) Chu (kchu@civil.tamu.edu), Jinxia Liu (jinxia.liu@mcgill.ca) Matt Simcik (msimcik@umn.edu)

This symposium will address the fate and transport, identification and removal, and non-occupational exposure and risk assessment of per- and polyfluoroalkyl substances (PFOS; PFOA; PFASs), emerging persistent organic contaminants.

Microplastic Pollution: Sources, Sinks, and Solutions

Organized by: Nicole Fahrenfeld (nfahrenf@rutgers.edu), Shannon Bartelt-Hunt (sbartelt2@unl.edu) Microplastics are emerging contaminants in the environment. The problem was highlighted by the addition of microbeads to personal care products resulting in phase-outs by industry and legislative bans. In the years since, secondary microplastics including those originating as improperly disposed of plastic trash and microfibers are gaining attention. The purpose of the symposium to define the state of the science.

Novel Developments in Containment Monitoring in Water Sources

Organized by: Steven Lingenfelter (sclingen28@gmail.com), Christopher Steary (Christopher.Steary@glwater.org), Ashifali Saiyad (Ashifali.Saiyad@glwater.org), Benoy Elias (Benoy.Elias@glwater.org)

The symposium will focus on developments in containment monitoring such as heavy metal, organics etc that can be found in water sources. The intended audience is those with an interested in analytical chemistry applied to the environment and environmental regulations.

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Wastewater-Based Epidemiology – Opportunities and Challenges

Organized by: Bikram Subedi (bsubedi@murraystate.edu), Daniel A. Burgard (dburgard@pugetsound.edu), Bommanna Loganathan (bloganathan@murraystate.edu)
Wastewater-based epidemiology (WBE) utilizes analyte concentration, population served by the treatment facility, and inflow levels to estimate the semi-real-time community use of, or exposure to, contaminants. Several opportunities and analytical challenges associated with WBE include use and environmental fate of illicit drugs, flame retardants, plasticizers, and their impacts on environmental health.

Chemical, Physical and Biological Processes in the Environment

Chemical Reactions at Solid-Water Interfaces of the Natural and Built Environment

Organized by: C. P. Huang (huang@udel.edu), Ruey An Doong (radoong@mx.nthu.edu.tw), Hyunook Kim (H_kim@uos.ac.kr), Bingcai Pan (bcpan@nju.edu.cn), Virender K. Sharma (vsharma@sph.tamhsc.edu)

Chemical reactions at the solid-water interfaces have great implications in both the natural and built environment. This symposium invites researchers from a broad field of science and technology such as geochemistry, colloid and interface, and catalysis to share their experiences and results on the observation of interfacial chemical reactions such as proton transfer, electron transfer and coordination. (Papers addressing sorbent surfaces can be submitted to *Physicochemical and Biological Phenomena on Sorbent Surfaces in Environmental Applications*)

Legacy and Emerging Organic Contaminants in the Great Lakes, Seas and Oceans

Organized by: Yuxin Ma (xinxin0709@126.com), Rainer Lohmann (rlohmann@uri.edu)
Recent advances in biogeochemical processes affecting the fate, transport and food-web bioaccumulation of legacy and emerging organic contaminants in the Great Lakes, seas and oceans will be discussed in this

session. Method development for field sampling and quantitative analysis, model evolution, as well as ecological effects and risk assessment of these chemicals in aquatic ecosystem will be included.

Physicochemical and Biological Phenomena on Sorbent Surfaces in Environmental Applications

Organized by: Yongju Choi (ychoi81@snu.ac.kr), Jong Kwon Choe (jkchoe@snu.ac.kr), David Werner (david.werner@ncl.ac.uk), Sungjun Bae (bsj1003@konkuk.ac.kr)

This symposium centers on recent advances concerning the underlying physicochemical and biological phenomena in sorption-based technologies for various environmental applications (e.g., air, water and wastewater treatment, soil and groundwater remediation). Papers that focus on developing novel and tailored sorbents, exploring unique phenomena on the sorbent surface, and combining sorption with chemical and biological reactions are especially welcomed.

Engaging the Future through Interdisciplinary Discussions and Education

Citizen Science and Chemistry

Organized by: William Batschelet (Batschelet.william@epa.gov), Sherine Obare (sherine.obare@wmich.edu), Elke Schoffers (elke.schoffers@wmich.edu)

Citizen science (broadly defined as public participation in the scientific process) is not new. However, with new and improved sensor technologies, mobile device apps, and information sharing via the internet, citizen science is moving into areas never before considered. Papers covering all aspects of chemistry-related citizen science projects are invited.

Honorary and Invited Symposia

C. Ellen Gonter Environmental Chemistry Awards

Organized by: Todd Anderson (todd.anderson@ttu.edu)

This award is presented to graduate students at U.S. and international universities who submit the highest quality research papers. The format to be followed is that of Environmental Science and Technology, except that the paper should be limited to 15 pages total, including figures and references. Award winners are expected to present their papers at the Fall American Chemical Society Meeting, where they receive a \$1,000 cash award at the Environmental Division Reception. The deadline for submission of a single pdf file via email to *todd.anderson@ttu.edu* is January 8th. These awards represent the highest honor granted by the Division of Environmental Chemistry for students.

Environmental Behaviors and Health Effects of Pollutants: A Symposium in Honor of Professor Guibin Jiang

Organized by: Virender K. Sharma (vsharma@sph.tamhsc.edu), Bing Yan (drbingyan@yahoo.com), Jingfu Liu (jfliu@rcees.ac.cn), Wei Chen (chenwei@nankai.edu.cn), Dionysios D. Dionysiou (dionysios.d.dionysiou@uc.edu)

The symposium will honor Professor Guibin Jiang, Chinese Academy of Sciences, who is a recognized global leader of environmental research and whose research has made significant contributions to environmental science not only in China, but all over the world. Topics covered include, but are not limited to: environmental analytical chemistry, environmental processes and effects of pollutants, environmental remediation and control, health effects of environmental pollutants, and ecotoxicology and environmental safety. *Please note: Oral Presentations by Invitation Only. This symposium is supported by the Chinese Academy of Sciences*.

Showcasing Emerging Investigators: A Symposium by the RSC Environmental Science Journals

Organized by: Sam Keltie (kelties@rsc.org), David Cwiertny (david-cwiertny@uiowa.edu), Kristopher McNeill (kris.mcneill@env.ethz.ch), Peter Vikesland (pvikes@vt.edu)

This invitation-only symposium will feature Emerging Investigators selected by the Editors of the RSC journals: Environmental Science: Nano, Environmental Science: Processes & Impacts and Environmental Science: Water Research & Technology. The papers presented highlight some of the high-quality, cutting-edge research being done by up-and-coming scientists in the field and published in these leading journals. *Please note: Presentations by Invitation Only*

ENVR Poster Session

Division of Environmental Chemistry General Poster Session

Organized by: Jillian Goldfarb (jzg321@psu.edu)

Abstracts in all areas of Environmental Chemistry and Engineering are welcome in the Division's Poster Session. This is an interactive session design to encourage dialogue among scientists while sharing highlights of new research. *Please note: as we cannot guarantee neighboring poster locations, only one poster per presenter is allowed in the ENVR Poster Session.*

ENVR Cosponsored Symposia

*cooperative co-sponsorship

Agriculture and Food Chemistry (AGRO)

Analytical Methods for Pesticide Residues in Pollinator Studies: Beyond Neonicotinoids

Organized by: Thomas Moate (tmoate@gplabs), Chris Bianca (chris.bianca@jrfamerica.com)

Assessing Risk, Providing Benefit: Making Informed Decisions in Endangered Species Pesticide Risk Management

Organized by: Bernalyn McGaughey (bmcgaughey@complianceservices.com), Michael Dobbs (michael.dobbs@bayer.com), Dan Campbell (Dan.Campbell@Syngenta.com), Leslie Honey (Leslie Honey@NatureServe.org), Melissa Martin, Cathy Tortorici, Patrice Ashfield

Challenges of Utilizing Higher-Tier Data in Risk Assessment & Risk Management of Pesticides*

Organized by: Steve Levine (steven.l.levine@monsanto.com), Laura McConnell (laura.mcconnell@bayer.com), George Cobb (George Cobb@baylor.edu)

EARLY CAREER: Environmental Study Design: Current and Emerging Guidelines

Organized by: Harika Adusumilli (hadusumilli@dow.com), Amanda Chen, Qi Yao

Early Phase Environmental Fate and Metabolism Studies

Organized by: Xiao Zhou (xzhou5@dow.com), Kari Lynn, Minli Zhang

Fate & Transport & Modeling of Pesticides in the Atmosphere

Organized by: Pat Havens (pahavens@dow.com), Shanique Grant (shanique.grant@syngenta.com)

How Can Advances in Chemistry Improve Human Health Exposure Assessment?

Organized by: Claire Terry (cterry@dow.com), Paul Price (Price.pauls@epa.gov)

New Technologies for Pesticide Analysis

Organized by: Wen Su (wen.su@monsanto.com), Manasi Saha (MANASI.SAHA@BASF.COM)

Pesticides in the News - What You Need to Know

Organized by: Aimee Hood (aimee.hood@monsanto.com), Genevieve O'Sullivan (gosullivan@croplifeamerica.org)

Pesticide Spray Drift: Application, Evaluation and Mitigation

Organized by: Jeff Perine (jeff.perine@syngenta.com), Harold Thistle (hthistle@fs.fed.us)

Reducing Uncertainty in Modeling the Environmental and Human Health Exposure to Agrochemicals *Organized by:* Amy Ritter (rittera@waterborne-env.com)

Risk Assessment, Management, and Communication Internally and for the Public (lost in translation)

Organized by: Natalia Peranginangin (natalia.peranginangin@syngenta.com), Marty Williams (williamsm@waterborne-env.com), Nelson Thurman (thurman.nelson@epa.gov)

The Role of Monitoring Data in Advancing Regulatory Risk Assessment

Organized by: Daniel Perkins (perkinsd@waterborne-env.com), Les Carver (carverl@waterborne-env.com)

Surfactant and Colloid Science as Applied to Agrochemical Formulations*

Organized by: Ricardo Acosta Amado (racostaamado@dow.com), Kimberly Hodge-Bell (kimberly.c.hodge-bell@monsanto.com), Matt Meredith (matt_meredith@huntsman.com), Solito Sumulong (Solito.Sumulong@cpsagu.com), Ryan Totten (rtotten@stepan.com)

Uses of LC-Mass Spectrometry in Support of Agricultural Research and Development—New Trends and Best Practices

Organized by: Jesse Balcer (jlbalcer@dow.com), James Ferguson (jferguson@smithers.com)