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**2017 Geochemistry Division Medal Symposium**

**Medal Presentation and Invited Lectures**

253<sup>rd</sup> American Chemical Society National Meeting & Exposition

San Francisco, California, April 2-6, 2017

Every two years, the Geochemistry Division recognizes an individual for his or her contributions to the field of geochemistry. The 2017 Geochemistry Division Medal will be awarded to Dr. Susan Brantley, Distinguished Professor of Geosciences at The Pennsylvania State University and member of the National Academy of Sciences, for her outstanding scientific accomplishments and impact in the fields of geochemistry and Earth surface processes, leadership, mentorship of students and junior scientists, and service to the geochemistry community. Her highly influential work on the kinetics of mineral-fluid interactions and weathering rates of natural systems, for example, has truly and profoundly changed our understanding of geochemical systems. After presentation of the medal, Dr. Brantley's contributions will be celebrated with a series of invited lectures.

General information about the conference can be found at [www.acs.org/meetings](http://www.acs.org/meetings). Any other inquiries should be directed to the symposium organizers:

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**CALL FOR PAPERS**

**Symposium in Honor of Dr. Susan Brantley**

**2017 Geochemistry Medal Recipient**

253<sup>rd</sup> American Chemical Society National Meeting & Exposition

San Francisco, California, April 2-6, 2017

Dr. Susan Brantley has been a pioneering and leading scientist in geochemistry for the past thirty years. Within this symposium, we will honor Dr. Brantley's impact on the fields of geochemistry and Earth surface processes by highlighting contributions with ties to Dr. Brantley's major research areas including, but not limited to, the kinetics of mineral-fluid interactions, weathering rates of natural systems, and linking laboratory-measured rates to field observations. This symposium is open to all to contribute and will also feature researchers who have worked with Dr. Brantley or who have been inspired and influenced by her work.

Please submit your abstracts using the ACS Meeting Abstracts Programming System (MAPS) at <https://maps.acs.org>. General information about the conference can be found at [www.acs.org/meetings](http://www.acs.org/meetings). Any other inquiries should be directed to the symposium organizers:

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CALL FOR PAPERS

**Mineral - Water Interface Chemistry I —  
A Tribute to Glenn Waychunas**

253<sup>rd</sup> American Chemical Society National Meeting & Exposition

San Francisco, California, April 2-6, 2017

*Co-sponsored by Division of Colloid and Surface Chemistry, and Division of Environmental Chemistry*

**Abstract submission deadline: October 31<sup>st</sup>, 2016**

Molecular processes at the mineral–water interface are critical components of all basic biogeochemical cycles, and control nanophase and surface chemical reactivity. Interfacial reactions control the rates of mineral growth and dissolution, nanoparticulate energetics and stability, and sorption and incorporation of nutrients and contaminants. Over several decades, the field of interfacial geochemistry has developed and applied progressively more powerful experimental approaches to establish the structure, stability and reactivity of mineral–water interfaces and the distribution and chemistry of solutes and sorbates in the special molecular environment of the electrical double layer. Spectroscopic, scattering and imaging methods have brought ever-increasing sensitivity to molecular speciation, higher spatial resolution (in some cases sub-Ångstrom), and recently the ability to access chemical dynamics on picosecond timescales.

Throughout this period of dramatic growth and discovery, Dr. Glenn Waychunas has been at the forefront of the field in conceiving and performing groundbreaking experimental studies of molecular interfacial systems and processes. His significant accomplishments include pioneering studies of sorbate geometry, interfacial water hydrogen bonding structure, nanophase structure and stability, and oxide surface terminations through novel applications of X-ray diffraction, absorption, and non-linear vibrational spectroscopy. This session will honor his career achievements and impacts on this field through submissions that reflect the broad and exciting scope of modern experimental interfacial geochemistry.

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CALL FOR PAPERS

**Mineral - Water Interface Chemistry II — General Session**

253<sup>rd</sup> American Chemical Society National Meeting & Exposition

San Francisco, California, April 2-6, 2017

*Co-sponsored by Division of Colloid and Surface Chemistry, and Division of Environmental Chemistry*

**Abstract submission deadline: October 31<sup>st</sup>, 2016**

The mineral-water interface is a primary site for many geochemical processes. Understanding these processes requires characterization of interfacial reactions at the molecular-scale. This session will highlight the diverse range of experimental and computational studies probing the mineral-water interface.

The topics that would be covered in this session are, but are not limited to:

- Structure, dynamics, and reactivity of mineral surfaces
- Ion adsorption/desorption thermodynamics, kinetics, and mechanisms
- Mineral growth/dissolution
- Surface mediated redox reactions
- Recent advances in computational and experimental design in interfacial chemistry
- Effect of confinement on mineral-water interfaces

We welcome molecular level fundamental studies on interfacial chemistry, particularly those which highlight recent advances in computational and experimental design development.

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CALL FOR PAPERS

## Structure, properties and applications of minerals with layered structure

253<sup>rd</sup> American Chemical Society National Meeting & Exposition

San Francisco, California, April 2-6, 2017

**Abstract submission deadline: October 31<sup>st</sup>, 2016**

Several minerals phases in the nature crystallizes with layered structure which includes clays, birnessites, layered double hydroxides, silicates, graphite, phosphates, manganates, titanates and several other oxides. These phases are characterized by anisotropic bonding and exhibit several interesting properties. They have been used for wide variety of applications since ancient days and now in the modern era as well which ranges from targeted drug delivery to battery materials. This symposium focusses on highlighting the recent developments in the area of layered mineral phases, both in terms of experimental studies and modelling.

The topics that would be covered in this session are, but are not limited to:

- Structural aspects of layered mineral phases
- Interaction/adsorption of small molecules including water, carbon dioxide and other organics at the surfaces and sub-surfaces
- Polytypism and stacking faults
- Use as sorbents for toxic gases and for immobilizing contaminants
- Role of clay minerals in origin of life
- Hydration-dehydration and exfoliation

We invite contributions addressing any of the topics above.

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**CALL FOR PAPERS**

**Redox-driven environmental geochemical reactions for metals, major elements and organic pollutants**

253<sup>rd</sup> American Chemical Society National Meeting & Exposition

San Francisco, California, April 2-6, 2017

**Abstract submission deadline: Oct 31<sup>st</sup>, 2016**

Reduction-oxidation reactions play an important role in regulating the geochemical cycles of metals, such as Fe, Mn, Hg, As, and many others. Various secondary mineral formation and speciation transformation occur, when metals are subject to the change in oxidation state. Recent evidence also showed that these redox reactions are important for the biogeochemical cycles of major elements, C, N and P. Organic pollutants are also degraded or transformed during the redox reactions. We call this symposium to highlight recent advancement in the environmental geochemical redox reactions, with implications for the fate and transport of metals, biogeochemical cycles of C/N/P and degradation of organic pollutants.

The topics that would be covered in this session are, but are not limited to:

- Spectroscopic studies on the speciation transformation of metals during redox reaction
- Thermodynamics and kinetic studies for metal reduction
- C transformation during the redox reactions of Fe
- Linkage between the redox reactions of metals and cycle of C/N/P
- Reductive degradation of organic pollutants

Please submit your abstracts using the ACS Meeting Abstracts Programming System (MAPS) at <https://maps.acs.org>. General information about the conference can be found at [www.acs.org/meetings](http://www.acs.org/meetings). Any other inquiries should be directed to the symposium organizers:

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**CALL FOR PAPERS**

**Formation, Structure, and Reactivity of Biogenic Minerals**

253<sup>rd</sup> American Chemical Society National Meeting & Exposition

San Francisco, California, April 2-6, 2017

**Abstract submission deadline: October 31<sup>st</sup>, 2016**

Biominerals are increasingly recognized as key drivers of biogeochemical processes. Furthermore, because of the passive nature of biomineral synthesis and the unique properties of many biominerals, they are of interest for technological applications. This symposium seeks to explore the formation, structure, and reactivity of biominerals in natural and engineered environments. Topics of interest include (but are not limited to) mechanisms of formation of, sorption of solutes to, and, redox properties of biominerals, as well as the dynamics of biomineralizing microbial communities, and application of biominerals in environmental remediation, water treatment, and energy-related technologies.

Please submit your abstracts using the ACS Meeting Abstracts Programming System (MAPS) at <https://maps.acs.org>. General information about the conference can be found at [www.acs.org/meetings](http://www.acs.org/meetings). Any other inquiries should be directed to the symposium organizers:

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**CALL FOR PAPERS**

**Environmental challenges and solutions in unconventional oil and gas development**

253<sup>rd</sup> American Chemical Society National Meeting & Exposition

San Francisco, California, April 2-6, 2017

*Co-sponsored by the Environmental Chemistry Division*

**Abstract submission deadline October 31<sup>st</sup>, 2016**

In the past decade, the use of combined horizontal drilling and hydraulic fracturing to recover hydrocarbons from low permeability reservoirs has revolutionized the worldwide energy scene. Fluids in the hydraulic fracturing water cycle often have complex inorganic and organic chemistry, microbiology, and toxicological profiles, which present analytical challenges for their characterization. However, a comprehensive understanding of these parameters is critical to: informing wellpad water disposal, reuse, and recycling strategies, identifying causes of infrastructure biofouling and biocorrosion, assessing the reuse of treated flowback for alternative uses such as crop irrigation, and for the development of appropriate risk assessment protocols for the handling of hydraulic fracturing fluid and wastewaters, such as flowback and produced water. Air emissions and fugitive methane leaks from unconventional wellpads have also raised environmental and human health concerns. In this session, we invite presentations that give new insights into the environmental impacts of unconventional oil and gas development, and potential solutions to those issues. Abstracts are invited on the geochemistry, microbiology, and toxicity of fluids in the hydraulic fracturing water cycle, including links to the target geologic formations, as well as on air quality concerns.

Please submit your abstracts using the ACS Meeting Abstracts Programming System (MAPS) at <https://maps.acs.org>. General information about the conference can be found at [www.acs.org/meetings](http://www.acs.org/meetings). Any other inquiries should be directed to the symposium organizers:

Shannon L. Flynn<sup>1</sup>, Daniel S. Alessi<sup>1</sup>, Jens Blotevogel<sup>2</sup>, Thomas Borch<sup>3</sup>

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CALL FOR PAPERS

**Contaminant transport, uptake, and remediation at contaminated sites**

253<sup>rd</sup> American Chemical Society National Meeting & Exposition

San Francisco, California, April 2-6, 2017

*Co-sponsored by Division of Environmental Chemistry*

**Abstract submission deadline: Oct 31<sup>st</sup>, 2016**

Contaminants in the environment are affected by complex biological, geological and chemical processes that have implications for both remediation effectiveness and exposure risk to humans. By understanding the mechanisms of these complex interactions, we are better equipped to optimize remediation strategies and therefore, improve science-based decision making for site management, priority-setting, and remedy selection. This session covers various aspects of speciation, transformation, complexation, mineralization, adsorption/desorption and transport of metals/minerals in environment, and their interactions with organic contaminants. The aim of this session is to collect the experimental, modeling and remedial contributions to understand the complex biogeochemistry for the assessment of environmental risks posed by transformations and transport of pollutants to the natural systems, although we do not put a limit only to natural environment. We invite contributions addressing the knowledge of biogeochemical interactions and advanced treatment approaches for contaminated ecosystems. **Topics of interest include, but are not limited to** (a) Understanding biogeochemical interactions of organic contaminants in environment; (b) Biogeochemical interactions occurring at the solid-water interface; (c) Biogeochemical approaches for decontamination of metals and organic contaminants at the contaminated sites; (d) Advanced remedial approaches such as utilization of biochar in contaminant management in the environment, and their mechanisms of interactions.

The topics that would be covered in this session are, but are not limited to:

- Biogeochemical interactions of organic contaminants in natural environment
- Biogeochemical interactions occurring at the solid-water interface
- Interactions of biogeochemically important elements/contaminants (C, N, Fe, Mn, Hg, U, As and S)
- Decontamination of metals and organic contaminants at the contaminated sites
- Advanced remedial approaches in contaminant management, and their interactive mechanisms.

**Confirmed invited speakers:** **Wooyong Um**, Pacific Northwest National Laboratory (PNNL), USA; **Jorg Rinklebe**, University of Wuppertal, Germany; **Dan Alessi**, University of Alberta, Canada;

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CALL FOR PAPERS

**Microbially-Driven Geochemical Reactions: Kinetics and Communities**

253<sup>rd</sup> American Chemical Society National Meeting & Exposition

San Francisco, California, April 2-6, 2017

**Abstract submission deadline: Oct 31<sup>st</sup>, 2016**

There may be as many as 10 billion times more microbial cells on Earth than stars in the Universe, and these microorganisms have astounding impacts on the geochemical processes that shape our planet's surface. Microbes catalyze crucial reactions involved in global elemental cycles and ecosystem health, and promote processes that facilitate the bioremediation of contaminated soil and water. In this session, we will explore the diversity of ways that microorganisms control the rates, pathways, and products of chemical transformations in the environment. We invite submissions that promote discoveries at the intersection of microbial community ecology and biogeochemistry. We seek submissions that focus on both natural and engineered systems, in freshwater, marine, and terrestrial settings. Topics of interest will be broadly organized around key elemental cycles, especially those that focus on the geomicrobiology of carbon, nitrogen, silica, phosphorus, sulfur, and metals including manganese and iron.

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**Bradley Tebo**, Institute of Environmental Health-Division of Environmental and Biomolecular Systems, Oregon Health & Science University, Portland, OR, USA [tebob@ohsu.edu](mailto:tebob@ohsu.edu)

CALL FOR PAPERS

**Advances in treatment processes for metals and metalloids**

253<sup>rd</sup> American Chemical Society National Meeting & Exposition

San Francisco, California, April 2-6, 2017

*Co-sponsored by Division of Environmental Chemistry*

**Abstract submission deadline: October 31<sup>st</sup>, 2016**

This session will focus on technologies for *in situ* and *ex situ* remediation of metals and metalloids in surface water and ground water, including waters impacted by mining and metal processing. The recent accidental release at the Gold King Mine in Colorado has highlighted the need for advancement in remediation of metal and metalloid contamination in remote areas where novel technologies may be more effective and safe. This session will feature advances in the processes that enable *in situ* and/or passive treatment systems to successfully immobilize metals and metalloids. Fundamental scientific laboratory investigations, pilot studies, and full-scale treatment studies are welcome; preference will be given to recent studies that identify active treatment mechanisms (chemical, biological, physical, and some combination thereof) for metals immobilization and lessons learned for full-scale design and implementation.

The topics that would be covered in this session are, but are not limited to:

- Enhanced *in situ* bioremediation
- *In situ* stabilization
- Passive *ex situ* bioreactors
- Novel remediation techniques

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**CALL FOR PAPERS**

**Mineral nucleation: transient intermediates and phase transitions**

253<sup>rd</sup> American Chemical Society National Meeting & Exposition

San Francisco, California, April 2-6, 2017

**Abstract submission deadline: October 31<sup>st</sup>, 2016**

The process of nucleation and growth of mineral systems in natural and synthetic systems is crucial for understanding, predicting, and controlling crystallization. Complex nucleation pathways which do not conform to classical monomer by monomer nucleation and growth have been known for some time. As experimental and computational methods continue to improve, the quality and quantity of observations and theories shedding light on complex pathways has increased steadily, especially in the past decade. A variety of nucleation pathways involving dense liquid phases, prenucleation clusters, amorphous intermediates, and crystallization by particle attachment have emerged. We invite experimental and computational contributions that present novel structures, dynamics, or mechanisms of nucleation and phase transition, as well as efforts to develop the theoretical frameworks that are needed to describe these phenomena.

The topics that would be covered in this session are, but are not limited to:

- Nucleation and growth by classical and non-classical mechanisms
- Nucleation in natural and synthetic systems
- Mineral transformations
- Heterogeneous and homogeneous nucleation pathways
- Biomineralization

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**CALL FOR PAPERS**

**Evolving nanoparticle reactivity throughout nucleation, growth, and dissolution**

253<sup>rd</sup> American Chemical Society National Meeting & Exposition

San Francisco, California, April 2-6, 2017

*Co-sponsored by Division of Environmental Chemistry, Division of Colloid and Surface Chemistry, and Division of Nuclear Chemistry and Technology*

**Abstract submission deadline: October 31<sup>st</sup>, 2016**

Nanoparticle reactivity is an important area of research for fields ranging from geochemistry to nuclear materials processing, and these reactions must be understood as dynamic or evolving processes. Reactivity is often highly sensitive to factors such as particle morphology, number of accessible reaction sites, and local solution conditions. Many reactions (e.g., reductive dissolution, exposure to radiation) result in changes to one or more of these factors. Nanoparticle nucleation at solution/solution interfaces and the subsequent reactions at the solid/solution interface is an extreme example of evolving reactivity that occurs both in geochemical systems and under materials processing conditions. Understanding the evolution of nanoparticle reactivity with changing conditions is a fundamental step in developing a comprehensive picture of the role of nanoparticles in environmental and industrial settings.

The topics that would be covered in this session are, but are not limited to:

- Nanoparticle reactivity
- Nucleation and growth
- Surface interactions
- Materials processing conditions
- Interfacial chemistry
- Nanoparticle dissolution
- Effects of doping on reactivity
- Environmental conditions

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**CALL FOR PAPERS**

**Pore-scale geochemical processes and the implications to CO<sub>2</sub> geologic storage**

253<sup>rd</sup> American Chemical Society National Meeting & Exposition

San Francisco, California, April 2-6, 2017

**Abstract submission deadline: October 31<sup>st</sup>, 2016**

Injection of CO<sub>2</sub> into deep subsurface formations, where it can be stored permanently via mineral trapping; drives geochemical reactions that can potentially alter the properties of the host rock. Geochemical processes that take place at nano- and micro-scales are fundamental to the understanding of how these changes translate to the field scale. The structure and mineral composition of geo-materials at the pore scale affect the hydrological accessibility of reactive phases and the bulk mineral-fluid reactivity within the porous media. Geochemical reactions within single pores including nucleation and crystal growth determine the potential for mineral trapping and the integrity of the caprock.

In this session, we aim to capture recent progresses in investigations of the pore-scale geochemical processes associated with CO<sub>2</sub> geological storage.

The topics that would be covered in this session are, but are not limited to:

- fine-scale characterization of mineralogy, pore structures and fracture surfaces, particularly of heterogeneous rock samples
- improved theoretical understanding and coefficient estimates of thermodynamics and kinetics of relevant geochemical reactions, particularly of clay minerals and scCO<sub>2</sub> or CO<sub>2</sub>-acidified fluids
- incorporation of pore-scale processes into Darcy-continuum and field scale studies
- coupling of the geochemical processes with transport and geomechanical processes

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**CALL FOR PAPERS**

**Structure and Reactivity of Cementitious Materials from Advanced  
Characterization Techniques**

253<sup>rd</sup> American Chemical Society National Meeting & Exposition

San Francisco, California, April 2-6, 2017

**Abstract submission deadline: October 31<sup>st</sup>, 2016**

We cordially invite you to join our session on the “Structure and Reactivity of Cementitious Materials from Advanced Characterization Techniques”. This session will provide us with an opportunity to discuss recent results and future research trends related to the chemical properties of cementitious materials and associated systems. Abstracts of experimental studies employing high-resolution spatial and temporal probes, as well as advanced modeling approaches, are encouraged. A special emphasis will be given to studies using advanced nanoscale characterization tools.

The topics that would be covered in this session are, but are not limited to:

- Cement hydration and microstructure
- Nuclear waste immobilization
- Reactivity and durability studies
- Supplementary and alternative cementitious materials
- Nanoscale experiments and modeling
- Advanced measurement techniques

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