

## 256<sup>th</sup> ACS National Meeting & Exposition, August 19-23, 2018, Boston, MA

ACS Meeting Theme: Nanoscience, Nanotechnology & Beyond

Program Chair: Ramanathan Nagarajan (NAGU) [Ramanathan.Nagarajan.Civ@mail.mil](mailto:Ramanathan.Nagarajan.Civ@mail.mil)

### Deadline for online submission of abstracts 26 March 2018

Go to <http://abstracts.acs.org> select the Boston meeting and then follow instructions to submit your abstract to the selected COLL Division symposium

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### Sci-Mix

Authors submitting abstracts online, whether for oral or poster presentation, will be asked to indicate during abstract submission, their interest in participating in Sci-Mix. Sci-Mix is a poster session involving all Divisions of ACS, with the Divisions selecting what presentations to include in the Sci-Mix. If you are making an oral presentation in the Division but have been selected to the Sci-Mix. You will also have to prepare the work for the poster presentation at Sci-Mix.

Sci-Mix is traditionally held on Monday evening at 8:00 PM. The number of posters at Sci-Mix to be selected by a Division is limited to 10% of the total number of papers presented in that Division. Therefore, selection to present Sci-Mix posters is a special recognition conferred by the Division to the authors. Sci-Mix poster presentations are duplicates of the presentations made at the oral or poster sessions of the Division. Please note that this is the only kind of duplicate presentation allowed by ACS.

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### Technical Symposia Scheduled

Symposium Organizer	Symposium Title
D. Howard Fairbrother, Department of Chemistry, Johns Hopkins University, Baltimore, MD 21218; 410-516-4328; <a href="mailto:howardf@jhu.edu">howardf@jhu.edu</a> Nancy Falk, Clorox Services Company, Oakland, CA; <a href="mailto:Nancy.Falk@clorox.com">Nancy.Falk@clorox.com</a> Lorena Tribe, Department of Chemistry, Pennsylvania State University - Berks Campus, Reading, PA 19610; 610-396-6187; <a href="mailto:lut1@psu.edu">lut1@psu.edu</a>	Colloid and Surface Chemistry in Industry: Applications and Career Opportunities
P. Somasundaran, Langmuir Center for Colloids and Interfaces, Columbia University, New York, N.Y. 10027; (212) 854-2926; <a href="mailto:ps24@columbia.edu">ps24@columbia.edu</a> Irina Chernyshova, Columbia University, New York, N.Y. 10027; (212) 854-9366; <a href="mailto:ic2228@columbia.edu">ic2228@columbia.edu</a> Qingxia (Chad) Liu, University of Alberta, Edmonton, Canada, T6G 1H9; (780) 492-1119; <a href="mailto:qingxia2@ualberta.ca">qingxia2@ualberta.ca</a>	Colloidal and Interfacial Science in Separation Processes

<p>Sathish Ponnurangam, Department of Chemical &amp; Petroleum Engineering, University of Calgary, Calgary, Alberta, T2N 1N4; (403) 210-7342; <a href="mailto:sathish.ponnurangam@ucalgary.ca">sathish.ponnurangam@ucalgary.ca</a></p>	
<p>Jie He, Department of Chemistry and Institute of Materials Science, University of Connecticut, Storrs, CT 06269; <a href="mailto:jie.he@uconn.edu">jie.he@uconn.edu</a>  Yugang Sun, Department of Chemistry, Temple University, Philadelphia, PA 19122; <a href="mailto:ygsun@temple.edu">ygsun@temple.edu</a>  Hongyou Fan, Advanced Materials Lab, Sandia National Laboratories, Albuquerque, NM 87106; <a href="mailto:hfan@sandia.gov">hfan@sandia.gov</a></p>	<p>Frontiers and Challenges in Nanoparticle-Mediated Chemical Transformations</p>
<p>Kazuo Sakurai, Department of Chemistry and Biochemistry, University of Kitakyushu, Kikkyushu, Fukuoka, 808-0135, Japan; (093) 695-3294; <a href="mailto:sakurai@kitakyu-u.ac.jp">sakurai@kitakyu-u.ac.jp</a>  Marc A. Ilies, Department of Pharmaceutical Sciences, Temple University School of Pharmacy, Philadelphia, PA 19140; 215-707-1749; <a href="mailto:mailies@temple.edu">mailies@temple.edu</a></p>	<p>Synthetic Self-assembled Systems for Drug and Nucleic acid Delivery: New Materials, Formulation Strategies, Targeting, Toxicity and Regulatory Issues</p>
<p>Jie Zheng, Department of Chemistry and Biochemistry, The University of Texas at Dallas, TX, 75080, USA 972-883-5768, <a href="mailto:jiezheng@utdallas.edu">jiezheng@utdallas.edu</a>  Zhen Gu, Joint Department of Biomedical Engineering, The University of North Carolina at Chapel Hill and North Carolina State University, NC, 27695; 919-515-7944; <a href="mailto:zgu@email.unc.edu">zgu@email.unc.edu</a> / <a href="mailto:zqu3@ncsu.edu">zqu3@ncsu.edu</a>  Jin Xie, Department of Chemistry, The University of Georgia Athens, GA 30602; 706-542-1933; <a href="mailto:jinxie@uga.edu">jinxie@uga.edu</a>  Gang Han, Department of Biochemistry and Molecular Pharmacology, University of Massachusetts- Medical School Worcester, MA, 01605; 508-856-3297; <a href="mailto:gang.han@umassmed.edu">gang.han@umassmed.edu</a>  Zhenjia Wang, Department of Pharmaceutical Sciences, College of Pharmacy, Washington State University, Spokane, WA 99210; 509-368-6563; <a href="mailto:Zhenjia.wang@wsu.edu">Zhenjia.wang@wsu.edu</a></p>	<p>Nanomedicines: From Fundamentals to Applications</p>
<p>Stefan Wilhelm, Stephenson School of Biomedical Engineering, University of Oklahoma, Norman, OK 73072; 405-325-4982; <a href="mailto:stefan.wilhelm@ou.edu">stefan.wilhelm@ou.edu</a>  Betty Y.S. Kim, Department of Neurosurgery, Cancer Biology and Neurosciences, Mayo Clinic, Jacksonville, FL, 32224; 904-953-0350; <a href="mailto:kim.betty@mayo.edu">kim.betty@mayo.edu</a></p>	<p>Nanomedicine: Colloidal Nanomaterials for Bio-imaging, Diagnosis, and Treatment</p>
<p>Wolfgang Parak, Department of Physics, University of Hamburg, Hamburg, Germany; Bioengineered Particles Laboratory, CIC biomaGUNE, Donostia – San Sebastián, Spain. <a href="mailto:wolfgang.parak@physik.uni-marburg.de">wolfgang.parak@physik.uni-marburg.de</a>  Pablo del Pino, BioNanoTools Laboratory, Center for Research in Biological Chemistry and Molecular Materials (CiQUS), Universidade de Santiago de Compostela, Santiago de Compostela. <a href="mailto:pablo.delpino@usc.es">pablo.delpino@usc.es</a>  Luis M. Liz-Marzán, Bionanoplasmonics Laboratory, CIC biomaGUNE, Paseo de Miramón 182, Donostia – San Sebastián, Spain. <a href="mailto:lizmarzan@cicbiomagune.es">lizmarzan@cicbiomagune.es</a></p>	<p>Heating with Colloidal Nanoparticles: Physical Mechanisms and Applications in Life Science</p>

<p>Nathan D. Burrows, Department of Chemistry, Pennsylvania State University, University Park, PA 16802; <a href="mailto:ndburrows@psu.edu">ndburrows@psu.edu</a>  Matthew R. Jones, Department of Chemistry, University of California, Berkeley, CA 94720; <a href="mailto:mrjones55@berkeley.edu">mrjones55@berkeley.edu</a></p>	<p>Advances in Colloid &amp; Surface Chemistry enabled by Cryogenic and in situ Liquid-cell Electron Microscopy</p>
<p>Rongchao Jin, Department of Chemistry, Carnegie Mellon University, Pittsburgh, PA 15213; <a href="mailto:rongchao@andrew.cmu.edu">rongchao@andrew.cmu.edu</a>  Gangli Wang, Department of Chemistry, Georgia State University, Atlanta, GA 30302 ; <a href="mailto:glwang@gsu.edu">glwang@gsu.edu</a>  Gang Chen, Department of Chemistry, Univ of Central Florida, Orlando, FL 32816; <a href="mailto:Gang.Chen@ucf.edu">Gang.Chen@ucf.edu</a></p>	<p>Toward Atomic Precision in Controlling the Low Dimensional Materials</p>
<p>Jennifer A. Hollingsworth, Materials Physics &amp; Applications Division - Center for Integrated Nanotechnologies, Los Alamos National Laboratory; <a href="mailto:jenn@lanl.gov">jenn@lanl.gov</a>  Ramanathan Nagarajan, Natick Soldier Research, Development &amp; Engineering Center, General Greene Avenue, Natick MA 01760; <a href="mailto:Ramanathan.Nagarajan.Civ@mail.mil">Ramanathan.Nagarajan.Civ@mail.mil</a></p>	<p>Nanomaterials</p>
<p>Steven Tait, Dept. of Chemistry, Indiana University; <a href="mailto:tait@indiana.edu">tait@indiana.edu</a></p>	<p>Surface Chemistry</p>
<p>Andrew Goodwin, Department of Chemical and Biological Engineering, University of Colorado, Boulder, CO; <a href="mailto:andrew.goodwin@colorado.edu">andrew.goodwin@colorado.edu</a>  Vernita Gordon, Center for Nonlinear Dynamics, Institute for Cellular and Molecular Biology, University of Texas at Austin, Austin, TX; <a href="mailto:gordon@chaos.utexas.edu">gordon@chaos.utexas.edu</a></p>	<p>Biomaterials and Biointerfaces</p>
<p>Jeffrey D. Clogston, Nanotechnology Characterization Lab, NIH, Frederick, MD 21702; 301-846-1388; <a href="mailto:clogstonj@mail.nih.gov">clogstonj@mail.nih.gov</a>  Patrick Lim Soo, Pfizer, Andover, MA 01810; 978-247-4285; <a href="mailto:Patrick.limsoo@pfizer.com">Patrick.limsoo@pfizer.com</a>  Sonke Svenson, NanoCarrier US; 781- 219-4958; <a href="mailto:svenson@nanocarrier.co.jp">svenson@nanocarrier.co.jp</a>  Vincent A. Hackley, NIST; <a href="mailto:vince.hackley@nist.gov">vince.hackley@nist.gov</a>  Xiaoming Xu, FDA-CDER Nanotechnology Working Group; <a href="mailto:Xiaoming.xu@fda.hhs.gov">Xiaoming.xu@fda.hhs.gov</a>  Sanyogitta Puri, AstraZeneca; <a href="mailto:Sanyogitta.puri@astrazeneca.com">Sanyogitta.puri@astrazeneca.com</a>  Adriale Prina-Mello, ETPN Toxicology and Characterization Working Group, Trinity College Dublin, Ireland; 353-1-8963259; <a href="mailto:prinamea@tcd.ie">prinamea@tcd.ie</a></p>	<p>Particle Sizing of Nanoparticles: From Regulatory and Metrology Aspects to Application and Analysis</p>
<p>Ramanathan Nagarajan (NAGU), Natick Soldier Research, Development &amp; Engineering Center, General Greene Avenue, Natick MA 01760; <a href="mailto:Ramanathan.Nagarajan@us.army.mil">Ramanathan.Nagarajan@us.army.mil</a></p>	<p>Basic Research in Colloids, Surfactants and Nanomaterials</p>
<p>Ramanathan Nagarajan (NAGU), Natick Soldier Research, Development &amp; Engineering Center, General Greene Avenue, Natick MA 01760; 508-233-6445; <a href="mailto:Ramanathan.Nagarajan@us.army.mil">Ramanathan.Nagarajan@us.army.mil</a></p>	<p>Langmuir Lectures, NanoLetters Award Lecture, ACS Materials and Interfaces Award Lecture (Invited Only)</p>
<p>Ramanathan Nagarajan (NAGU), Natick Soldier Research, Development &amp; Engineering Center, General Greene Avenue, Natick MA 01760; 508-233-6445; <a href="mailto:Ramanathan.Nagarajan@us.army.mil">Ramanathan.Nagarajan@us.army.mil</a></p>	<p>Fundamental Research in Colloids, Surfaces and Nanomaterials (POSTER SESSION)</p>

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## Colloid and Surface Chemistry in Industry: Applications and Career Opportunities

### Organizers:

D. Howard Fairbrother, Department of Chemistry, Johns Hopkins University, Baltimore, MD 21218; 410-516-4328; [howardf@jhu.edu](mailto:howardf@jhu.edu)

Nancy Falk, Clorox Services Company, Oakland, CA; [Nancy.Falk@clorox.com](mailto:Nancy.Falk@clorox.com)

Lorena Tribe, Department of Chemistry, Pennsylvania State University - Berks Campus, Reading, PA 19610; 610-396-6187; [lut1@psu.edu](mailto:lut1@psu.edu)

A wide variety of diverse industries and companies are actively pursuing research in areas of relevance to colloids and surface chemists. However, students who are potentially interested in industrial careers typically lack relevant information about life in industry, including the nature of on-going research within different companies, the workplace environment, potential career trajectories within different companies and how best to position themselves as job candidates to employers. To address these issues this symposium will feature a number of talks that highlight ongoing research and career opportunities from representative members of industries whose research involves aspects of colloids and/or surface chemistry, including start-up companies and instrument manufacturers. In addition to the symposium itself a reception/round table event will be held on site to help facilitate informal conversations and networking opportunities between presenters and student members. The round table will include a question and answer session where industry participants will be able to answer specific questions, such as "What are the best ways for a student to position themselves for a career in industry?", "What types of positions (e.g. postdocs, summer interns, regular inters) are available to students?", "What are the key things industry looks for in a CV from a job applicant?", and "How can I secure an industrial internship and how valuable is this in job applications?".

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## Colloidal and Interfacial Science in Separation Processes

### Organizers:

P. Somasundaran, Langmuir Center for Colloids and Interfaces, Columbia University, New York, N.Y. 10027; (212) 854-2926; [ps24@columbia.edu](mailto:ps24@columbia.edu)

Irina Chernyshova, Columbia University, New York, N.Y. 10027; (212) 854-9366; [ic2228@columbia.edu](mailto:ic2228@columbia.edu)

Qingxia (Chad) Liu, University of Alberta, Edmonton, Canada, T6G 1H9; (780) 492-1119; [qingxia2@ualberta.ca](mailto:qingxia2@ualberta.ca)

Sathish Ponnurangam, Department of Chemical & Petroleum Engineering, University of Calgary, Calgary, Alberta, T2N 1N4; (403) 210-7342; [sathish.ponnurangam@ucalgary.ca](mailto:sathish.ponnurangam@ucalgary.ca)

Separation processes are indispensable building blocks of our modern civilization. They underpin processing of raw materials (e.g., metals and minerals), recycling of end-of-the-life products, treatment of waste streams, purification, concentration of the analyte for detection, and environmental remediation. Colloidal and interfacial phenomena have been beneficially applied for many of these processes, forming the foundation of the separation science and techniques. At the same time, the separation unit operations are typically the major consumers of energy and water in most industrial operations and the potential source for environmental pollutions. Hence, to underpin design of new more cost- and energy- efficient processes, there is a great urgency in a deeper understanding of the fundamentals of the associated colloidal and interfacial phenomena.

This symposium explores the recent advancements in the colloid and interfacial science and fundamentals relevant to separation processes with the focus on the new separation techniques. In particular, the symposium focuses on but is not limited to the colloid and interfacial chemistry of

- Emulsion- and membrane-based separation/extraction;
- Adsorption, chromatography, nanoparticles, and ion-exchange;
- Green-separation processes;
- Fundamentals of phase equilibria and kinetics of mass transfer in complex separation systems;
- Bioseparation;
- Electrochemical separation;
- Flotation-based extraction and separation.

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## Frontiers and Challenges in Nanoparticle-Mediated Chemical Transformations

### Organizers:

Jie He, Department of Chemistry and Institute of Materials Science, University of Connecticut, Storrs, CT 06269; [jie.he@uconn.edu](mailto:jie.he@uconn.edu)

Yugang Sun, Department of Chemistry, Temple University, Philadelphia, PA 19122; [ygsun@temple.edu](mailto:ygsun@temple.edu)

Hongyou Fan, Advanced Materials Lab, Sandia National Laboratories, Albuquerque, NM 87106; [hfan@sandia.gov](mailto:hfan@sandia.gov)

Nanoparticles with well-defined structures are of broad interest in chemical transformations and energy conversion. Benefiting from their large surface-to-volume ratios, abundant low-coordinated surface atoms and controllable surface energy, nanoparticles have been extensively studied in a broad range of reactions. With the rapid advances in synthesis, an increasing number of nanoparticles with customized sizes, morphologies, surface lattices, chemical compositions and surface ligands are available. Studies on how nanostructures, surface energy and surface ligands impact their catalytic performance become possible in chemical and energy transformations. This symposium will focus on the design of nanomaterials with defined nanostructures to solve the fundamental challenges on the understanding of the synthesis-nanostructure-activity correlations of functional nanoparticles. A broad range of topics from synthesis, surface characterization, reaction mechanisms, to theory modeling will be highlighted in this symposium:

- Conversion of CO<sub>2</sub>, N<sub>2</sub> and CH<sub>4</sub>
  - Water splitting using nanoparticles
  - Controlled synthesis of catalytically active nanoparticles
  - Controlled synthesis of catalytically active hybrid nanomaterials
  - Assembly of nanomaterials for complex reactions
  - Plasmon-enhanced photocatalysis
  - Hot carrier-driven chemical transformations
  - Eletrocatalysis using defined nanoparticles
  - The role of surface ligands in tuning reaction pathways
  - Surface spectroscopy to characterize reaction mechanism
  - Product selectivity control using nanomaterials
  - Theory and modeling of reaction mechanism
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## Synthetic Self-assembled Systems for Drug and Nucleic acid Delivery: New Materials, Formulation Strategies, Targeting, Toxicity and Regulatory Issues

### Organizers:

Kazuo Sakurai, Department of Chemistry and Biochemistry, University of Kitakyushu, Kitakyushu, Fukuoka, 808-0135, Japan; (093) 695-3294; [sakurai@kitakyu-u.ac.jp](mailto:sakurai@kitakyu-u.ac.jp)

Marc A. Ilies, Department of Pharmaceutical Sciences, Temple University School of Pharmacy, Philadelphia, PA 19140; 215-707-1749; [mailies@temple.edu](mailto:mailies@temple.edu)

The physicochemical properties of many drugs are dictated to a great extent by their main biochemical target. In turn, these properties delineate specific ADME/PK profiles, many times suboptimal. Drug delivery systems (DDSs) have the ability to change the PK profile of their cargo, to protect it from premature decomposition or inactivation, and to control the spatial-temporal location and duration of the therapeutic effect associated with cargo delivery. Particularly attractive are the self-assembled DDSs, due to their simplicity, reproducibility and scalability. The focus of this symposium is to present the most recent efforts in this area, considering both “classical” drugs, as well as nucleic acids as cargo. Particular emphasis is placed on the synthesis of new amphiphiles with controlled self-assembling properties, of amphiphile conjugates with moieties targeting over-expressed epitopes in various diseases for focused delivery, innovative conjugation strategies and state-of-the art methods for characterization of amphiphiles and their supramolecular DDSs. New formulation strategies for high loading and tuned release profiles are also of interest, together with theoretical studies that support them. We are also inviting studies correlating the structure and physicochemical parameters of DDSs with PK profile and toxicity. Contributions towards the standardization of DDS characterization, regulatory and safety issues related with DDS are requested too.

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## Nanomedicines: From Fundamentals to Applications

### Organizers:

Jie Zheng, Department of Chemistry and Biochemistry, The University of Texas at Dallas, TX, 75080, USA 972-883-5768, [jiezheng@utdallas.edu](mailto:jiezheng@utdallas.edu)

Zhen Gu, Joint Department of Biomedical Engineering, The University of North Carolina at Chapel Hill and North Carolina State University, NC, 27695; 919-515-7944; [zgu@email.unc.edu](mailto:zgu@email.unc.edu) / [zqu3@ncsu.edu](mailto:zqu3@ncsu.edu)

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Gang Han, Department of Biochemistry and Molecular Pharmacology, University of Massachusetts-Medical School Worcester, MA, 01605; 508-856-3297; [gang.han@umassmed.edu](mailto:gang.han@umassmed.edu)

Zhenjia Wang, Department of Pharmaceutical Sciences, College of Pharmacy, Washington State University, Spokane, WA 99210; 509-368-6563; [Zhenjia.wang@wsu.edu](mailto:Zhenjia.wang@wsu.edu)

In the past few years, significant progress has been made in expediting clinical translation of nanomedicines but some challenges remain ahead. This symposium will serve as a forum to discuss the latest breakthroughs in the fundamental understandings of in vivo transport of nanomedicines, new strategies for enhancing their targeting and clearance, innovative applications in the disease detection and therapy. Appropriate topics include, but are not limited to:

- In vivo transport of nanomedicines
- Clearance pathways and mechanisms
- Approaches for targeting or modulating tumor microenvironment
- Nanotherapeutics for inflammatory diseases

- New delivery strategies, formulations and devices

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## Nanomedicine: Colloidal Nanomaterials for Bio-imaging, Diagnosis, and Treatment

### Organizers:

Stefan Wilhelm, Stephenson School of Biomedical Engineering, University of Oklahoma, Norman, OK 73072; 405-325-4982; [stefan.wilhelm@ou.edu](mailto:stefan.wilhelm@ou.edu)

Betty Y.S. Kim, Department of Neurosurgery, Cancer Biology and Neurosciences, Mayo Clinic, Jacksonville, FL, 32224; 904-953-0350; [kim.betty@mayo.edu](mailto:kim.betty@mayo.edu)

Nanomedicine is a diverse and highly interdisciplinary research field with the ultimate goal to design and fabricate nanomaterials for medical and clinical applications. This symposium will highlight challenges and opportunities for colloidal nanomaterials regarding their applications in imaging, sensing, diagnosis, treatment, and therapy. Special emphasis will be placed on chemical design, synthesis, biofunctionalization, and nanomaterial characterization. The symposium will also give particular attention to research that aims at the understanding of nanomaterial-biology (nano-bio) interactions and the utilization of nanomaterials for immunoengineering. The modulation of the immune system with rationally designed nanomaterials is a rapidly growing research area of nanomedicine and provides the potential to transform treatment and therapy strategies for diseases, including cancer. Appropriate topics that will be covered by this symposium include, but are not limited to:

- Nanomaterial synthesis, surface engineering, and characterization
- Biofunctionalization
- Nano-bio interactions
- Nanomaterials for bio-analysis, bio-detection, sensing, and diagnosis
- Nanomaterials for bio-imaging
- Nanomaterial based treatment and therapy
- Nanotheranostics
- Toxicity and immunogenicity of colloidal nanomaterials
- Nano-immunoengineering

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## Heating with Colloidal Nanoparticles: Physical Mechanisms and Applications in Life Science

### Organizers:

Wolfgang Parak, Department of Physics, University of Hamburg, Hamburg, Germany; Bioengineered Particles Laboratory, CIC biomaGUNE, Donostia – San Sebastián, Spain.  
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Pablo del Pino, BioNanoTools Laboratory, Center for Research in Biological Chemistry and Molecular Materials (CiQUS), Universidade de Santiago de Compostela, Santiago de Compostela.  
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Luis M. Liz-Marzán, Bionanoplasmonics Laboratory, CIC biomaGUNE, Paseo de Miramón 182, Donostia  
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Inorganic colloidal nanoparticles (NPs) can have large absorption cross-sections for electromagnetic fields and thus energy can be deposited into them. Upon dissipation, heat is transferred to their environment, which can be harnessed for several applications in life science, such as controlled release, selective destruction of cells and tissues, thermal imaging, optoacoustic imaging and biosensing. This symposium will cover: heating of plasmonic NPs with light, heating of magnetic NPs with alternating magnetic fields (AMF), and all related aspects, including mechanisms of energy absorption, conversion, and dissipation, as well as coupling and amplification effects of adjacent NPs. Appropriate topics include, but are not limited to:

- Nanoparticle synthesis and characterization
- Self-assembled nanoparticle colloids
- Biofunctionalization
- Colloidal stability in biofluids
- Contrast properties: thermal and optoacoustic
- Photothermal therapy
- Magnetic fluid hyperthermia
- Photothermal biosensing
- Drug delivery
- Responsive particles and labels

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## Advances in Colloid & Surface Chemistry enabled by Cryogenic and in situ Liquid-cell Electron Microscopy

Organizers:

Nathan D. Burrows, Department of Chemistry, Pennsylvania State University, University Park, PA 16802;  
[ndburrows@psu.edu](mailto:ndburrows@psu.edu)

Matthew R. Jones, Department of Chemistry, University of California, Berkeley, CA 94720;  
[mrjones55@berkeley.edu](mailto:mrjones55@berkeley.edu)

This symposium will focus on the application of cryogenic and in situ liquid-cell electron microscopy techniques in the study of colloids. Topic areas to be covered include:

- dynamics of nanoparticle nucleation and dissolution,
  - nanostructure formation and growth,
  - protein matrix-directed mineralization / biomineralization,
  - oriented attachment,
  - mesocrystal formation,
  - nanoparticle aggregation,
  - directed nanoparticle assembly,
  - catalysts size, distribution, aggregation, and life cycle in a liquid environment
-



## Toward Atomic Precision in Controlling the Low Dimensional Materials

### Organizers:

Rongchao Jin, Department of Chemistry, Carnegie Mellon University, Pittsburgh, PA 15213;  
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Gangli Wang, Department of Chemistry, Georgia State University, Atlanta, GA 30302; [glwang@gsu.edu](mailto:glwang@gsu.edu)

Gang Chen, Department of Chemistry, Univ of Central Florida, Orlando, FL 32816; [Gang.Chen@ucf.edu](mailto:Gang.Chen@ucf.edu)

Atomically precise low-dimensional materials are emerging as a new frontier in nanoscience research. This symposium will focus on research advances in controlling nanomaterials with atomic precision, such as atomically precise metal nanoclusters and nanoparticles, semiconductor nanoclusters, and two dimensional materials with precisely controlled thickness at the atomic level. The atomic-level control in materials is of critical importance in order to understand the fundamentals of material properties for structure-property correlation at the single-atom and single-electron levels. The symposium will bring together experimentalists and theoreticians, and blend the synthesis, measurements, and simulations in hopes of fostering collaborations between researchers from different disciplines. The atomic level design of materials will provide many exciting opportunities for discovering new properties and developing exciting applications.

The program will be organized in 8 half-day sessions. Each session includes 4 invited speakers along with several contributed talks representing each specific topic. We will make efforts to invite young investigators and women scientists who have established a promising research program to promote young generations and female excellence in science.

- Advances in atomically precise synthesis
- Structure characterization
- Optical properties
- Electron properties
- Theoretical modeling
- Catalytic and sensing applications
- Biological and biomedical applications
- Energy applications

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## Nanomaterials

### Organizers:

Jennifer A. Hollingsworth, Materials Physics & Applications Division - Center for Integrated Nanotechnologies, MS-K771, Los Alamos National Laboratory; (505) 665-0399; [jenn@lanl.gov](mailto:jenn@lanl.gov)

Ramanathan Nagarajan, Natick Soldier Research, Development & Engineering Center, General Greene Avenue, Natick MA 01760; 508-233-6445; [Ramanathan.Nagarajan.Civ@mail.mil](mailto:Ramanathan.Nagarajan.Civ@mail.mil)

Nanoscale confinement of dimensionality in three, two and even only one dimension affords new and emergent properties that impact the fundamental chemistry and physics of nanomaterials. Basic research in nanomaterials synthesis, interactions and properties, especially those related to the colloidal nature of the nanomaterial or to effects governed by chemistry at nanoscale surfaces and interfaces will be appropriate for this symposium. Topics of interest include but are not limited to:

- Fundamentals of nanomaterials synthesis
- Surface modification
- Self-assembly: influences of surface chemistry, shape, solution additives
- Directed assembly: influences of functionalization, shape and structure-directing/ templating agents, and substrate effects
- Advanced characterization techniques to probe nanomaterials synthesis and assembly
- Basic research into functional properties of nanomaterials
- Multi-component nanomaterials, e.g., heterostructured (comprising semiconducting, metallic and/or dielectric segments) and doped nanocrystals
- 0-dimensional materials (e.g., quantum dots, metal nanoparticles), 1-dimensional materials (e.g., nanowires, nanotubes), and 2-dimensional materials (e.g., graphene, transition metal dichalcogenides, nanoplatelets, nanosheets, colloidal quantum wells)

Topics covered by other nanomaterials related thematic symposia within the COLL Division will not be emphasized in this symposium.

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## Surface Chemistry

Organizer:

Steven Tait, Dept. of Chemistry, Indiana University, Bloomington, IN 47405; (812) 855-1302;  
[tait@indiana.edu](mailto:tait@indiana.edu)

This symposium will consist of oral presentations on new advances in surface chemistry, including reactions at surfaces, chemisorption, adsorption/desorption, deposition and growth, kinetics of surface processes, surface structure, nanomaterials at surfaces, advances in surface analysis, manipulation of surface structure and chemistry, self-assembly at surfaces, and other topics related to surface chemistry. These sessions will include interdisciplinary topics relevant to fundamental surface chemistry, as well as to a range of chemical and materials applications.

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## Biomaterials and Biointerfaces

Organizers:

Andrew Goodwin, Department of Chemical and Biological Engineering, University of Colorado, Boulder, CO; [andrew.goodwin@colorado.edu](mailto:andrew.goodwin@colorado.edu)

Vernita Gordon, Center for Nonlinear Dynamics, Institute for Cellular and Molecular Biology, University of Texas at Austin, Austin, TX; [gordon@chaos.utexas.edu](mailto:gordon@chaos.utexas.edu)

This symposium will cover all topics of interest to biologically relevant research in colloid and surface science focusing on biological interfaces and the interaction of abiotic material surfaces with biological systems. Areas of interest include the theory, principles, design, and synthesis of biomaterials; the use of biomaterials in tissue engineering; characterization of new or existing biomaterials; and the interactions of biomaterials with proteins, membranes, cells, and tissues.

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# Particle Sizing of Nanoparticles: From Regulatory and Metrology Aspects to Application and Analysis

## Organizers:

Jeffrey D. Clogston, Nanotechnology Characterization Lab, NIH, Frederick, MD 21702  
301-846-1388; [clogstonj@mail.nih.gov](mailto:clogstonj@mail.nih.gov)

Patrick Lim Soo, Pfizer, Andover, MA 01810; 978-247-4285; [Patrick.limsoo@pfizer.com](mailto:Patrick.limsoo@pfizer.com)

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Vincent A. Hackley, NIST; [vince.hackley@nist.gov](mailto:vince.hackley@nist.gov)

Xiaoming Xu, FDA-CDER Nanotechnology Working Group; [Xiaoming.xu@fda.hhs.gov](mailto:Xiaoming.xu@fda.hhs.gov)

Sanyogitta Puri, AstraZeneca; [Sanyogitta.puri@astrazeneca.com](mailto:Sanyogitta.puri@astrazeneca.com)

Adrielle Prina-Mello, ETPN Toxicology and Characterization Working Group, Trinity College Dublin, Ireland; 353-1-8963259; [prinamea@tcd.ie](mailto:prinamea@tcd.ie)

The symposium will focus on representatives from regulatory, government and industry presenting on the various aspects of particle sizing as it relates to nanomedicine/nanotechnology which is in alignment with the theme for the Fall ACS 2018 meeting. The symposium will include keynote speakers from regulatory/government, industry presentations from pharm/biotech, rapid fire presentations on novel particle sizing technologies, and a roundtable discussion involving all the speakers. The keynote speakers will provide the regulatory and metrology perspective, the industry presentations will focus on application, the rapid fire presentations will provide context as to how to analyze particle size using new technologies/instrumentations and finally the roundtable will bring together the different topics in a discussion which will engage the speakers as well as the audience. We believe that this symposium on particle size is of great interest to those colleagues in academia, industry and government. Particle size is a key quality attribute of a nanomedicine drug product and it is important to understand how it is being analyzed and by which analytical tools. In addition, since the presentations will come exclusively from industry/government, then this would be of interest to many students/postdocs looking to learn/network with individuals at these respective companies/institutions.

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## Basic Research in Colloids, Surfactants and Nanomaterials

### Organizer:

Ramanathan Nagarajan, Natick Soldier Research, Development & Engineering Center, General Greene Avenue, Natick MA 01760; 508-233-6445; [Ramanathan.Nagarajan.Civ@mail.mil](mailto:Ramanathan.Nagarajan.Civ@mail.mil)

This symposium will accept papers in all areas of colloids, surfactants and nanomaterials that are not covered by other thematic symposia. Experimental, theoretical and computational studies in all areas are encouraged for submission. Since there are many overlapping thematic symposia on these topics, submit to the Basic Research symposium only if none of the other thematic symposia appear to be good fit for your work.

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## Langmuir Lectures, NanoLetters Award Lecture, ACS Materials and Interfaces Award Lecture (Invited Papers Only)

### Organizer:

Ramanathan Nagarajan, Natick Soldier Research, Development & Engineering Center, General Greene Avenue, Natick MA 01760; 508-233-6445; [Ramanathan.Nagarajan.Civ@mail.mil](mailto:Ramanathan.Nagarajan.Civ@mail.mil)

This is a plenary session where award lectures will be presented.

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## Fundamental Research in Colloids, Surfaces and Nanomaterials (Poster Session)

Organizer:

Ramanathan Nagarajan, Natick Soldier Research, Development & Engineering Center, General Greene Avenue, Natick MA 01760; 508-233-6445; [Ramanathan.Nagarajan.Civ@mail.mil](mailto:Ramanathan.Nagarajan.Civ@mail.mil)

Posters addressing any aspect of colloids, surfaces and nanomaterials will be appropriate for submission to this symposium. All posters presented by graduate and undergraduate students will be judged by a panel of scientists. Student poster presenters should be prepared to give a 3 minute pitch to the judges who may come to review the posters. Based on the technical content of the poster and the effectiveness of the pitch, the judges will select the best 4 or 5 poster presentations for the COLL Division awards. Awards will be given for graduate students and for undergraduate students.

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