

# 84<sup>th</sup> CSSS Technical Program

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**Monday, June 21, 2010, 8:30 AM – 9:20 AM**

## **Plenary 1**

Ballroom A, Student Union

Organizer/Presider: H. Michael Cheung

**8:30 AM – 1** – Mechanics of Drying Colloidal Dispersions: Fluid/Solid Transitions, Skinning, Crystallization, Delamination, and Cracking. **William B. Russel**, Department of Chemical Engineering, Princeton University

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**Monday, June 21, 2010, 9:40 AM – 5:00 PM**  
**Colloid and Interfacial Chemistry in Biological Systems 1**

335, Student Union

Organizers/Presiders: Harihara Baskaran, Edgar Kooijman, Heidi Martin

**9:40 AM – 2 – Keynote:** Structure and Phenomena at Biomimetic Templates by X-Ray Synchrotron Radiation. **David Vaknin**, Department of Physics & Astronomy, Ames Laboratory, Iowa State University, Ames, IA, 50011

**10:20 AM – 3** – Stability and Efficiency of Bactericidal Emulsion. **Renata Vyhnanekova**, Adi Eisenberg and Theo van de Ven, Department of Chemistry, McGill University, Montreal, QC, Canada, H3A2A7

**10:40 AM – 4** – Surface Tension Gradient Driven Spreading on Mucin Solutions. **Beautia Dew**<sup>3</sup>, **Kevin Koch**<sup>1</sup>, Stephen Garoff<sup>1</sup>, Todd Przybycien<sup>2,3</sup> and Robert Tilton<sup>2,3</sup>, (1)Physics, Carnegie Mellon University, Pittsburgh, PA, 15213, (2)Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213, (3)Biomedical Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213

**11:00 AM – 5** – Cationic Additives for Exogenous Lung Surfactants. **Edgar Acosta**<sup>1,2</sup>, Zdenka Policova<sup>2</sup>, Michael Hair<sup>2</sup> and Wilhelm Neumann<sup>2</sup>, (1)Department of Chemical Engineering and Applied Chemistry, University of Toronto, Canada, (2)Department of Mechanical and Industrial Engineering, University of Toronto, Canada

**11:20 AM – 6** – Spherical Colloids, Bacterial Casts, and Nanotube Replicas: A Topographical Landscape in PDMS for Patterning Lipid Bilayers. **Anand B. Subramaniam**<sup>1</sup>, Sigolene Lecuyer<sup>1</sup>, Kumaran S. Ramamurthi<sup>4</sup>, Richard Losick<sup>3</sup> and Howard A. Stone<sup>2</sup>, (1)School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, 02138, (2)Department of Mechanical and Aerospace Engineering, Princeton University, Cambridge, MA, 02138, (3)Department of Molecular and Cellular Biology, Harvard University, Cambridge, MA, 02138, (4)Laboratory of Molecular Biology, National Cancer Institute, Bethesda, MD, 20892

**11:40 AM** – Lunch.

**1:20 PM – 7** – Effects on the Structure of Langmuir Lipid Monolayers Caused by Charged Headgroups. **David W. Allender**, Department of Physics, Kent State University, Kent, OH, 44242

**1:40 PM – 8** – Phase Separation in Lipid/Cholesterol Monolayers: Direct Comparison of Fluorescence and Brewster Angle Microscopies. **Fanindra P. Bhatta**<sup>1</sup>, Yasmin Isler<sup>2</sup>, David W. Allender<sup>1</sup> and Elizabeth K. Mann<sup>1</sup>, (1)Department of Physics, Kent State University, Kent, OH, 44242, (2)Department of Chemistry, Kent State University, Kent, OH, 44242

**2:00 PM – 9** – Crystallizing Protein by Using Nonamphiphilic Lyotropic Liquid Crystals. **Yan-Yeung Luk**<sup>1</sup>, HongJun Liang<sup>2</sup>, Karen Simon<sup>1</sup> and Ulrich English<sup>3</sup>, (1)Syracuse University, (2)Metallurgical and Materials Engineering, Colorado School of Mines, (3)Cornell High Energy Synchrotron Source, Cornell University

**2:20 PM – 10** – Vesicle Capture on Patterned Surfaces Coated with Amphiphilic Biopolymers. **Vishal Javvaji**<sup>1,2</sup>, Matthew B. Dowling<sup>3</sup>, Payne F. Gregory<sup>2</sup> and Srinivasa R. Raghavan<sup>1</sup>, (1)Department of Chemical and Biomolecular Engineering, University of Maryland, College Park, MD, 20742, (2)Center for Biosystems Research, University of Maryland Biotechnology Institute, College Park, MD, 20742, (3)Fishell Department of Bioengineering, University of Maryland, College Park, MD, 20742

**2:40 PM – 11** – Multiphoton-Excited Intrinsic Fluorescence of Protein Crystals. **Jeremy T. Madden** and Garth J. Simpson, Department of Chemistry, Purdue University, W. Lafayette, IN, 47907

**3:00 PM** – Break.

**3:20 PM – 12** – Shear-Induced Protein Conformation Changes Probed by Fluorescence Spectroscopy and Small-Angle Scattering. Efrosyni Themistou, Indrajit Singh, **Paschalis Alexandridis** and Sriram Neelamegham, Department of Chemical and Biological Engineering, University at Buffalo-The State University of New York (SUNY), Buffalo, NY, 14260-4200

**3:40 PM – 13** – Amphiphilic Biopolymers as Reversible Hemostats: Insights from a Comprehensive Study on Hydrophobically-Modified Chitosan. **Matthew B. Dowling**<sup>1</sup>, Mark Keibler<sup>2</sup>, Rakesh Kumar<sup>2</sup>, John R. Hess<sup>3</sup>, Grant V. Bochicchio<sup>3</sup> and Srinivasa R. Raghavan<sup>1,2</sup>, (1)Fishell Department of Bioengineering, University of Maryland, College Park, College Park, MD, 20742, (2)Department of Chemical and Biomolecular Engineering, University of Maryland, College Park, College Park, MD, 20742, (3)School of Medicine, University of Maryland, Baltimore, Baltimore, MD, 21201

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**4:00 PM – 14** – Molecular Dynamics Simulations of Photosynthetic Pigment-Protein Assemblies. **Cynthia S. Lo**, Sándor Á. Kovács, William P. Bricker and Kelly W. Leung, Department of Energy, Environmental and Chemical Engineering, Washington University in St. Louis, St. Louis, MO, 63130

**4:20 PM – 15** – AFM Study of DNA Release Dynamics from Bioreducible Polyplexes. **Yi Zou**, Lei Wan and Guangzhao Mao, Department of Chemical Engineering and Materials Science, Wayne State University, Detroit, MI, 48202

**4:40 PM – 16** – Bead Arrays in PDMS Wells for Multiplexed Screening Assays. **Thomas F. Leary**, Charles Maldarelli and Alexander Couzis, Department of Chemical Engineering, City College of New York, New York, NY, 10031

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**Monday, June 21, 2010, 9:40 AM – 5:00 PM**

**General Papers 1**

312, Student Union

Organizers: Michael Bevan, Joelle Frechette

Presider: Ali Mohraz

**9:40 AM – 17 – Keynote:** Interactions Can Tune Structure of Complex Fluids, but Can They Dial-in Dynamics?. **Thomas M. Truskett**, Chemical Engineering, The University of Texas at Austin, Austin, TX, 78712

**10:20 AM – 18** – Colloidal Silica Gelation Dynamics. **Xiujuan Cao**<sup>1</sup>, Herman Cummins<sup>2</sup> and Jeff Morris<sup>1</sup>, (1)Chemical Engineering, The City College of New York, Graduate Center, New York, NY, 10031, (2)Physics, The City College of New York, New York, NY, 10031

**10:40 AM – 19** – Theory of Colloidal Stability in Shear Flow. **Alessio Zaccone**, Hua Wu and Massimo Morbidelli, Department of Chemistry, ETH Zurich, Zurich, Switzerland

**11:00 AM – 20** – Combined Role of Thermodynamics and Kinetics in the Growth of Colloidal Binary Superlattice Crystals. Raynaldo T. Scarlett, Marie T. Ung, John C. Crocker and **Talid Sinno**, Department of Chemical and Biomolecular Engineering, University of Pennsylvania, Philadelphia, PA, 19104

**11:20 AM – 21** – Diffusing Probes of Ca<sup>2+</sup> Dependent Homophilic Cadherin Interactions within Microfluidic Colloidal Crystals. **Mike Bevan**, Chemical & Biomolecular Engineering, Johns Hopkins University, Baltimore, MD, 21218

**11:40 AM** – Lunch Break.

**1:20 PM – 22 – Keynote:** Equilibrium and Dynamic Interparticle Forces in Binary Colloidal Mixtures. **John Y. Walz**, Department of Chemical Engineering, Virginia Tech, Blacksburg, VA, 24061

**2:00 PM – 23** – Diffusing Colloid Measurements of Protein-Carbohydrate Interactions. **Shannon L. Eichmann** and Michael A. Bevan, Department of Chemical and Biomolecular Engineering, Johns Hopkins University, Baltimore, MD, 21218

**2:20 PM – 24** – Computational and Statistical Predictions for Particle-Surface Interactions with Nanoscale Chemical and Topographical Heterogeneity. **Marina Bendersky**<sup>1</sup>, Jeffrey M. Davis<sup>1</sup> and Maria M. Santore<sup>2</sup>, (1)Chemical Engineering, University of Massachusetts, Amherst, MA, 01003, (2)Polymer Science and Engineering, University of Massachusetts, Amherst, MA, 01003

**2:40 PM – 25** – Characterizing Rolling Friction at the Microscale. **Steven G. Vilt**, Nathaniel Martin, Claire McCabe and Kane Jennings, Department of Chemical and Biomolecular Engineering, Vanderbilt University, Nashville, TN, 37235

**3:00 PM** – Break.

**3:20 PM – 26** – Programmable Microfluidic Materials with Switchable Shape, Stiffness and Color. **Ahmet B. Ucar**<sup>1</sup>, Suk Tai Chang<sup>2</sup>, Frederick J. Renk<sup>3</sup> and Orlin D. Velev<sup>1</sup>, (1)Department of Chemical & Biomolecular Engineering, North Carolina State University, Raleigh, NC, 27695, (2)Department of Chemical Engineering & Materials Science, Chung-Ang University, Seoul, Republic of Korea, (3)Department of Center for Packaging Innovation, MeadWestvaco, Raleigh, NC, 27606

**3:40 PM – 27** – Interfacial Rheology and Mass Transfer Kinetics in Complex, Microchannel Flows. **Jeffrey D. Martin** and Steven D. Hudson, Polymers Division, Complex Fluids Group, National Institute of Standards and Technology, Gaithersburg, MD, 20899

**4:00 PM – 28** – Development and Verification of the Rotating Disk Method of Zeta Potential Measurement. **Reza M. Rock**, Sairam Shekhar, Susana Stepan and Paul J. Sides, Department of Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213

**4:20 PM – 29** – 2D Assembly of Colloid Particles on an Electrode within the Ideally Polarizable Region. **Christopher L. Wirth**, Paul J. Sides and Dennis C. Prieve, Department of Chemical Engineering and Center for Complex Fluids Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213

**4:40 PM – 30** – Polymer- and Nanoparticle-Shelled Bubbles Based on Microfluidics. **Myung Han Lee**<sup>1</sup>, Teresa Brugarolas<sup>1</sup>, Varesh Prasad<sup>2</sup>, Jennifer Kay<sup>3</sup>, Jennifer Kunkel<sup>1</sup> and Daeyeon Lee<sup>1</sup>, (1)Department of Chemical and Biomolecular Engineering, University of Pennsylvania, Philadelphia, PA, 19104, (2)Department of Bioengineering, University of Pennsylvania, Philadelphia, PA, 19104, (3)Department of Chemical Engineering, University of Pittsburgh, Pittsburgh, PA, 15260

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**Monday, June 21, 2010, 9:40 AM – 5:00 PM**

**Physics of Colloids 1**

316, Student Union

Organizers/Presiders: Raymond Dagastine, Daniel Lacks

**9:40 AM – 31 – Keynote:** Evolution of Dynamic Viscoelastic Properties during Structural Arrest and Aging of Colloidal Glasses. **Chinedum Osuji**, Chemical Engineering, Yale University, New Haven, CT, 06511

**10:20 AM – 32 –** Normal Mode Quantization in Colloidal Analog of Nanocrystals. Nicole Green, Margaux Guiche and **Mohammad Islam**, Carnegie Mellon University

**10:40 AM – 33 –** Poly(acrylic Acid) as a Rheology Modifier for Dense Alumina Dispersions in High Ionic Strength Environments. **Prasad Bhosale** and John C. Berg, Department of Chemical Engineering, University of Washington, Seattle, WA, 98195

**11:00 AM – 34 –** A New Shear-Induced Rheological Transition in Colloidal Suspensions. **Alessio Zaccone**, Hua Wu and Massimo Morbidelli, Chemistry and Applied Biosciences, ETH Zurich, Zurich, Switzerland, 8093

**11:20 AM – 35 –** Novel Synthesis of Armored Bubbles and Semi-Permeable Vesicles from the Hydrophilic Clay Montmorillonite. **Anand B. Subramaniam**<sup>1</sup>, Jiandi Wan<sup>2</sup>, Arvind Gopinath<sup>3</sup> and Howard A. Stone<sup>2</sup>, (1)School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, 02138, (2)Department of Mechanical and Aerospace Engineering, Princeton University, Princeton, NJ, (3)Department of Mechanical Engineering, Massachusetts Institute of Technology, Cambridge, MA

**11:40 AM –** Lunch.

**1:20 PM – 36 –** Peak Broadening in Micellar DNA Electrophoresis: Effect of Diffusion, Polydispersity, and Micelle Exchange Kinetics. **Angela L. Holmen**, Stephen B. Istivan, Max A. Fahrenkopf and James W. Schneider, Department of Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213-3890

**1:40 PM – 37 –** Electrokinetic Vortices and Traveling Waves in Nondilute Colloidal Dispersions. **Jonathan D. Posner** and Carlos Perez, Chemical Engineering, Mechanical Engineering, Arizona State University, Tempe, AZ, 85287

**2:00 PM – 38 –** Electric Field-Induced Directed Self-Assembly of Dicolloid Particles. **Mark M. Panczyk**<sup>1</sup>, Jin-Gyu Park<sup>2</sup>, Eric R. Dufresne<sup>2</sup>, Norman J. Wagner<sup>1</sup> and Eric M. Furst<sup>1</sup>, (1)Department of Chemical Engineering, University of Delaware, Newark, DE, 19716, (2)Department of Mechanical Engineering, Yale University, New Haven, CT, 06511

**2:20 PM – 39 –** The Diffusion-Limited Transport Timescale: Effect of Curvature and Finite Bulk Solution Volume. **Nicolas J. Alvarez**<sup>1</sup>, Lynn M. Walker<sup>1</sup> and Shelley L. Anna<sup>1,2</sup>, (1)Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213, (2)Mechanical

Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213

**2:40 PM – 40 –** Retention and Dissolution of Small Energetic Residues in Porous Media: Pore-Scale Observation by Spectral Confocal Microscopy. **Chao Wang**<sup>1</sup>, Volha Lazouskaya<sup>2</sup>, Mark E. Fuller<sup>2</sup>, Jeff Caplan<sup>1,3</sup>, Kirk Czymmek<sup>3,4</sup>, Chongyang Shen<sup>5</sup> and Yan Jin<sup>1</sup>, (1)Department of Plant and Soil Sciences, University of Delaware, Newark, DE, 19716, (2)Shaw Environmental, Inc., Lawrenceville, NJ, 08648, (3)Delaware Biotechnology Institute, University of Delaware, Newark, DE, 19716, (4)Department of Biological Sciences, University of Delaware, Newark, DE, 19716, (5)Department of Soil and Water Sciences, China Agricultural University, Beijing, China, 100094

**3:00 PM –** Break.

**3:20 PM – 41 –** Controlled Motion of Catalytic Nanomotors. **Jonathan D. Posner**, Jeff L. Moran, Nathan Marine and Philip Wheat, Chemical Engineering, Mechanical Engineering, Arizona State University, Tempe, AZ, 85287

**3:40 PM – 42 –** Electrokinetic Locomotion by Reaction Induced Charge Auto-Electrophoresis. **Jeffrey Lawrence Moran** and Jonathan Posner, Mechanical Engineering, Arizona State University, Tempe, AZ, 85282

**4:00 PM – 43 –** Normal Modes and Density of States of Disordered Colloidal Solids. Deniz Kaya, Nicole Green, Craig Maloney and **Mohammad F. Islam**, Carnegie Mellon University, Pittsburgh, PA, 15213

**4:20 PM – 44 –** Non-Covalent Polymerization Promoted by Thermodynamic Incompatibility in Water. **Yan-Yeung Luk**, Jerry Goodisman, Karen A. Simon, Preeti Sejwal, Eric R. Falcone, Erik A. Burton, Deepali Prashar, Debjyoti Bandyopadhyay, Sri Kamesh Narasimhan, Nisha Varghese and Nimal S. Gopalasingham, Chemistry, Syracuse University

**4:40 PM – 45 –** Thin, Robust and Stable Dithiocarbamate-Anchored Amine Functionalization of Gold Nanoparticles in One Step. **Hans D. Robinson** and Kai Chen, Department of Physics, Virginia Tech, Blacksburg, VA, 24061

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**Monday, June 21, 2010, 9:40 AM – 11:40 AM**

**Polymer Colloids 1**

Ballroom C, Student Union

Organizer/Presiders: Yakov Lapitsky, Syed Qutubuddin

**9:40 AM – 46 – Keynote:** Engineered Surfactants: Multiphasic Particles of Controlled Size, Shape, and Chemical Composition. **Joseph M. DeSimone**<sup>1,2</sup>, (1)Department of Chemistry, University of North Carolina at Chapel Hill, Chapel Hill, NC, 27599, (2)Department of Chemical Engineering, North Carolina State University, Raleigh, NC, 27695

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**10:20 AM – 233** – Colloidal particles with unusual asymmetric shapes. **Eric M. Furst** and Bum Jun Park, Department of Chemical Engineering and Center for Molecular and Engineering Thermodynamics, University of Delaware, Newark, Delaware 19716 USA

**10:40 AM – 47** – Polymer Assembly and Disassembly Tuned by Solvents. **Paschalis Alexandridis**, Biswajit Sarkar, Venkataraman Ravi and Jinendra Lakshmi, Department of Chemical and Biological Engineering, University at Buffalo-The State University of New York (SUNY), Buffalo, NY, 14260-4200

**11:00 AM – 121** - Controlled Release in the Lower GI Using Polymerized Microemulsions. **Li Chen** and Harry M. Cheung, Department of Chemical and Biomolecular Engineering, The University of Akron, Akron, OH, 44325

**11:20 AM – 48** – Water Distributions in PS-b-P(S-g-PEO) Block Grafted Copolymers Aggregates in Aqueous Solutions Revealed by Contrast Variation SANS Study. **Xin Li**<sup>1,2</sup>, Kenneth W. Herwig<sup>1</sup>, Wei-Ren Chen<sup>1,4</sup>, Emily Liu<sup>2</sup>, Yun Liu<sup>3,5</sup>, Kunlun Hong<sup>6</sup> and Gregory S. Smith<sup>1</sup>, (1)Neutron Scattering Science Division, Oak Ridge National Lab, Oak Ridge, TN, 37830, (2)Mechanical Aerospace and Nuclear Engineering, Rensselaer Polytechnic Institute, Troy, NY, 12180, (3)Department of Chemical Engineering, University of Delaware, Newark, DE, 19716, (4)Department of Chemical and Biomolecular Engineering, University of Tennessee, Knoxville, TN, 37996, (5)Institute of Standards and Technology, NIST Center for Neutron Research, Gaithersburg, MD, 20899, (6)Center for Nanophase Materials Sciences, Oak Ridge National Lab, Oak Ridge, TN, 37831

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**Monday, June 21, 2010, 9:40 AM – 4:20 PM Scattering**

308, Student Union

Organizer/Presiders: Jennifer O'Donnell, William Meyer

**9:40 AM – 49 – Keynote:** Amphiphilic Self-Assembly in and by Protic Ionic Liquids. **Gregory G. Warr**<sup>1</sup>, Miguel U. Araos<sup>1</sup>, Rob Atkin<sup>2</sup>, Robert Hayes<sup>2</sup>, Sophie M. C. Bobillier<sup>1</sup> and Silvia Imberti<sup>3</sup>, (1)School of Chemistry, The University of Sydney, Sydney, NSW, Australia, 2006, (2)School of Environmental and Life Sciences, The University of Newcastle, Callaghan, NSW, Australia, 2308, (3)Disordered Materials Group, ISIS, Rutherford Appleton Laboratory, United Kingdom

**10:20 AM – 50** – Theoretical Studies on the Structure of Interacting Colloidal Suspensions by Spin-Echo Small Angle Neutron Scattering. **Xin Li**<sup>1,2</sup>, Wei-Ren Chen<sup>1</sup>, Kenneth W. Herwig<sup>1</sup>, Roger Pynn<sup>3</sup>, Emily Liu<sup>2</sup>, Gregory S. Smith<sup>1</sup> and Yun Liu<sup>4</sup>, (1)Neutron Scattering Science Division, Oak Ridge National Lab, Oak Ridge, TN, 37831, (2)Mechanical Aerospace and Nuclear Engineering, Rensselaer Polytechnic Institute, Troy, NY, 12180, (3)Department of Physics, Indiana University, Bloomington, IN, 47405, (4)NIST Center of Neutron

Research, National Institute of Standards and Technology, Gaithersburg, MD, 20899

**10:40 AM – 51** – Formation of Dynamic Clusters in Concentrated Protein Solutions. **Yun Liu**<sup>1,2</sup>, Lionel Porcar<sup>3</sup>, Wei-Ren Chen<sup>4</sup>, Emiliano Fratini<sup>5</sup>, Peter Falus<sup>3</sup>, Piero Baglioni<sup>5</sup> and Kunlun Hong<sup>6</sup>, (1)Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD, 20899, (2)Department of Chemical Engineering, University of Delaware, Newark, MD, 19716, (3)Institut Laue-Langevin, Grenoble, France, (4)Spallation Neutron Source, Oak Ridge National Laboratory, Oak Ridge, TN, 37831, (5)Department of Chemistry and CSGI, University of Florence, Florence, Italy, I-50019, (6)Center for Nanophase Materials, Oak Ridge National Laboratory, Oak Ridge, TN, 37831

**11:00 AM – 52** – Competitive Interactions in Surfactant Solutions: A Neutron Scattering Investigation.

**Ankitkumar I. Fajalia** and Marina Tsianou, Department of Chemical and Biological Engineering, University at Buffalo, SUNY, Buffalo, NY, 14260

**11:20 AM – 53** – Capillary Interactions in Nano-Particles Suspensions. **Dobrin Bossev** and Garfield Warren, Physics, Indiana University, Bloomington, IN, 47405

**11:40 AM** – Lunch.

**1:20 PM – 54 – Keynote:** 1-2 Plane Flow-SANS & Rheo-SANS: Microstructure Measurements of Colloidal Dispersions and Shear Banding Worm-Like Micelles under Flow. **Norman Wagner**, Chemical Engineering, University of Delaware, Newark, DE, 19716

**2:00 PM – 55** – Structural Evolution of Monomer Drops and Polymer Particles during Heterogeneous RAFT Polymerization. **Jennifer O'Donnell**<sup>1,2</sup>, Binh T. T. Pham<sup>2</sup>, Gregory G. Warr<sup>2</sup> and Brian S. Hawkett<sup>2</sup>, (1)Chemical and Biological Engineering, Iowa State University, Ames, IA, 50011, (2)School of Chemistry, The University of Sydney, Sydney, NSW, Australia, 2006

**2:20 PM – 56** – Adsorption of Semi-Flexible Colloidal Rods onto Spherical Particles. **Viet D. Lam** and Lynn M. Walker, Department of Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213

**2:40 PM – 57** – Connecting Particle Microstructure to the Mechanical Reinforcement of Polymer Nanocomposites. **David L. Green** and Maura McEwan Fierro, Chemical Engineering, University of Virginia, Charlottesville, VA, 22904

**3:00 PM** – Break.

**3:20 PM – 58** – Determination of the Conformation of Poly(ethylene-Glycol) Chains Covalently Attached to Lysozyme by Small-Angle Neutron Scattering. **Sheetal S. Pai**<sup>1</sup>, Todd M. Przybycien<sup>1,2</sup> and Robert D. Tilton<sup>1,2</sup>, (1)Department of Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213, (2)Department of Biomedical Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213

**3:40 PM – 59** – Characterization of the Nanostructure of Complexes Formed by a Redox-Active Cationic Lipid and DNA Using Small-Angle Neutron Scattering and cryo-TEM. **John P. E. Muller**<sup>1</sup>, Burcu S. Aytar<sup>1</sup>, Sharon Golan<sup>2</sup>, Yeshayahu Talmon<sup>2</sup>, David M. Lynn<sup>1</sup> and Nicholas L. Abbott<sup>1</sup>, (1)Department of Chemical & Biological Engineering, University of Wisconsin-Madison, Madison, WI, 53706, (2)Department of Chemical Engineering, Technion-Israel Institute of Technology, Haifa, Israel, 32000

**4:00 PM – 60** – Surface Light Scattering Spectroscopy: Analysis of the Measured Correlation Function by Inverse Fourier Transform of the Full Spectrum Function. Nicholas Castorano, Andrew Swisher, Daniel Wolak and **Jay A. Mann, Jr.**, Department of Chemical Engineering, Case Western Reserve University, Cleveland, OH, 44106

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**Monday, June 21, 2010, 9:40 AM – 5:00 PM**

**Self Assembly & Liquid Crystals 1**

Ballroom B, Student Union

Organizers: Oleg Lavrentovich, Elizabeth Mann, Qi-Huo Wei

Presider: Elizabeth Mann

**9:40 AM – 61 – Keynote:** Geometrical Frustration in Action – Nematics in Spherical Geometries. **Alberto Fernandez-Nieves**, School of Physics, Georgia Institute of Technology, Atlanta, GA, 30332

**10:20 AM – 62** – Ordering Transitions of Liquid Crystals Induced by Vesicles Captured at Surfaces. **Lie Na Tan**<sup>1</sup>, Paul J. Bertics<sup>2</sup> and Nicholas L. Abbott<sup>1</sup>, (1)Department of Chemical and Biological Engineering, University of Wisconsin-Madison, Madison, WI, 53706, (2)Department of Biomolecular Chemistry, University of Wisconsin-Madison, Madison, WI, 53706

**10:40 AM – 63** – Simulation Studies of Defect Textures and Dynamics in Cholesteric Droplets. **Vianney Gimenez-Pinto**, Shin-Ying Lu, Jonathan Selinger and Robin Selinger, Liquid Crystal Institute, Kent State University, Kent, OH, 44242

**11:00 AM – 64** – Thermodynamics of Sphere Packings under Different Geometries. **Guangnan Meng**<sup>1</sup>, Natalie Arkus<sup>2</sup>, Jayson Paulose<sup>1</sup>, Michael Brenner<sup>2</sup>, David R. Nelson<sup>1,2</sup> and Vinothan N. Manoharan<sup>1,2</sup>, (1)Department of Physics, Harvard University, Cambridge, MA, 02138, (2)School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, 02138

**11:20 AM – 65** – Advanced Strategies in Domains Formation of Phospholipid/Block Copolymer Hybrid Giant Unilamellar Vesicles. **Jin Nam** and T. Kyle Vanderlick, Department of Chemical Engineering, Yale University, New Haven, CT, 06511

**11:40 AM** – Lunch.

**1:20 PM – 66** – Colloidosomes with a Dissolution Trigger. Adriana San Miguel<sup>1</sup>, Jan Scrimgeour<sup>2</sup>, Jennifer

E. Curtis<sup>2</sup> and **Sven H. Behrens**<sup>1</sup>, (1)School of Chemical & Biomolecular Engineering, Georgia Institute of Technology, Atlanta, GA, 30332-0100, (2)School of Physics, Georgia Institute of Technology, Atlanta, GA, 30332

**1:40 PM – 67** – Shear-Induced Phase Separation in Polyelectrolyte/Mixed Micelle Coacervates. **Matthew W. Liberatore**<sup>1</sup>, Nicholas B. Wyatt<sup>1</sup>, MiKayla Henry<sup>1</sup>, Paul L. Dubin<sup>2</sup> and Elaine Foun<sup>2</sup>, (1)Department of Chemical Engineering, Colorado School of Mines, Golden, CO, 80401, (2)Department of Chemistry, University of Massachusetts, Amherst, MA, 01003

**2:00 PM – 68** – Shape Evolution in Lipid Vesicles: Theory and Coarse-Grained Simulation Studies. Jun Geng, Jonathan Selinger and **Robin Selinger**, Liquid Crystal Institute, Kent State University, Kent, OH, 44242

**2:20 PM – 69** – Migration of Particles by Curvature Induced Capillary Interactions. **Marcello Cavallaro**<sup>1,2</sup>, Eric P. Lewandowski<sup>1</sup>, Lorenzo Botto<sup>1</sup>, Valeria Garbin<sup>1</sup> and Kathleen J. Stebe<sup>1</sup>, (1)Chemical & Biomolecular Engineering, University of Pennsylvania, Philadelphia, PA, 19104, (2)Chemical & Biomolecular Engineering, Johns Hopkins University, Baltimore, MD, 2218

**2:40 PM – 70** – Photo-Responsive Porphyrin-Polymersome Composites. **Daniel A. Hammer**<sup>1</sup>, Michael J. Therien<sup>2</sup>, Ivan Dmochowski<sup>1</sup>, Neha Kamat<sup>1</sup>, Greg Robbins<sup>1</sup>, Misay Jimbo<sup>1</sup>, Joe Swift<sup>1</sup> and Jeff Rawson<sup>2</sup>, (1)Bioengineering, University of Pennsylvania, Philadelphia, PA, 19104, (2)Chemistry, Duke University, Durham, NC, 21108

**3:00 PM** – Break.

**3:20 PM – 181** – Macroscopic Alignment of Self-Assembled Gold Nanorods for Optical Metamaterial Applications. **Jake Fontana**<sup>1</sup>, Ashish Agarwal<sup>2</sup>, Nicholas Kotov<sup>2</sup> and Peter Palfy-Muhoray<sup>1</sup>, (1)Liquid Crystal Institute, Kent State University, Kent, OH, 44240, (2)Department of Chemical Engineering, University of Michigan, Ann Arbor, MI, 48109

**3:40 PM – 72** – Bent-Core Alignment Monolayers. **Wilder G. Iglesias**<sup>1</sup>, Antal Jakli<sup>1</sup> and Elizabeth K. Mann<sup>2</sup>, (1)Liquid Crystal Institute, Kent State University, Kent, OH, 44242, (2)Department of Physics, Kent State University, Kent, OH, 44242

**4:00 PM – 73** – Collective Molecular Motor Using Chiral Liquid Crystalline Thin Films. **Hiroshi Yokoyama**<sup>1</sup> and Yuka Tabe<sup>2</sup>, (1)Liquid Crystal Institute, Kent State University, Kent, OH, 44242, (2)Department of Applied Physics, Waseda University, Shinjuku, Tokyo, Japan, 169-8555

**4:20 PM – 74** – Effect of Ion Species on the Critical Salt Concentration of Polyelectrolyte Brush at the Air/Water Interface. **Hideki Matsuoka**, Shunichi Nakayama and Arjun Ghosh, Department of Polymer Chemistry, Kyoto University, Kyoto, Japan, 615-8510

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**4:40 PM – 75** – Smectic Liquid Crystal Films at the Air/Water Interface: Line Tension vs. Dipolar Repulsion. **Pritam Mandal**<sup>1</sup>, Andrew J. Bernoff<sup>2</sup>, J. Adin Mann<sup>3</sup>, James C. Alexander<sup>4</sup> and Elizabeth K. Mann<sup>5</sup>, (1)Department of Physics, Kent State University, Kent, OH, 44242, (2)Department of Mathematics, Harvey Mudd College, Claremont, CA, 91711, (3)Chemical Engineering, Case Western Reserve University, Cleveland, OH, 44106, (4)Department of Mathematics, Case Western Reserve University, Cleveland, OH, 44106, (5)Department of Physics, Kent State University, Kent, OH, 44242

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**Monday, June 21, 2010, 10:20 AM – 3:00 PM**

**Catalysis & Surface Science**

310, Student Union

Organizer/Presider: John Kitchin

**10:20 AM – 76** – Electrochemical Stability of Low-Density Alkanethiol SAMs on Au(111). **Mingxiang Luo** and Joelle Frechette, Department of Chemical and Biomolecular Engineering, Johns Hopkins University, Baltimore, MD, 21218

**10:40 AM – 77** – *In Situ* <sup>195</sup>Pt and <sup>13</sup>CO NMR Investigation of Pt-Covered Ru and Au Nanoparticles. **Dianne Oseno Atienza**<sup>1</sup>, In-Su Park<sup>1</sup>, Bingchen Du<sup>2</sup> and Yuye Jay Tong<sup>1</sup>, (1)Chemistry Department, Georgetown University, 37th & O St. Washington, DC, 20057, (2)US Food and Drug Administration, 10903 New Hampshire Ave. Silver Spring, MD, 20993

**11:00 AM – 78** – An In-Situ Surface Enhanced IR Spectroscopic Investigation of Poly (Vinylpyrrolidone) on Pt Nanoparticles. **Augusta Hofstead-Duffy**, Dejun Chen and YuYe Tong, Department of Chemistry, Georgetown University, Washington, DC, 20057-0001

**11:20 AM – 79** – Imaging Amperometry: Single Particle Experiments and Theory. **Christopher L. Wirth**, Paul J. Sides and Dennis C. Prieve, Department of Chemical Engineering and Center for Complex Fluids Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213

**11:40 AM** – Lunch.

**1:20 PM – 80** – A Hierarchical Methanation Catalyst System Based on Foam, CNTs and Ru Nanoparticles. **Randy L. Vander Wal**, Jane Hitomi Fujiyama-Novak and Chung-Hsuan Hunag, Penn State University, University Park, PA, 16802

**1:40 PM – 81** – Very Slow Surfactant Adsorption at the Solid–Liquid Interface Is Due to Long Lived Surface Aggregates. **Shaun C. Howard** and Vincent S. J. Craig, Department of Applied Mathematics, The Australian National University, Canberra, ACT, Australia, 0200

**2:00 PM – 82** – Poly(lactic Acid) Brushes as Responsive Surfaces. **Lebo Xu** and Chris Gorman, Department of Chemistry, North Carolina State University, Raleigh, NC, 27695

**2:20 PM – 83** – Photoelectrocatalytic Properties of Photosystem I Multilayer Assemblies. **Peter N. Ciesielski**<sup>1,2,4</sup>, Justin Gregory<sup>1,3</sup>, Matt Irwin<sup>2</sup>, David Cliffler<sup>4</sup>, Norman Tolk<sup>3</sup> and Kane Jennings<sup>2</sup>, (1)Interdisciplinary Materials Science Program, Vanderbilt University, Nashville, TN, 37203, (2)Department of Chemical and Biomolecular Engineering, Vanderbilt University, Nashville, TN, 37203, (3)Department of Physics and Astronomy, Vanderbilt University, Nashville, TN, 37203, (4)Department of Chemistry, Vanderbilt University, Nashville, TN, 37203

**2:40 PM – 84** – Charge Localization in Isolated Mixed-Valence Complexes: An STM and Theoretical Study. **Yuhui Lu**, Natalie Wasio, Rebecca Quardokus and S. Alex Kandel, Department of Chemistry and Biochemistry, University of Notre Dame

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**Monday, June 21, 2010, 1:20 PM – 3:00 PM**

**Chemistry of Colloidal Materials 1**

314, Student Union

Organizers/Presiders: Paschalis Alexandridis, James Schneider

**1:20 PM – 85 – Keynote:** Self-Organization of Nanoscale Colloids. **Nicholas A. Kotov**, Department of Biomedical Engineering, University of Michigan, Ann Arbor, MI

**2:00 PM – 86** – Synthesis and Immobilization of Nanoparticles as Nano-Seeds To Induce and Confine Molecular Crystallization. **Sunxi Wang**, Li Li and Guangzhao Mao, Department of Chemical Engineering and Materials Science, Wayne State University, Detroit, MI, 48202

**2:20 PM – 87** – One-Pot Synthesis of PEG-Coated Ultra-Small Gadolinium Oxide Nanoparticles. **Luc Faucher**<sup>1,2,3</sup> and Marc-André Fortin<sup>1,2,3</sup>, (1)Axe Métabolisme, Santé Vasculaire et Rénale (AMSVR-CHUQ), Centre Hospitalier Universitaire de Québec, Québec City, QC, Canada, G1L 3L5, (2)Centre de Recherche sur les Matériaux Avancés (CERMA), Québec City, QC, Canada, G1V 0A6, (3)Department of Engineering Materials, Université Laval, Québec City, QC, Canada, G1V 0A6

**2:40 PM – 88** – Ammonia- or Amine-Catalyzed Synthesis of Uniform-Sized Silica Nanospheres and Their Self-Assembly. **Junzheng Wang**, Masashi Fukao, Ayae Sugawara, Atsushi Shimojima and Tatsuya Okubo, Department of Chemical System Engineering, The University of Tokyo, Tokyo, Japan, 113-8656

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**Monday, June 21, 2010, 5:30 PM – 7:30 PM**

**Poster Session**

Ballroom A, Student Union

Organizers: H. Michael Cheung, Anastasia Morfesis

Presider: Anastasia Morfesis

**89** – Effect of surface modification on phase transition temperature. **Clifton C. Watkins**, David E. Nikles and Shane C. Street, Department of Chemistry, The University of Alabama, Tuscaloosa, AL, 35487

**90** – Structural and Rheological Evolution of Particulate Gels. **Xiujuan Cao**, Herman Cummins and Jeff Morris, Chemical Engineering, The City College of New York, Graduate Center, New York, NY, 10031

**91** – Probing Porosity and Pore Interconnectivity in Self-Assembled TiO<sub>2</sub>-Graphene Hybrid Nanostructures Using Hyperpolarized <sup>129</sup>Xe NMR. **Li-Qiong Wang**<sup>1</sup>, Donghai Wang<sup>2</sup>, Jun Liu<sup>2</sup> and Gregory J. Exarhos<sup>2</sup>, (1)Chemistry, Brown University, Providence, RI, 02912, (2)Fundamental Science, Pacific Northwest National Laboratory, Richland, WA, 99354

**92** – Stirring and Mixing for Chemists: Practical Control Methods. **Ingo H. Leubner**, Department of Research, Crystallization Consulting, Pen, NY, 14526

**93** – Altering the Wettability of Bitumen-Treated Glass Surfaces with Anionic and Cationic Surfactants. Weikang Liu<sup>1</sup>, Ying Jin<sup>2</sup>, **Xiaoli Tan**<sup>3</sup> and Anthony Yeung<sup>3</sup>, (1)Department of Chemical Engineering and Technology, State Key Laboratory of Heavy Oil Processing, China University of Petroleum, Beijing, China, 102249, (2)Department of Chemical Engineering, School of Chemical Engineering and Technology, Tianjin University, Tianjin, China, 300072, (3)Department of Chemical and Materials Engineering, University of Alberta, Edmonton, AB, Canada, T6G 2V4

**94** – Size Distribution Measurement of Nanoparticles Synthesized by Continuous Hydrothermal Synthesis: Using Dynamic Light Scattering. Fraser McNeil-Watson<sup>1</sup>, **Ana Morfesis**<sup>1</sup>, Robert Guarr<sup>2</sup>, Christopher Tighe<sup>2</sup> and Jawwad Darr<sup>2</sup>, (1)Malvern Instruments Ltd., Malvern, Worcestershire, United Kingdom, WR14 1XZ, (2)Department of Chemistry, University College London, London, United Kingdom, WC1H 0AJ

**95** – Effects of Surfactants on Mucin Rheology. Austin L. Good<sup>1,2</sup>, **Amsul Khanal**<sup>1</sup>, Stephen Garoff<sup>3</sup>, Todd Przybycien<sup>1,2</sup> and Robert D. Tilton<sup>1,2</sup>, (1)Department of Biomedical Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213, (2)Department of Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213, (3)Department of Physics, Carnegie Mellon University, Pittsburgh, PA, 15213

**96** – Predicting Attachment Efficiency of Colloid Deposition under Unfavorable Attachment Conditions. **Chongyang Shen**<sup>1</sup>, Yuanfang Huang<sup>1</sup>, Baoguo Li<sup>1</sup> and Yan Jin<sup>2</sup>, (1)Department of Soil and Water Sciences, China Agricultural University, Beijing, China, 100094,

(2)Department of Plant and Soil Sciences, University of Delaware, Newark, DE, 19716

**97** – Acoustic Spectroscopy for Gel Trapped Colloids. **Prasad S. Bhosale** and John C. Berg, Department of Chemical Engineering, University of Washington, Seattle, WA

**98** – How Small Changes in Chitosan Structure Vastly Affect Micro- and Nanoparticle Formation. **Yan Huang** and Yakov Lapitsky, Department of Chemical and Environmental Engineering, University of Toledo, Toledo, OH, 43606

**99** – Modeling of Solute Transport in Biomimetic Solar and Fuel Cells with Soft Matter Microfluidic Networks. **Hyung-Jun Koo** and Orlin D. Velev, Department of Chemical and Biomolecular Engineering, North Carolina State University, Raleigh, NC, 27695

**100** – Impact of Polydispersity on Nanoparticle Haloing. **Lynn M. Walker**<sup>1</sup>, Dennis C. Prieve<sup>1</sup>, Hsin-Chen Chung<sup>1</sup>, Phuoc X. Tran<sup>3</sup>, Yee Soong<sup>3</sup> and Rakesh K. Gupta<sup>2</sup>, (1)Department of Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213, (2)Department of Chemical Engineering, West Virginia University, Morgantown, WV, 26506, (3)National Energy Technology Laboratory, Pittsburgh, PA, 15236-0940

**101** – Connecting Surface Dilatational Rheology with Surfactant Diffusion to and from the Air-Liquid Interface. **Matthew D. Reichert**<sup>1</sup>, Nicolas J. Alvarez<sup>1</sup>, Carlton F. Brooks<sup>2</sup>, Anne M. Grillet<sup>2</sup>, Lisa A. Mondy<sup>2</sup> and Lynn M. Walker<sup>1</sup>, (1)Department of Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213, (2)Sandia National Laboratories, Albuquerque, NM, 87123

**102** – Optical Properties of Periodic Structures in Submicron Films of Hybrid Aligned Nematic Liquid Crystal. **Volodymyr Borshch** and Oleg D. Lavrentovich, Liquid Crystal Institute and Chemical Physics Interdisciplinary Program, Kent State University, Kent, OH, 44242

**103** – Grafting Polyethylene Glycol (PEG) on Gadolinium Oxide Nanoparticles and Thin Films: Comparison of mPEG-Silane, mPEG-Phosphate and mPEG-Diacid. **Andrée-Anne Guay-Bégin**<sup>1,2,3</sup>, Luc Faucher<sup>1,2,3</sup>, Pascale Chevallier<sup>1,2</sup>, Stéphane Turgeon<sup>1,2</sup> and Marc-André Fortin<sup>1,2,3</sup>, (1)Axe Métabolisme, Santé Vasculaire et Rénale, Centre Hospitalier Universitaire de Québec (AMSVR-CHUQ), Québec City, QC, Canada, G1L 3L5, (2)Centre de Recherche sur les Matériaux Avancés (CERMA), Québec City, QC, Canada, G1V 0A6, (3)Department of Engineering Materials, Université Laval, Québec City, QC, Canada, G1V 0A6

**104** – Understanding the Effects of Protein Conjugation with Poly(ethylene Glycol) at Oil-Water Interfaces. **Adam L. Canady**<sup>1</sup>, Sheetal S. Pai<sup>1</sup>, Todd M. Przybycien<sup>1,2</sup> and Robert D. Tilton<sup>1,2</sup>, (1)Department of Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213, (2)Department of Biomedical

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Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213

**105** – HER2/neu Antibody Conjugated Poly(amino Acid)-Coated Iron Oxide Nanoparticles for Breast Cancer MR Imaging. **Hee-Man Yang**, Chan Woo Park, Won Hi Hong and Jong-Duk Kim, Department of Chemical and Biomolecular Engineering (BK21 Graduate), Korea Advanced Institute of Science and Technology, Daejeon, Chungnam-do, Republic of Korea, 305-701

**106** – Real Time Analysis of Polymer Surfaces and Their Interactions with Biomolecules Using the Quartz Crystal Microbalance with Dissipation Monitoring (QCM-D) Technology. **Stephen L. Hussey**, Biolin Scientific, Linthicum Heights, MD, 21090

**107** – Scanning Tunneling Microscopy for Studying Gas-Surface Chemical Reactions. **Matthew M. Jobbins**, Natalie A. Kautz and S. Alex Kandel, Department of Chemistry and Biochemistry, University of Notre Dame, Notre Dame, IN, 46556

**108** – Effect of Single Modifications on Dinuclear Organometallic Molecules. **Natalie A. Wasio**, Rebecca C. Quardokus, Yuhui Lu and S. Alex Kandel, Department of Chemistry and Biochemistry, University of Notre Dame

**109** – Octanethiol Self-Assembled Monolayer Reactivity Is Dependent upon Local Surface Environment. **Natalie A. Kautz** and S. Alex Kandel, Department of Chemistry and Biochemistry, University of Notre Dame, Notre Dame, IN, 46556

**110** – STM Studies of Sequentially-Adsorbed Mixed Monolayers on Au(111). **Annette F. Raigoza**, D. Andres Villalba, Natalie A. Kautz and S. Alex Kandel, Department of Chemistry & Biochemistry, University of Notre Dame, Notre Dame, IN, 46556

**111** – Scanning Tunneling Microscopy Study Comparing Neutral and Mixed-Valence Dinuclear Organometallic Molecules. **Rebecca C. Quardokus**, Yuhui Lu, Natalie A. Wasio and S. Alex Kandel, Department of Chemistry and Biochemistry, University of Notre Dame, Notre Dame, IN, 46556

**112** – Measurement of the Changes in the Shape and Permeability of Tethered Liposome Layers under Challenge from an Antimicrobial Peptide. **Mark Poggi**<sup>1</sup>, Jonathan Popplewell<sup>2</sup>, Marcus J. Swann<sup>2</sup>, M. Branden<sup>3</sup> and P. Barrett<sup>4</sup>, (1)Biolin Scientific, Linthicum Heights, MD, 21090, (2)Farfield House, Southmere Court, Electra Way, Crewe Business Park, Farfield Group, Crewe, United Kingdom, CW1 6GU, (3)Stena Center 1B, Layer Lab, Gothenberg, Sweden, S-412 92, (4)PO Box 1005, ATA Scientific, Sutherland, Australia, NSW 1499

**113** – Investigating Packing Order of Janus Particle Monolayers. **Francisco Guzman**<sup>1,2</sup>, Emily Cranston<sup>2</sup>, Mark Rutland<sup>2</sup> and Ilona Kretschmar<sup>1</sup>, (1)Department of Chemical Engineering, City College of New York, (2)Department of Surface Chemistry and Corrosion Science, Royal Institute of Technology, Sweden

**114** – Stable Amorphous Blue Phase of Bent-Core Nematic Liquid Crystals Doped with a Chiral Material. **Stefanie Taushanoff**<sup>1</sup>, Khoa V. Le<sup>2</sup>, Jarrod Williams<sup>3</sup>, Robert J. Twieg<sup>3</sup>, B. K. Sadashiva<sup>4</sup>, Hideo Takezoe<sup>2</sup> and Antal Jakli<sup>1</sup>, (1)Chemical Physics Interdisciplinary Program & Liquid Crystal Institute, Kent State University, Kent, OH, 44242, (2)Department of Organic and Polymeric Materials, Tokyo Institute of Technology, Tokyo, Okayama, Japan, 152-8552, (3)Department of Chemistry, Kent State University, Kent, OH, 44242, (4)Raman Research Institute, Sadashivanagar, Bangalore, India, 560080

**115** – Effects of Solid Surface Hydrophobicity on Initial Bacterial Attachment under Slow Flow. **Hua Wang**, Maysam Sodagari, Yajie Chen, Bi-min Zhang Newby and Lu-Kwang Ju, Department of Chemical and Biomolecular Engineering, The University of Akron, Akron, OH, 44325

**116** – Liquid Crystalline Properties of g8p, the Major Coat Protein of *fd* Bacteriophage. **Steven Fiester**<sup>1</sup>, Antal Jakli<sup>2</sup> and Christopher Woolverton<sup>3</sup>, (1)Department of Biological Sciences, Kent State University, Kent, OH, 44242, (2)Liquid Crystal Institute and Chemical Physics Interdisciplinary Program, Kent State University, Kent, OH, 44242, (3)College of Public Health, Kent State University, Kent, OH, 44242

**117** – Modeling Smectic Layers in Confined Domains. **Mikhail Pevnyi** and Jonathan V. Selinger, Liquid Crystal Institute, Kent State University, Kent, OH, 44242

**118** – Scattering Free Stressed Liquid Crystals in the Visible and Near Infrared Spectral Range. **Hari Atkuri**, Ke Zhang and John West, Liquid Crystal Institute, Kent State University, Kent, OH, 44242

**119** – Crystallography and Nucleation on Spherical Surfaces. **Guangnan Meng**<sup>1</sup>, Jayson Paulose<sup>1</sup>, David R. Nelson<sup>1,2</sup> and Vinothan N. Manoharan<sup>1,2</sup>, (1)Department of Physics, Harvard University, Cambridge, MA, 02138, (2)School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, 02138

**120** – Functionalized Surfaces as Templates for *In Situ* Generation of Metal Nanoparticle Assemblies. **Amy Bondy**, Thomas Chase, Mrissa Kerrigan and Krisanu Bandyopadhyay, Department of Natural Sciences, University of Michigan-Dearborn, Dearborn, MI, 48128

**123** – Effects of Biofilm on the Transport of Iron Nanoparticles in a Simulated Subsurface Environment. **Robert N. Lerner** and Yang Liu, Civil and Environmental Engineering, University of Alberta, Edmonton, AB, Canada, T6G 2W2

**124** – Remediation of Persistent Pollutants Using Magnetic Permanently Confined Micelle Arrays in Sediments, Clays, and Natural Colloids. **Kristin K. Clark** and Arturo A. Keller, Bren School of Environmental Science and Management, University of California, Santa Barbara, Santa Barbara, CA, 93106

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**125** – Diacylglycerol Pyrophosphate, Membrane and Interfacial Properties of an Unusual Plant Lipid. **Liza Rice**<sup>1</sup>, Amy Babb<sup>2</sup> and Edgar E. Kooijman<sup>3</sup>, (1)Biotechnology Program, Kent State University, Kent, OH, 44242, (2)Department of Chemistry, Kent State University, Kent, OH, 44242, (3)Department of Biological Sciences, Kent State University, Kent, OH, 44242

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**Tuesday, June 22, 2010, 8:30 AM – 9:20 AM**

**Plenary 2**

Ballroom A, Student Union

Organizer/President: J. Adin Mann, Jr.

**8:30 AM – 126** – Janus Colloids: Puzzles and Opportunities. **Steve Granick**, Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign

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**Tuesday, June 22, 2010, 9:40 AM – 11:40 AM**

**Chemistry of Colloidal Materials 2**

314, Student Union

Organizers/Presiders: Paschalis Alexandridis, James Schneider

**9:40 AM – 127 – Keynote:** Efficient and Thermally Responsive Emulsification Using Nanoparticle-Grafted Polymer Brushes. **Robert D. Tilton**, Department of Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA

**10:20 AM – 128** – pH Responsiveness of Polyelectrolyte Dendrimers: A Dynamical Perspective. **Xin Li**<sup>1,2</sup>, Wei-Ren Chen<sup>1</sup>, Emily Liu<sup>2</sup>, Kunlun Hong<sup>3</sup>, Kenneth W. Herwig<sup>1</sup>, Yun Liu<sup>4</sup> and Gregory S. Smith<sup>1</sup>, (1)Neutron Scattering Science Division, Oak Ridge National Lab, Oak Ridge, TN, 37831, (2)Mechanical Aerospace and Nuclear Engineering, Rensselaer Polytechnic Institute, Troy, NY, 12180, (3)Center for Nanophase Materials Sciences, Oak Ridge National Lab, Oak Ridge, TN, 37831, (4)NIST Center for Neutron Research, National Institute of Standards and Technology, Gaithersburg, MD, 20899

**10:40 AM – 129** – Effect of Mixed Initiator Monolayers on the ATRP of Polystyrene from Silica Nanoparticle Surfaces. **Daniel Sunday** and David L. Green, Chemical Engineering, University of Virginia, Charlottesville, VA, 22904

**11:00 AM – 130** – Microparticles with Hierarchical Nanoporosity Derived by Microemulsion and Micelle Templating. **Nick J. Carroll**, Svitlana Pylypenko, Plamen B. Atanassov and Dimiter N. Petsev, Department of Chemical and Nuclear Engineering, University of New Mexico, Albuquerque, NM, 87131

**11:20 AM – 131** – Synthesis and Chain Length Effect on Sizes of Alkaneselenolate-Protected Gold Nanoparticles. **Oksana Zaluzhna**<sup>1</sup>, Ying Li<sup>1</sup>, Chris Zangmeister<sup>2</sup> and Yu Ye J. Tong<sup>1</sup>, (1)Department of Chemistry, Georgetown University, Washington, DC, 20057, (2)Process Measurements Division, National Institute of Standards and Technology, Gaithersburg, MD, 20899

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**Tuesday, June 22, 2010, 9:40 AM – 5:00 PM**

**General Papers 2**

312, Student Union

Organizers: Michael Bevan, Joelle Frechette

Presiders: Shelley Anna, Joelle Frechette, Daeyeon Lee

**9:40 AM – 132 – Keynote:** Rule for Creating Complex Nanoparticles by Controlling Kinetics. **Robert Prud'homme**, Department of Chemical Engineering, Princeton University, Princeton, NJ

**10:20 AM – 133** – Precision Control of Crystal Nucleation and Crystal Size. **Ingo H. Leubner**, Department of Research, Crystallization Consulting, Penfield, NY, 14526-2411

**10:40 AM – 134** – Foam-Templated Functional Particles. **Kosta Ladavac**<sup>1</sup>, Rodrigo E. Guerra<sup>2</sup>, David M. Kaz<sup>2</sup>, Sebastian Koltzenburg<sup>3</sup> and Vinothan N. Manoharan<sup>1,2</sup>, (1)School of Engineering and Applied Sciences, Harvard University, Cambridge, MA, 02138, (2)Department of Physics, Harvard University, Cambridge, MA, 02138, (3)Polymer Research Division, BASF SE, Germany

**11:00 AM – 135** – Colloidal Bijels as Templates for Novel Bicontinuous Composites. Matthew N. Lee and **Ali Mohraz**, Department of Chemical Engineering & Materials Science, University of California, Irvine, Irvine, CA, 92697

**11:20 AM – 136** – Ion-Pair Interactions To Control the Assembly of Nanoparticles. Gloria K. Olivier and **Joelle Frechette**, Chemical and Biomolecular Engineering, Johns Hopkins University, Baltimore, MD, 21210

**11:40 AM** – Lunch Break.

**1:20 PM – 137** – When Sessile Drops Are No Longer Small: Transitions from Spherical to Fully Flattened. **C. W. Extrand** and Sung In Moon, Entegris, Chaska, MN, 55318

**1:40 PM – 138** – Chasing Drops: Following Escaper and Pursuer Drop Couple System. **Priyanka S. Wasnik** and Rafael Tadmor, Chemical Engineering, Lamar University, Beaumont, TX, 77710

**2:00 PM – 139** – Spreading and Retraction as a Function of Drop Size. **Moniraj Ghosh**<sup>1</sup> and Kathleen J. Stebe<sup>2</sup>, (1)Chemical and Biomolecular Engineering, Johns Hopkins University, Baltimore, MD, 21218, (2)Chemical and Biomolecular Engineering, University of Pennsylvania, Philadelphia, PA, 19104

**2:20 PM – 140** – Effect of Superhydrophobicity on Ion Transfer. **Juan Carlos Tuberquia**, Nabijan Nizamidin and G. Kane Jennings, Chemical and Biomolecular Engineering, Vanderbilt University, Nashville, TN, 37235

**2:40 PM – 141** – Relationship between Contact Angle Hysteresis and Electrowetting on Dielectric. Rohini Gupta, Teno Boone, Danica Sheth and **Joelle Frechette**, Johns Hopkins University

**3:00 PM** – Break.

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**3:20 PM – 142** – Role of Surfactant Mass Transport in the Formation of Microscale Droplets. **Wingki Lee<sup>1</sup>**, **Nicolas J. Alvarez<sup>1</sup>**, **Lynn M. Walker<sup>1</sup>** and **Shelley L. Anna<sup>1,2</sup>**, (1)Department of Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213, (2)Department of Mechanical Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213

**3:40 PM – 143** – Characterization of the Hydrophilic-Lipophilic Nature of Silicone Oils and Surfactants Via the Hydrophilic-Lipophilic Difference (HLD) Framework. **Victor Castellino**, **Yi Guo**, **Yu-Ling Cheng** and **Edgar Acosta**, Department of Chemical Engineering and Applied Chemistry, University of Toronto, Canada

**4:00 PM – 144** – Influence of Normal Force on the Lateral Force at the Interface between a Liquid Drop and a Surface. **Rafael Tadmor**, **Dan F. Smith** Dept. of Chemical Engineering, Lamar University, Beaumonts, TX, 77706

**4:20 PM – 145** – A Comparison of Nonionic Surfactant Dynamics at the Oil-Water and the Air-Water Interface. **Nicolas J. Alvarez<sup>1</sup>**, **Lynn M. Walker<sup>1</sup>** and **Shelley L. Anna<sup>1,2</sup>**, (1)Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213, (2)Mechanical Engineering Department, Carnegie Mellon University, Pittsburgh, PA, 15213

**4:40 PM – 146** – Range of Validity of Drop Shape Techniques for Surface Tension Measurement. **Sameh M. I. Saad<sup>1</sup>**, **Zdenka Policova<sup>1</sup>**, **Edgar J. Acosta<sup>1,2</sup>** and **A. Wilhelm Neumann<sup>1</sup>**, (1)Department of Mechanical and Industrial Engineering, University of Toronto, Toronto, ON, Canada, M5S3G8, (2)Department of Chemical Engineering and Applied Chemistry, University of Toronto, Toronto, ON, Canada, M5S3E5

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**Tuesday, June 22, 2010, 9:40 AM – 5:00 PM**  
**Nano and Colloidal Materials: Environmental Applications and Implications**

Ballroom C, Student Union

Organizers/Presiders: Kenya Crosson, Sharon Walker

**9:40 AM – 147 – Keynote:** Nanoparticle Binding Induces Size and Surface-Dependent Restructuring in Biological Membranes. **Geoffrey D. Bothun**, **Yanjing Chen**, **Julia Roder-Hanna** and **Arijit Bose**, Department of Chemical Engineering, University of Rhode Island, Kingston, RI, 02881

**10:20 AM – 148** – Aggregation and Deposition of Titanium Dioxide (TiO<sub>2</sub>) Nanoparticles as a Function of Environmental Conditions. **Beng Joo Thio**, **Arturo Keller**, **Dongxu Zhou** and **Chia Hung Hou**, Bren School of Environmental Science and Management, University of California, Santa Barbara, Santa Barbara, CA, 93106

**10:40 AM – 149** – Novel Microscope-Based Study on Deposition and Attachment Kinetics of TiO<sub>2</sub> Nanoparticles on Surfaces: Fundamental Mechanisms and Implications. **Indranil Chowdhury** and **Sharon L.**

**Walker**, Department of Chemical and Environmental Engineering, University of California, Riverside, Riverside, CA, 92521

**11:00 AM – 150** – NOM and Polymeric Coatings Impact on the Bactericidal Effects of TiO<sub>2</sub> Nanoparticles to *Escherichia coli*. **Zhiqiang Li**, **Gregory V. Lowry** and **Kelvin B. Gregory**, Department of Civil and Environmental Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213

**11:20 AM – 151** – Assessment of Aggregation and Transport in Porous Media of Carboxymethyl Cellulose-Modified Zero-Valent Iron Nanoparticles. **Trishikhi Raychoudhury<sup>1</sup>**, **Nathalie Tufenkji<sup>2</sup>** and **Subhasis Ghoshal<sup>1</sup>**, (1)Department of Civil Engineering, McGill University, Montreal, QC, Canada, H3A 2K6, (2)Department of Chemical Engineering, McGill University, Montreal, QC, Canada, H3A 2B2

**11:40 AM** – Lunch.

**1:20 PM – 152** – Environmental Remediation of Chlorinated Hydrocarbons Using Multifunctional Nanoparticles with Optimal Reactive/Adsorptive/Transport Characteristics. **Vijay T. John**, **Jingjing Zhan** and **Bhanukiran Sunkara**, Chemical and Biomolecular Engineering, Tulane University, New Orleans, LA, 70118

**1:40 PM – 153** – Rheological Control of Fe<sub>2</sub>O<sub>3</sub>/Al(OH)<sub>3</sub>-Rich Colloidal Slurries under High Ionic Strength and pH: Implication to U.S. DOE Waste Treatment Plants. **Jaehun Chun<sup>1</sup>**, **Adam Poloski<sup>1</sup>**, **Paul Bredt<sup>1</sup>** and **Erich Hansen<sup>2</sup>**, (1)Pacific Northwest National Laboratory, Richland, WA, 99352, (2)Savannah River National Laboratory, Aiken, SC, 29808

**2:00 PM – 154** – Zero-Valent Iron Nanoparticles (nZVI) Suspensions with Anionic Surfactants. **Ziheng Wang**, Department of Chemical Engineering and Applied Chemistry, University of Toronto, Toronto, ON, Canada, M5S3E5

**2:20 PM – 155** – Effect of Stabilizer Properties on Nanoparticle Attachment in Chemically Heterogeneous Porous Media Surfaces. **Jee Eun Song<sup>1</sup>**, **Tanapon Phenrat<sup>1</sup>**, **Robert Tilton<sup>2,3</sup>** and **Greg Lowry<sup>1</sup>**, (1)Department of Civil and Environmental Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213, (2)Department of Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213, (3)Department of Biomedical Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213

**2:40 PM – 232** – Physicochemical properties of nanoparticles and their toxicity. **P. Somasundaran** and **Xiaohua Fang**, Langmuir Center for Colloids and Interfaces, Columbia University, New York, USA, 10027

**3:00 PM** – Break.

**3:20 PM – 156** – Application of Molecular Biology Techniques for Analyzing the Effects of Nano-Silver on Wastewater Biofilms. **Zhiya Sheng** and **Yang Liu**,

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Department of Civil and Environmental Engineering,  
University of Alberta, Edmonton, AB, Canada, T6G 2W2

**3:40 PM – 157** – Interfacial Behavior of RNA-Free MS2 Bacteriophage Particles. **Nickolas Easter**<sup>1</sup>, Leonardo Gutierrez<sup>1</sup>, Steve Mylon<sup>2</sup> and Thanh H. Nguyen<sup>1</sup>, (1)Department of Civil and Environmental Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, 61801, (2)Department of Chemistry, Lafayette College, Easton, PA, 18042

**4:00 PM – 158** – Microscopic Recognition of Multi-Walled Carbon Nanotubes Using Kelvin Probe Force Microscopy. **Qiang Yu** and Chongzheng Na, Department of Civil Engineering and Geological Sciences, University of Notre Dame, Notre Dame, IN, 46556

**4:20 PM – 159** – Construction of Stimuli-Responsive Host:Guest Polymer Micelles from Amino-b-Cyclodextrin and Poly(ethylene Glycol)-Poly(vinyl Alcohol)-Adamantanate Complexes. **Wei Deng**<sup>1</sup>, Jing Chen<sup>2</sup> and David H. Thompson<sup>1</sup>, (1)Departments of Chemistry and Biomedical Engineering, Purdue University, W. Lafayette, IN, 47906, (2)Department of Chemistry and Biotechnology, University of Tokyo, Tokyo, Japan, 153-8904

**4:40 PM – 160** – Electrophoretic Deposition of Unstable Colloidal Suspensions for Superhydrophobic Surfaces. Youngsoo Joung and **Cullen R. Buie**, Department of Mechanical Engineering, Massachusetts Institute of Technology, Cambridge, MA, 02139

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**Tuesday, June 22, 2010, 9:40 AM – 2:20 PM**

**Physics of Colloids 2**

316, Student Union

Organizers: Raymond Dagastine, Daniel Lacks  
Presider: Mohammad Islam

**9:40 AM – 161 – Keynote:** Lubrication Forces between a Solid Plate and Particle in Air and Liquids. **William Ducker**<sup>1</sup>, Adam Bowles<sup>1</sup>, Chris Honig<sup>1</sup>, John Sader<sup>2</sup> and Paul Mulvaney<sup>3</sup>, (1)Department of Chemical Engineering, Virginia Tech, Blacksburg, VA, 24061, (2)Department of Mathematics, University of Melbourne, Melbourne, Victoria, Australia, 3010, (3)School of Chemistry, University of Melbourne, Melbourne, Victoria, Australia, 3010

**10:20 AM – 162** – Experimental Studies of the Brownian Dynamics of Boomerang Colloidal Particles. **Ayan Chakrabarty**, Feng Wang, Bhuwan Joshi and Qi-Huo Wei, Liquid Crystal Institute, Kent State University, Kent, OH, 44242

**10:40 AM – 163** – Axial Rotational Diffusion of a DNA-Linked Colloidal Rod. **Dichuan Li** and Sibani Lisa Biswal, Department of Chemical and Biomolecular Engineering, Rice University, Houston, TX, 77005

**11:00 AM – 164** – Brownian Dynamics of Emulsion Film Formation and Droplet Coalescence. **Dimitar N. Petsev** and Jhoan O. Toro-Mendoza, Department of Chemical

and Nuclear Engineering, University of New Mexico, Albuquerque, NM, 87113

**11:20 AM – 165** – Visualization of Collisions and Coalescence of Micro-Bubbles Using Atomic Force Microscopy. Ivan Vakarelski<sup>1,2</sup>, Rogerio Manica<sup>3</sup>, Geoffrey Stevens<sup>1</sup>, Franz Grieser<sup>1</sup>, Derek Chan<sup>1</sup> and **Raymond Dagastine**<sup>1</sup>, (1)The Particulate Fluids Processing Centre, The University of Melbourne, Melbourne, Victoria, Australia, 3010, (2)Institute of Chemical and Engineering Sciences, Singapore, (3)Institute of High Performance Computing, Singapore

**11:40 AM** – Lunch.

**1:20 PM – 166** – Electrostatic Interactions at the Oil-Water Interface: Pairwise Heterogeneity and Additivity. **Eric M. Furst** and Bum Jun Park, Department of Chemical Engineering, University of Delaware, Newark, DE, 19123

**1:40 PM – 167** – Effect of Particle and Surfactant Chemistry on Charging of Colloids in Apolar Media. **Saran Poovarodom** and John C. Berg, Department of Chemical Engineering, University of Washington, Seattle, WA, 98195

**2:00 PM – 168** – Conductivity, Surface Charge, and Electrostatic Interaction in Nonpolar Liquids Mediated by Non-Ionizable Surfactants. Qiong Guo, Carlos E. Espinosa, Virendra Singh and **Sven H. Behrens**, School of Chemical & Biomolecular Engineering, Georgia Institute of Technology, Atlanta, GA, 30332-0100

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**Tuesday, June 22, 2010, 9:40 AM – 5:00 PM**

**Self Assembly & Liquid Crystals 2**

Ballroom B, Student Union

Organizers: Oleg Lavrentovich, Elizabeth Mann, Qi-Huo Wei

Presider: Oleg Lavrentovich

**9:40 AM – 169 – Keynote:** Chromonic Liquid Crystals: Self-Assembly Not Driven by the Hydrophobic Effect.

**Gordon J. T. Tiddy**, School of Chemical Engineering & Analytical Science, University of Manchester, Manchester, United Kingdom, M60 1QD

**10:20 AM – 170** – Nonamphiphilic Colloidal Chemistry – A New Understanding of a 39-Year-Old Liquid Crystal System. **Yan-Yeung Luk**<sup>1</sup>, Lei Wu<sup>1</sup>, Jyotsna Lal<sup>2</sup> and Karen Simon<sup>1</sup>, (1)Chemistry, Syracuse University, Syracuse, NY, 13244, (2)Argonne National Laboratory, Argonne, IL, 60439

**10:40 AM – 171** – Self-Assembly of Lyotropic Chromonic Liquid Crystal Disodium Cromoglycate in Crowded Solutions. **Oleg D. Lavrentovich**<sup>1,2</sup>, Luana Tortora<sup>1</sup>, Heung-Shik Park<sup>1,2</sup>, Shin-Woong Kang<sup>3,4</sup>, Seung Ho Hong<sup>3</sup>, Konstantine Kaznacheev<sup>5</sup>, Daniele Finotello<sup>6</sup>, Samuel Sprunt<sup>3</sup> and Satyendra Kumar<sup>3</sup>, (1)Liquid Crystal Institute, Kent State University, Kent, OH, 44242, (2)Chemical Physics Interdisciplinary Program, Kent State

University, Kent, OH, 44242, (3)Department of Physics, Kent State University, Kent, OH, 44242, (4)Department of BIN Fusion Technology, Chonbuk National University, Jeonju, Republic of Korea, 561-756, (5)NLSII Project, Brookhaven National Laboratory, Upton, NY, 11973, (6)Division of Materials Research, National Science Foundation, Arlington, VA, 22230

**11:00 AM – 172** – Surface Alignment and Anchoring Transitions in Nematic Lyotropic Chromonic Liquid Crystal. **Yuriy Nastishin**<sup>1,2</sup>, Heung-Shik Park<sup>1</sup>, Olexandr Boiko<sup>1,3</sup>, Olexandr Brodyn<sup>3</sup>, Myroslava Omelchenko<sup>1</sup>, Luana Tortora<sup>1</sup>, Vassili Nazarenko<sup>3</sup> and Oleg Lavrentovich<sup>1</sup>, (1)Liquid Crystal Institute and Chemical Physics Interdisciplinary Program, Kent State University, Kent, OH, 44242, (2)Department of Parametric Crystallooptics, Institute of Physical Optics, Lviv, Ukraine, 79005, (3)Molecular Photoelectronics, Institute of Physics, Kiev, Ukraine, 03039

**11:20 AM – 173** – Poly(ethylene Glycol) Induced Condensation of Lyotropic Chromonic Liquid Crystal Anionic Monoazo Dye Sunset Yellow. **Heung-Shik Park**<sup>1</sup>, Luana Tortora<sup>1</sup>, Shin-Woong Kang<sup>2,3</sup>, Satyendra Kumar<sup>1,3</sup> and Oleg D. Lavrentovich<sup>1</sup>, (1)Liquid Crystal Institute and Chemical Physics Interdisciplinary Program, Kent State University, Kent, OH, 44242, (2)Department of BIN Fusion Technology, Chonbuk National University, Jeonju, Republic of Korea, 561-756, (3)Department of Physics, Kent State University, Kent, OH, 44242

**11:40 AM** – Lunch.

**1:20 PM – 174** – Characterization of the Reversible Interaction of Pairs of Nanoparticles Dispersed in Nematic Liquid Crystals. **Daniel Abras**, Gary Koenig, Gaurav Pranami, Juan J. de Pablo and Nicholas L. Abbott, Department of Chemical and Biological Engineering, University of Wisconsin-Madison, Madison, WI, 53726

**1:40 PM – 175** – Dynamics of Colloidal Particles in Nematic Liquid Crystals. **Israel E. Lazo** and Oleg D. Lavrentovich, Chemical Physics, Kent State University, Kent, OH, 44242

**2:00 PM – 176** – Theory of Ferroelectric Nanoparticles in Nematic Liquid Crystals. Lena M. Lopatina and **Jonathan V. Selinger**, Liquid Crystal Institute, Kent State University, Kent, OH, 44242

**2:20 PM – 177** – Polymerizable Lyotropic Liquid Crystalline Matrix for Magnetic Alignment of Nanorods and Nanotubes in Polymer Thin Films. **Meagan S. Mauter**, Menachem Elimelech and Chinedum Osuji, Chemical and Environmental Engineering, Yale University, New Haven, CT, 06511

**2:40 PM – 178** – Spinning of Solid Spherical Particles in a Cholesteric Liquid Crystal. **Bohdan Senyuk** and Oleg D. Lavrentovich, Chemical Physics Interdisciplinary Program and Liquid Crystal Institute, Kent State University, Kent, OH, 44242

**3:00 PM** – Break.

**3:20 PM – 179** – Molecular Self-Assembly and Crystallization under Nanoconfinement. **Li Li**, Ruomiao Wang and Guangzhao Mao, Department of Chemical Engineering and Materials Science, Wayne State University, Detroit, MI, 48202

**3:40 PM – 180** – Assembly of Anisotropic Particles by Capillary Interactions: Experiment and Simulations on Micro-Cylinders. **Lorenzo Botto**, Eric Lewandowski and Kathleen J. Stebe, Chemical and Biomolecular Engineering, University of Pennsylvania, Philadelphia, PA, 19104

**4:00 PM – 71** – Lyotropic Liquid Crystalline Phases in Ionic Liquid Solvents. Aikaterini Tsoutsoura and **Paschalis Alexandridis**, Department of Chemical and Biological Engineering, University at Buffalo-The State University of New York (SUNY), Buffalo, NY, 14260-4200

**4:20 PM – 182** – Liquid Crystal Phase of Gold Nanorods. **Paul A. Luchette** and Peter Palffy-Muhoray, Liquid Crystal Institute, Kent State University, Kent, OH, 44242

**4:40 PM – 183** – Rational Self-Assembly of Nano-Colloids Using DNA Interaction. **John C. Crocker**, Department of Chemical and Biomolecular Engineering, University of Pennsylvania, Philadelphia, PA, 19104

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## **Tuesday, June 22, 2010, 9:40 AM – 2:40 PM Colloid and Interfacial Chemistry in Biological Systems 2**

335, Student Union

Organizers/Presiders: Harihara Baskaran, Edgar Kooijman, Heidi Martin

**9:40 AM – 184** – Developing Bacteriophage Functionalized Filter Paper for Decontamination of Drinking Water. **Zeinab Hosseinidoust**<sup>1</sup>, Theo van de Ven<sup>2</sup> and Nathalie Tufenkji<sup>1</sup>, (1)Department of Chemical Engineering, McGill University, Montreal, QC, Canada, h3a 2b2, (2)Department of Chemistry- Pulp and Paper Research Center, McGill University, Montreal, QC, Canada, h3a 2k6

**10:00 AM – 185** – Poly(amino Acid) Derivatives-Coated Iron Oxide Nanoparticles for Effective Magnetic Resonance Imaging of Cancer. Hee-Man Yang, Hyun Jin Lee, Won Hi Hong and **Jong-Duk Kim**, Department of Chemical and Biomolecular Engineering, Korea Advanced Institute of Science and Technology, Daejeon, Chungnam-do, Republic of Korea, 305-701

**10:20 AM – 186** – Computational Design and Experimental Verification of Microfluidic Platforms for Deterministic Arraying of Microparticles for Point-of-Care Applications. **Shahab Shojaei-Zadeh** and Charles Maldarelli, Department of Chemical Engineering and the Levich Institute, City College of New York, New York, NY, 10031

**10:40 AM – 187** – Non-Invasive Delivery of Polymeric Nanocarriers with Pressurized Metered-Dose Inhalers:

Development of a General Platform and Potential Treatment for Chlamydial Respiratory Infections. **Balaji Bharatwaj**<sup>1</sup>, Libo Wu<sup>2</sup>, Judith A. Whittum-Hudson<sup>1,3</sup> and Sandro R. P. da Rocha<sup>1</sup>, (1)Chemical Engineering and Materials Science, Wayne State University, Detroit, MI, 48201, (2)MAP Pharmaceuticals, Mountain View, CA, 94043, (3)Immunology and Microbiology, Wayne State University, Detroit, MI, 48201

**11:00 – 188** – Polyplexes in Pressurized Metered-Dose Inhalers: Novel Formulations for the Non-Invasive Delivery of Genes to the Lungs. **Denise S. Conti**, Balaji Bharatwaj and Sandro R. P. da Rocha, Department of Chemical Engineering and Materials Science, Wayne State University, Detroit, MI, 48202

**11:20 AM – 189** – Location of Stearic Acid Delivered to Stratum Corneum from a Body Wash. **Surajit Mukherjee**<sup>1</sup>, Melody Edmunds<sup>1</sup>, Xuegong Lei<sup>2</sup>, Maria F. Ottaviani<sup>3</sup>, Kavserri P. Ananthapadmanabhan<sup>1</sup> and Nicholas J. Turro<sup>2</sup>, (1)Unilever HPC-NA, Trumbull, CT, 06611, (2)Department of Chemistry, Columbia University, New York, NY, 10027, (3)Institute of Chemical Sciences, University of Urbino, Urbino, Italy, 61029

**11:40 AM** – Lunch.

**1:20 PM – 190** – Ferrocene-Based Cationic Lipids for DNA Delivery. **Burcu S. Aytar**<sup>1</sup>, John P. E. Muller<sup>1</sup>, Yukishige Kondo<sup>2</sup>, Nicholas L. Abbott<sup>1</sup> and David M. Lynn<sup>1</sup>, (1)Department of Chemical and Biological Engineering, University of Wisconsin-Madison, Madison, WI, 53706, (2)Department of Industrial Chemistry, Tokyo University of Science, Tokyo, Japan

**1:40 PM – 191** – Rod-Like Micelles for Rapid Electrophoretic Separations of DNA. **Stephen B. Istivan**, Angela L. Holmen and James W. Schneider, Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213

**2:00 PM – 192** – Change in Phase Separation Behavior of Asymmetric Lipid Bilayers by Addition of Cubic and Quartic Terms. **Fanindra P. Bhatta**, Elizabeth K. Mann and David W. Allender, Department of Physics, Kent State University, Kent, OH, 44242

**2:20 PM – 234** – Dynamic electrophoretic mobility measurements can provide direct observation of charge anisotropy in hiv env-glycoproteins. **D Fairhurst**<sup>1</sup>, R Rowell<sup>2</sup>, S Key<sup>3</sup>, I Monahan<sup>3</sup>, D Stieh<sup>3</sup>, A Morfesis<sup>4</sup>, C. Mujat<sup>4</sup>, A Loxley<sup>5</sup> and RJ Shattock<sup>3</sup>, (1)International Partnership for Microbicides, MD, USA, (2) University of Massachusetts, MA, USA, (3)St. George's, University of London, UK, (4)Malvern Instruments, Malvern, UK and (5)Particle Sciences Inc., PA, USA

**Tuesday, June 22, 2010, 1:20 PM – 5:00 PM**  
**Colloid and Interfacial Chemistry in Energy Systems 1**  
310, Student Union

Organizer/Presiders: Matthew Liberatore, Steven Chuang

**1:20 PM – 193 – Keynote:** Nanoparticle Morphology in Polymer-Based Solar Cells and Its Effect on Performance. **Michael E. Mackay**, Department of Materials Science and Engineering, University of Delaware, Newark, DE, 19716

**2:00 PM – 194** – Aqueous Soft Matter Based Photovoltaic Devices. **Hyung-Jun Koo**<sup>1</sup>, Suk Tai Chang<sup>2</sup>, Rajesh R. Naik<sup>3</sup> and Orlin D. Velev<sup>1</sup>, (1)Department of Chemical and Biomolecular Engineering, North Carolina State University, Raleigh, NC, 27695, (2)School of Chemical Engineering and Materials Science, Chung-Ang University, Seoul, Republic of Korea, (3)Materials and Manufacturing Directorate, Air Force Research Laboratory, Dayton, OH, 45433

**2:20 PM – 195** – Electrochemical Studies on Porous Titania Electrodes for Photovoltaics. **Sonia S. Mathew** and Ilona Kretzschmar, Department of Chemical Engineering, City College of New York (CUNY), New York, NY

**2:40 PM – 196** – Visible Light Photoreduction of CO<sub>2</sub> Using Heterostructures of Nanocrystalline TiO<sub>2</sub> and Semiconductor Quantum Dots. **Christopher Matranga**, Congjun Wang, Robert Thompson and John Baltrus, Chemistry and Surface Science Division, National Energy Technology Laboratory, U.S. Dept. of Energy, Pittsburgh, PA, 15236

**3:00 PM** – Break.

**3:20 PM – 197** – Surface Chemistry of Solid Oxide Materials for High Temperature PEMFCs. **Serguei N. Lvov**, Department of Energy and Mineral Engineering, Department of Materials Science and Engineering, The EMS Energy Institute, The Pennsylvania State University, State College, PA, 16802

**4:00 PM – 198** – Effect of Adsorbed Sulfur (S) on Electrocatalytic Behavior of Pt-Based Nanoparticles. **In-Su Park**, Dianne Oseno Atienza, Augusta Hofstead-Duffy and YuYe Jay Tong, Department of Chemistry, Georgetown University, Washington, DC, 20057

**4:20 PM – 199** – In Situ ATR-FTIR Investigation of Adsorbed CO Oxidation on M@Pt (M=Ru, Au). **De-Jun Chen**<sup>1,2</sup>, Augusta Hofstead-Duffy<sup>1</sup>, In-Su Park<sup>1</sup>, Dianne Oseno Atienza<sup>1</sup>, Shi-Gang Sun<sup>2</sup> and YuYe J. Tong<sup>1</sup>, (1)Department of Chemistry, Georgetown University, Washington, DC, 20057, (2)Department of Chemistry, Xiamen University, Xiamen, Fujian, China, 361005

**4:40 PM – 200** – Rheology Modification and Enzyme Kinetics of High Solids Cellulosic Slurries. **Matthew W. Liberatore** and Jeffrey S. Knutsen, Department of Chemical Engineering, Colorado School of Mines, Golden, CO, 80401

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**Tuesday, June 22, 2010, 3:20 PM – 5:00 PM**

**Polymer Colloids 2**

314, Student Union

Organizer/Presiders: Yakov Lapitsky, Syed Qutubuddin

**3:20 PM – 201 – Keynote:** Anisotropic Colloids and Fibers Via Electrohydrodynamic Co-Jetting. **Joerg**

**Lahann**, Department of Chemical Engineering, Department of Materials Science and Engineering, Macromolecular Science and Engineering Program, University of Michigan, Ann Arbor, MI, 48109

**4:00 PM – 202 –** Polymerization of Emulsified Microemulsions. Todd Thorson and **Jennifer O'Donnell**, Chemical and Biological Engineering, Iowa State University, Ames, IA, 50011

**4:20 PM – 203 –** Synthesis of Particulate Hydrogels with Controlled Porosity Using Polymerizable Nanoemulsions. **Matthew E. Helgeson**, Shannon E. Moran and Patrick S. Doyle, Department of Chemical Engineering, Massachusetts Institute of Technology, Cambridge, MA, 02139

**4:40 PM – 204 –** Microfluidic Generation of Polymer Capsules and Their On-Chip Connection into Chains. **Kunqiang Jiang**<sup>1</sup>, Chanda Arya<sup>2</sup>, Srinivasa R. Raghavan<sup>2</sup> and Don L. DeVoe<sup>3</sup>, (1)Department of Chemistry and Biochemistry, University of Maryland-College Park, College Park, MD, 20740, (2)Department of Chemical & Biomolecular Engineering, University of Maryland-College Park, College Park, MD, 20740, (3)Department of Mechanical Engineering, University of Maryland-College Park, College Park, MD, 20740

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**Tuesday, June 22, 2010, 5:30 PM – 6:20 PM**

**Unilever Award**

Ballroom A, Student Union

Organizer/Presider: Darsh Wasan

**5:15 PM – 205 –** Microengineered and Self-Assembled Hydrogels for Tissue Engineering and Stem Cell Bioengineering. **Ali Khademhosseini**<sup>1,2</sup>, (1)Department of Medicine, Brigham and Women's Hospital/Harvard Medical School, Boston, MA, 02139, (2)Harvard-MIT Division of Health Sciences and Technology, Harvard University, Cambridge, MA, 02139

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**Wednesday, June 23, 2010, 8:30 AM – 9:20 AM**

**LaMer Award**

Ballroom A, Student Union

Organizer/President: Michael Bevan

**8:30 AM – 206** – Surface Engineering Using Layer-by-Layer Assembly of pH-Sensitive Materials. **Daeyeon Lee**, Department of Chemical and Biomolecular Engineering, University of Pennsylvania, Philadelphia, PA

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**Wednesday, June 23, 2010, 9:40 AM – 11:00 AM**  
**Colloid and Interfacial Chemistry in Energy Systems 2**

310, Student Union

Organizer/Presiders: Matthew Liberatore, Steven Chuang

**9:40 AM – 207 – Keynote:** Development of Hierarchically Porous Carbons for Energy-Related Applications by Using Block Copolymers and Colloidal Silica Templates. **Mietek Jaroniec**, Chemistry, Kent State University, Kent, OH, 44242

**10:20 AM – 208** – Hard Carbon Spheres as Micro-Bearings for Water-Based Lubrication. **Noshir Pesika**, Vijay John, Joy St Dennis and Kejia Jin, Chemical & Biomolecular Engineering Department, Tulane University, New Orleans, LA, 70118

**10:40 AM – 209** – Effect of Salinity on Water-in-Crude Oil Emulsion Stability: Evaluation of Drop-Size Distribution Proxy. **Mehrnoosh M. Bidhendi** and Vladimir Alvarado, Department of Chemical and Petroleum Engineering, University of Wyoming, Laramie, WY, 82071

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**Wednesday, June 23, 2010, 9:40 AM – 11:20 AM**  
**General Papers 3**

312, Student Union

Organizers: Michael Bevan, Joelle Frechette

President: G. Kane Jennings

**9:40 AM – 210** – Frictional Performance and Tribological Durability of Monolayer Films. **Brandon Booth**, Kane Jennings and Clare McCabe, Department of Chemical and Biomolecular Engineering, Vanderbilt University, Nashville, TN, 37235

**10:00 AM – 212** – Conductive and Photocatalytic Thin Films Based on Layer-by-Layer Assembly of Charged Species in Non-Polar Solvents. **Kwadwo E. Tettey**<sup>1</sup>, Michael Q. Yee<sup>2</sup> and Daeyeon Lee<sup>1</sup>, (1)Department of Chemical and Biomolecular Engineering, University of Pennsylvania, Philadelphia, PA, 19104, (2)Department of Bioengineering, University of Pennsylvania, Philadelphia, PA, 19104

**10:20 AM – 213** – Cu and Al Dopants for Tuning the Properties of ZnO Thin Films. **James B. Miller**, Tejasvi Ashok and Sojung Lee, Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA, 15213

**10:40 AM – 214** – Pattern Formations in Langmuir Films of Chiral Lipids. **Prem B. Basnet**<sup>1</sup>, Elizabeth K. Mann<sup>1</sup> and Sahraoui Chaieb<sup>2</sup>, (1)Department of Physics, Kent State University, Kent, OH, 44242, (2)Department of Mechanical Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, 61801

**11:00 AM – 215** – Debonding of an Elastic Matrix from Rigid Spherical Inclusions as a Function of Filler Concentration. **Benjamin H. Rutz** and John C. Berg, Department of Chemical Engineering, University of Washington, Seattle, WA, 98115

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**Wednesday, June 23, 2010, 9:40 AM – 11:20 AM**  
**General Papers 4**

316, Student Union

Organizers: Michael Bevan, Joelle Frechette

President: Rafael Tadmor

**9:40 AM – 220** – Effect of Surfactant Concentration on Surface Dilatational Rheology Measurements of Oppositely Charged Polyelectrolyte-Surfactant Aggregates at the Air-Liquid Interface. **Matthew D. Reichert**<sup>1</sup>, Carlton F. Brooks<sup>2</sup>, Anne M. Grillet<sup>2</sup>, Lisa A. Mondy<sup>2</sup> and Lynn M. Walker<sup>1</sup>, (1)Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA, 15217, (2)Sandia National Laboratories, Albuquerque, NM, 87185

**10:00 AM – 219** – Biocompatible Microemulsion Gels. **Xiao Yue (Carol) Xuan** and Edgar Acosta, Department of Chemical Engineering and Applied Chemistry, University of Toronto, Canada

**10:20 AM – 218** – Application of the HLC-NAC Model to Extended Surfactants and Surfactant Mixtures. **Sumit Kiran** and Edgar Acosta, Department of Chemical Engineering and Applied Chemistry, University of Toronto, Canada

**10:40 AM – 217** – Investigations on the Competitive Adsorption of CO<sub>2</sub> from Binary Gas Mixtures in a Structurally Dynamic Porous Coordination Polymer. **Jeffrey T. Culp**<sup>1,2</sup>, Kristi L. O'Neal<sup>1</sup>, Angela Goodman<sup>1</sup>, Thomas D. Brown<sup>1</sup> and Christopher Matranga<sup>1</sup>, (1)National Energy Technology Laboratory, Pittsburgh, PA, 15236, (2)URS, South Park, PA, 15219

**11:00 AM – 216** – Surface-Initiated Polymethylenation: A Borane-Initiated Polymerization To Prepare Superhydrophobic Films. **Juan Carlos Tuberquia**, Nabijan Nizamidin and G. Kane Jennings, Chemical and Biomolecular Engineering, Vanderbilt University, Nashville, TN, 37235

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**Wednesday, June 23, 2010, 9:40 AM – 11:40 AM**

**Self Assembly & Liquid Crystals 3**

Ballroom B, Student Union

Organizers: Oleg Lavrentovich, Elizabeth Mann, Qi-Huo Wei

Presider: Qi-Huo Wei

**9:40 AM – 221** – Probing the Interactions of DNA-Functionalized Colloids with Scanning-Line Optical Tweezers. **William B. Rogers** and John C. Crocker, Department of Chemical and Biomolecular Engineering, University of Pennsylvania, Philadelphia, PA, 19104

**10:00 AM – 222** – Hydrophobic Functionalized Gold Nanorods: Opportunity and Challenge. **Quan Li**<sup>1</sup>, Yannian Li<sup>1</sup>, Dingshan Yu<sup>2</sup>, Liming Dai<sup>2</sup> and Augustine Urbas<sup>3</sup>, (1)Liquid Crystal Institute, Kent State University, Kent, OH, 44242, (2)Department of Chemical Engineering, Case Western Reserve University, Cleveland, OH, 44106, (3)Materials and Manufacturing Directorate, Air Force Research Laboratory, WPAFB, OH, 45433

**10:20 AM – 223** – Electrically Controlled Colloidal Dispersion of Metal Nano-Rods in Dielectric Fluid. **Andrii B. Golovin**<sup>1</sup> and Oleg D. Lavrentovich<sup>1,2</sup>, (1)Liquid Crystal Institute, Kent State University, Kent, OH, 44242-0001, (2)Chemical Physics Interdisciplinary Program, Kent State University, Kent, OH, 44242-0001

**10:40 AM – 224** – Controllable Side-by-Side Self Assembly of Gold Nanorods. **Kyoungweon Park**, Dhriti Nepal and Richard A. Vaia, Nanostructured and Biological Materials Branch, Air Force Research Laboratory, Wright-Patterson AFB, OH, 45433

**11:00 AM – 225** – Strain Induced Alignment of Particles by Elastomeric Hosts. **Jeremy Neal**<sup>1</sup>, Ines Busuladzic<sup>2</sup>, Dmitry Golovaty<sup>2</sup>, Xiaoyu Zheng<sup>3</sup> and Peter Palffy-Muhoray<sup>1</sup>, (1)Liquid Crystal Institute, Kent State University, Kent, OH, 44242, (2)Department of Theoretical and Applied Mathematics, The University of Akron, Akron, OH, 44325, (3)Department of Mathematical Sciences, Kent State University, Kent, OH, 44242

**11:20 AM – 226** – Refractive Index Measurement of Gold Nanorod Embedded Elastomers. **Christopher A. Grabowski**, Paul A. Luchette and Peter Palffy-Muhoray, Liquid Crystal Institute, Kent State University, Kent, OH, 44242

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**Wednesday, June 23, 2010, 9:40 AM – 11:20 AM**

**Self Assembly & Liquid Crystals 4**

335, Student Union

Organizers: Oleg Lavrentovich, Elizabeth Mann, Qi-Huo Wei

Presider: Elizabeth Mann

**9:40 AM – 229** – Structural Control of Porous Polymeric Materials through Magnetic Gelation. **Marco Furlan**, Bastian Brand, Marco Lattuada and Massimo Morbidelli,

Institute for Chemical and Bioengineering, ETH Zurich, Zurich, Switzerland, 8093

**10:00 AM – 227** – Investigation of Preformed Vinyl Carbenes as Head Groups for Monolayers on Gold.

**Yunho Kim** and Christopher B. Gorman, Chemistry, North Carolina State University, Raleigh, NC, 27612

**10:20 AM – 228** – Characterization of Surface and Frictional Properties of Two-Component Alkylsilane Monolayers on Silicon. **Steven G. Vilt**, Ben Lewis, Claire McCabe and Kane Jennings, Department of Chemical and Biomolecular Engineering, Vanderbilt University, Nashville, TN, 37209

**10:40 AM – 230** – Light Induced Biopolymer Gelation. **Vishal Javvaji**<sup>1,2</sup>, Aditya Baradwaj<sup>1</sup>, Payne F. Gregory<sup>2</sup> and Srinivasa R. Raghavan<sup>1</sup>, (1)Department of Chemical and Biomolecular Engineering, University of Maryland, College Park, MD, 20742, (2)Center for Biosystems Research, University of Maryland Biotechnology Institute, College Park, MD, 20742

**11:00 AM – 231** – Can Simple Salts Influence Self-Assembly in Oil? Multivalent Cations as Efficient Gelators of Lecithin Organosols. **Hee-Young Lee**<sup>1</sup>, Shih-Huang Tung<sup>2</sup> and Srinivasa R. Raghavan<sup>1</sup>, (1)Department of Chemical and Biomolecular Engineering, University of Maryland, College Park, MD, 20740, (2)Department of Polymer Science and Engineering, National Taiwan University, Taipei, Taiwan Republic of China, 10617