

First Sustainable Nanotechnology Organization Conference www.susnano.org

Sunday, November 4—Tuesday, November 6, 2012 Arlington Hilton Hotel Arlington, VA

Sponsors:







About SNO

SNO is a non-profit, international professional society dedicated to advancing sustainable nanotechnology around the world through education, research, and promotion of responsible growth of nanotechnology. SNO started from discussions at the inaugural Gordon Research Conference (GRC) on Environmental Nanotechnology held in Waterville, Valley, N.H., in 2011, with 157 attendees from 14 countries (http://www.grc.org/programs.aspx?)
year=2011&program=environano)).

A major objective of SNO is to provide platforms where scientists, engineers, and other professionals can exchange information and ideas for the development and responsible application of nanotechnology that would lead to overall sustainability. SNO will hold an annual conference, training workshops, educational outreaches for the lay public, membership events, publications & newsletters, awards, legislative guidance, industrial partnerships and student awards. The long-term goal of SNO is to serve as a focal point for the issues of sustainability as it relates to nanotechnology.

As a follow up to this GRC meeting, surveys were conducted to determine the need for an independent professional organization that will promote the sustainability of nanotechnology. The overwhelming responses pointed to the need for the establishment of SNO. About 80% of the respondents observed that professional organizations were generally aware of the importance of the interdisciplinary nature of nanotechnology, but there was no single professional society focused solely on nanotechnology and particularly on sustainability.

Among SNO's most important roles are the advancement of applications, implications, and societal benefits of nanotechnology. SNO seeks to be the authoritative voice for the wider nanotechnology related disciplines and will advocate for the value of nanotechnology to society. It will communicate objectively with and respond to US and international government agencies. Through its industrial members, SNO will engage companies and key corporate leaders of the nanotechnology revolution. It will also identify and act on common interests that will further advance nanoscience and engineering, including the enhancement of public health and welfare. SNO promotes inter-society relationships, (e.g. ACS, RSC, MRS, SETAC, AIHA etc.), as well as inspires young, future leaders about the benefits of nanotechnology to attaining sustainability. Through its award program, SNO will recognize and honor those who have made significant contributions to sustainable nanotechnology.

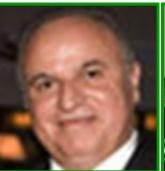
Organizers



Barb Karn NSF



Wunmi Sadik
SUNY Binghamton



Phillip Demokritus Harvard University



Vinka Craver URI



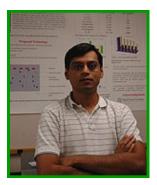
Katrina Varner EPA



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Paul Westerhoff ASU, NIEHS



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Paul Westerhoff, Arizona State University
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Candace Tsai, UMass Lowell
Sudipta Seal, University of Central Florida
Michael Ellenbecker, UMass Lowell
Vishal Shah, Dowling College
Katrina Varner, EPA
Andrew Maynard, University of Michigan
Jackie Isaacs, Northeastern University

Barbara Karn (National Science Foundation)

Welcome

The SNO organizing committee welcomes you to Washington, DC and the first annual SNO conference. The objective of this conference is to bring together scientific experts from academia, industries, and government agencies from around the world to present and discuss current research findings on the subject of nanotechnology and sustainability.

The conference program will address the critical aspects of sustainable nanotechnology such as green synthesis, green energy, industrial partnerships, environmental and biological fate and transport, environmental applications, sensors and monitoring, standards, food and agriculture, medical applications, etc.

We have an exciting three days planned. There will be approximately 120 oral presentations, 6 plenary speakers, 60 poster presentations plus a SNO business meeting. The goal is to make the SNO conference a place where a new community of sustainable nanotechnology is formed and advanced. We have built in plenty of time for networking and social interactions. This includes the Sunday evening welcome reception and banquet. Note that we will make this a tradition at the SNO meetings to make the welcome dinner the SNO business meeting and a very special evening. This year's event will also honor outstanding leaders in sustainable nanotechnology.

Many people have put in the long hours to make the first SNO conference come to life. The list is too long to recognize here, but we want to thank the program committee members and the SNO steering committee. We want to offer a special thank you to the NSF, ACS, NIA, and the conference sponsors whose generous support have allowed us to plan such an ambitious meeting.

In closing, we thank you for participating on the first SNO conference. And we hope you enjoy the next three days.

Omowunmi Sadik, SUNY-Binghamton, Conference Chair

Barbara Karn, NSF, Conference Vice Chair

Session Chairs

Sudipta Seal, UCF Rajender S. Varma, US EPA Lynn L. Bergeson, Bergeson & Campbell, PC **Clayton Teague, formerly NNCO Norman Scott, Cornell University** Phillip Demokritou, Harvard University **Bob Hamers, U. Wisconsin** Bellina Veronesi, US EPA **Ahmed Busnaini, Northeastern** Jamie Lead, USC Ram B. Gupta, NSF and Auburn University **Dorothy Farrell, NIH, NCI** Thomas Peters, University of Iowa **Candice Tsai, UMass Lowell Srikanth Nadadur, NIEHS Wunmi Sadik, SUNY Binghamton**

Plenary I: Nanotechnology Sustainability and Safe Implementation Dr. André Nel

10:30 AM, Sunday, November 4, 2012



Dr André Nel is a Professor of Medicine and Chief/ founder of the Division of NanoMedicine at UCLA. He is the Director of the UC Center for the Environmental Impact of Nanotechnology (CEIN) and the UCLA Center for Nano Biology and Predictive Toxicology which are housed in the California NanoSystems Institute (CNSI) at UCLA. Dr Nel served a Chair of an NIH Study Section, has been nominated as a Distinguished Foreign Professor by the Chinese Academy of Science, a peer-selected member of Best Doctors of America, recipient of the John Salvaggio Memorial Award recognizing his outstanding service to the specialty and science of Allergy and Immunology, and has represented the NIH and State Department in establishing cooperative research agreements with Japan, the Chinese Academy of Sciences and Russia. He is associate editor of ACS Nano and his chief research interests are nanomedicine, nanotechnology environmental health and safety, and nanobiology.

Plenary II: Global Issues for Sustainable Technology Dr. Mihail Roco

11:15 AM, Sunday, November 4, 2012



Dr. Roco is the founding chair of the U.S. National Science and Technology Council's subcommittee on Nanoscale Science, Engineering and Technology (NSET), and is the Senior Advisor for Nanotechnology at the National Science Foundation. Prior to joining National Science Foundation, he was professor of mechanical and chemical engineering. Dr. Roco is credited with thirteen inventions, contributed over two hundred articles and twenty books on multiphase systems, computer simulations, nanoparticles and nanosystems, trends in emerging technologies, and societal implications. Recent books include "Nanotechnology Research Directions for Societal Needs in 2020" (2011), "Managing Nano-Bio-Info-Cognition Innovations" (2007), "Mapping Nanotechnology Knowledge and Innovation: Global and Longitudinal Patent and Literature Analysis" (2009). He is a key architect of the

National Nanotechnology Initiative, and coordinated the preparation of the U.S. National Science and Technology Council reports on "Nanotechnology Research Directions" (2000).

Dr. Roco is a Correspondent Member of the Swiss Academy of Engineering Sciences, a Fellow of the American Society of Mechanical Engineers, a Fellow of the Institute of Physics, and a Fellow of the American Institute of Chemical Engineers. He has been co-founder and Chair of the International Multiphase Flow Council and Particle Technology Forum, and a member of the International Risk Governance Council in Geneva. He serves as Editor-in-chief of the Journal of Nanoparticle Research. Dr. Roco was elected Engineer of the Year by the U.S. Society of Professional Engineers and NSF in 1999 and 2004, and was awarded the National Materials Advancement Award from the Federation of Materials Societies in 2007 "as the individual most responsible for support and investment in nanotechnology by government, industry, and academia worldwide".

Plenary III: Industry and Sustainable Nanotechnology Dr. Celia Merzbacher

8:30 AM, Monday, November 5, 2012



Celia Merzbacher is Vice President for Innovative Partnerships at the Semiconductor Research Corporation (SRC), a nonprofit industry consortium that invests in basic research at universities on behalf of its members. She is primarily responsible for developing new initiatives and partnerships with stakeholders in government and the private sector in support of SRC's research and education goals. Current research areas of interest include renewable energy technologies, sustainable manufacturing, bioelectronics, sensors, and trustworthy semiconductors and systems.

Prior to joining SRC, Dr. Merzbacher was Assistant Director for Technology R&D in the White House Office of Science and Technology Policy (OSTP), where she coordinated and advised on a range of issues, including nanotechnology, technology transfer, technical standards, and

intellectual property. She also served as Executive Director of the President's Council of Advisors on Science and Technology.

Before taking the position at OSTP, she was a scientist at the Naval Research Laboratory in Washington DC, where she served as a licensing executive and performed nanoscale materials research on various optical materials. Her research led to 5 patents and numerous technical publications.

Dr. Merzbacher served on the Board of Directors of the American National Standards Institute and led the U.S. delegation to the Organization for Economic Cooperation and Development Working Party on Nanotechnology. She currently is on a number of academic advisory boards and the advisory board of a startup company that is developing energetic nanomaterials.

Plenary IV: Role of Sustainable Nanotechnology in Economic Development Thomas Guevara

9:15 AM, Monday, November 5, 2012



Thomas Guevara in his capacity as Deputy Assistant Secretary for Regional Affairs directs and supervises the activities of the Economic Development Administration's (EDA) Office of Regional Affairs, including the Performance and National Programs Division and all six EDA Regional Offices. EDA's Regional Offices are responsible for program delivery of investments that fulfill the agency's mission of leading the federal economic development agenda by promoting competitiveness and preparing American regions for growth and success in the worldwide economy. Mr. Guevara brings over 21 years of management experience in financial advisory services, public-private partnership finance, and local economic development consulting.

Most recently, Mr. Guevara served as a Director at Crowe Horwath LLP in Indiana, where he managed financial

advisory services for over \$1 billion in bond sales for public and publicprivate capital projects and delivered economic impact studies for projects totaling over \$500 million. He previously worked for the state of Indiana as CIO of the largest state agency, where he was responsible for information technology projects and expenditures in excess of \$140 million annually, serving over 8500 agency users statewide, and administered by over 250 employees and contractors. Mr. Guevara also served as Assistant State Budget Director at the Indiana State Budget Agency, where he headed the Health and Human Services division. Mr. Guevara's budget oversight responsibilities included over \$3 billion in agency budgets, meeting the Governor's mandated spending reduction targets, negotiating budgets with agency heads and legislators, and implementing new spending plans.

Mr. Guevara also has served as an adjunct professor at Indiana University, teaching finance, management and budgeting courses to graduate and undergraduate students.

Plenary V: Societal and Policy Considerations Dr. David Guston

8:30 AM, Tuesday, November 6, 2012



David H. Guston is Professor of Politics and Global Studies and Co-Director of the Consortium for Science, Policy and Outcomes at Arizona State University. He is also the Principal Investigator and Director of the Center for Nanotechnology in Society at ASU. CNS-ASU, funded by the National Science Foundation for roughly \$13 million over ten years (2005-2015), pursues a vision of the anticipatory governance of nanotechnology and is dedicated to research, training and outreach on the societal implications of nano-scale science and engineering. His book, Between Politics and Science (Cambridge U. Press, 2000) was awarded the 2002 Don K. Price Prize by the American Political Science Association for best book in science and technology policy, and his papers are among the best-cited in the field. His most recent publication, "The Pumpkin or the Tiger: Michael Polanyi, Frederick Soddy, and Anticipating

Emerging Technologies" is written in the creative nonfiction style and published in the 50th anniversary issue of *Minerva*. His nanotechnology-related endeavors include: organizing with the Woodrow Wilson International Center a briefing to the US Congressional Nanotechnology Caucus on "Nanotechnology and the Public: Data for Decision Makers;" editing the *Encyclopedia of Nanoscience and Society* (Sage, 2010); and serving as series editor for the *Yearbook of Nanotechnology in Society* (Springer), which has published volumes on *Presenting Futures*, *Nanotechnology and the Challenge of Equity, Equality and Development*, and most recently, *Nanotechnology, the Brain, and the Future*. Professor Guston has held visiting positions at Columbia University, the Copenhagen Business School (DK), the Kent School of Law, and Durham University (UK). In 2002, he was elected a fellow of the American Association for the Advancement of Science. In 2008, he served as co-chair of the Gordon Research Conference on Science and Technology Policy, "Governing Emerging Technologies." He holds an A.B. from Yale College and a PhD in political science from MIT.

Plenary VI: Sustainability Analysis for Products and Processes Dr. Subhas Sikdar

9:15 AM, Tuesday, November 6, 2012



Dr. Subhas K. Sikdar is the Associate Director for Science for the National Risk Management Research Laboratory of the U.S. EPA in Cincinnati, Ohio. Before joining EPA in 1990, Dr. Sikdar held managerial positions at the National Institute of Standards and Technology in Boulder, Colorado, and General Electric Corporate Research & Development Center in Schenectady, New York. He began his professional career as a Senior Research Engineer with Occidental Research Corporation in Irvine, California in 1975. Dr. Sikdar received his M.S. and Ph.D. in chemical engineering from the University of Arizona. Dr. Sikdar is elected Fellow of the American Association for the Advancement of Science (AAAS), Fellow of both American Chemical Society (ACS) and American Institute of Chemical Engineers, Honorary Fellow of the Indian Institute of Chemical Engineers, winner of five EPA bronze

medals, two R&D 100 awards, AIChE's Larry Cecil Award for Environmental Chemical Engineering, AIChE's Sustainability Achievement Award, and Distinguished Engineering Alumnus Award from both University of Arizona and University of Calcutta. He served as a member of the Board of Governors of the Council for Chemical Research (CCR) and of the Green Chemistry Institute. He served as the Founder/Chair of Sustainable Engineering Forum, Chair of Institute of Sustainability, and currently chairs the Engineers' Forum for Sustainability. For 22 years he championed the concepts and methods for clean products and processes for the Agency and in NATO projects and engineering workshops. He is a current member of the Industrial Advisory Board of University of Arizona, University of Pittsburgh, University of Michigan, and University of Kentucky. He is the founder and the co-Editor-in-Chief of the international journal, Clean Technologies and Environmental Policy, published bimonthly by Springer Verlag of Germany. Dr. Sikdar has published more than 80 technical papers in reputed journals, has 27 U.S. patents, and has edited 15 books.

Conference
Schedule
of
Events

Sunday, November 4, 2012

	Registration (8:30-10:00)	
10:00	Welcome: SNO Vision, mission, context, why, survey, etc.	Wunmi Sadik, Barbara Karn
10:30	Plenary I: Nanotechnology Susustainability and Safe Implementation	Andre Nel
11:15	Plenary II: Global Development of Nanotechnology	Mike Roco
	Lunch (12:00-13:00)	
	Concurrent Session 1a: Green Synthesis	
13:00	Greener Pathways to Nanomaterials and Their Sustainable Applications	Rajender S. Varma
13:30	Green Synthesis of Nanomaterials: A Necessity for Sustainability	Barbara Karn
13:50	Synthesis and Processing of Metallic Nanomaterials using CO2 eXpanded Liquids as a Green Solvent Media	Christopher L. Kitchens
14:10	Rational Design of Carbon Nanotube Dispersions and Toxicity Elimination	Jean-Claude J. Bonzongo
14:30	A novel method for bacteria inactivation using Engineered Water Nanostructures	Georgios Pyrgiotakis
14:50	Gate-to-Gate Life Cycle Assessment of Gold Nanoparticle Synthesis Process	Paramjeet Pati
15:10	Nanoarchitectonic Approaches to Design Green Polymers to Enhance Effectiveness of Nanoparticles in Groundwater Remediation	Achintya Bezbaruah
15:30	Safe by design: Demonstrating the efficiency of a safer formulation concept for flame-generated engineered nanomaterials (ENMs)	Phil Demokritou
	Break (15:50-16:10)	
16:10	Ceria Nanoparticles: Planned and Unplanned Preparation, Delivery, and Environmental Impacts on Particle Properties	Donald R. Baer
16:30	Fate of Nanomaterials in Municipal Solid Waste Landfills	Stephanie C. Bolyard
16:50	Coherent vibrational and electronic spectroscopy of engineered and natural nanoparticles	Franz M. Geiger
	Concurrent Session 1b: Environmental Application	ions
13:00	Nanomaterials and the Environment: Scientific Issues for Chemists and Materials Scientists	Robert J. Hamers
13:30	Greener Magnetic nano-Adsorbents for Water Treatment	Arturo A. Keller
13:50	Graphene-Based Environmental Barriers	Fei Guo

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14:10	Sustainable technologies to reduce and safely degrade pollutants	Wunmi Sadik
14:30	Oil-Water Separation by Wrap-and-Pull Using Superparamagnetic Carbon Nanotubes	Chongzheng Na
14:50	Adherence of Silver Nanoparticles to Ceramic Water Filters: the Value of Raman Spectroscopy	Anne Mikelonis
15:10	Effect of manufacturing variables and influent water conditions on bacterial reduction effectiveness of point-of-use ceramic water filters	Hongyin Zhang
15:30	Synergistic Effects between Solar Light-activated NF-TiO2 and Various Oxidants for the Destruction of Atrazine and Amitrole in Water	Joel Anderson
	Break (15:50-16:10)	
16:10	Antimicrobial Properties of Fullerene Derivatives as a Function of Structure and Aggregation State	Samuel Snow
16:30	Numerical electrokinetic method to determine surface coating thickness on nanoparticles improves prediction of transport behavior	Stacey M. Louie
16:50	The interaction of silver and cerium oxide nanoparticles with algae, daphnia and soft water OECD media and fulvic acid.	R. C. Merrifield
	Concurrent Session 1c: Sustainable Nano Curriculum &	Education
13:00	The Interdisciplinary nature of Nanoscience and Technology Education	Sudipta Seal
13:30	Teaching systems thinking for sustainable nanotechnology	Callie Babbitt
13:50	Direct to Discovery (D2D): An Innovative Digital Approach to Extending University-based Nanoscience into K-12 Classrooms in the US and Abroad	W. Jud Ready
14:10	Teaching Ethics through Role Playing in a Nanotechnology Class for First Year College Students	Kurt Winkelmann
14:30	Making use of the educational potential of nanoscale energy production and conservation	George Lisensky
14:50	Opportunities and Challenges toward Education at the Nanoscale	James Murday
15:10	Use of Sustainable Nanotechnology Examples in the College Classroom: A Rich Educational Opportunity	Deb Newberry
15:30		
	Break (15:50-16:10)	
16:10	NCPI 2.0: Re-inventing the Nanotechnology Consumer Products Inventory through a unique University/NGO Partnership	Matt Hull
16:30	"Yes, I See." - Bringing Nanotechnology Education to Undergraduate Classrooms	Lei Zhai
16:50	Asian Efforts Towards Sustainable Development of Nanotechnology	Lerwen Liu

Reception/cash bar (1	18:00-19:00)
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Dinner and Business Meeting (19:00)

Monday, November 5, 2012

8:30	Plenary III: Industry and Sustainable Nanotechnology	Celia Merzbacher
9:15	Plenary IV: Role of Sustainable Nanotechnology in Economic Development	Thomas Guevara

Break (10:00-10:20)

	Break (10:00-10:20)		
Concurrent Session 2a: Risk Assessment & Industry			
10:20	Critical issues in Risk Assessment of Engineered Nanomaterials: The way towards a sustainable nanotechnology industry	Philip Demokritou	
10:50	Exposure assessment and health outcomes attributable to the nano fraction of familiar polydisperse aerosols	Joseph Brain	
11:10	Responses to Pulmonary Exposure to Carbon Nanotubes in NIOSH Animal Studies	Vincent Castranova	
11:30	Nanocomposite materials: Industrial applications and corresponding models of nanofiller release.	Wendel Wohlleben	
11:50	Risk Assessment for Nanoparticles during Lithium-ion Battery Pre- recycling Processes	Xue Wang	
12:10			
	Concurrent Session 2b: Medical Applications		
10:20	Sustainable Development of Medical Applications of Nanotechnology	Dorothy Farrell	
10:50			
11:10	Multifunctional plasmonic nanoparticles for biomedical applications	Georgios A. Sotiriou	
11:30	Mesoporous Silica Nanoparticles as Complex Bioactive Delivery Vehicles	Kathleen Eggleson	
11:50	RGD Modified Ferritin Nanocages for Imaging and Drug Delivery	Jin Xie	
12:10	Routes of Cellular Uptake of Nano-sized Materials Depend on Compositions of Cell-Penetrating Peptides	Yue-Wern Huang	
	Concurrent Session 2c: Legal Aspects/Policy Considerations		
10:20	Legal Aspects/Policy Considerations	Lynn L. Bergeson	

10:50	Guiding emerging technologies: Applying principles of sustainability and anticipatory governance	Rider Foley
11:10	Soft Law and Nanotechnology: A Functional Perspective	Timothy F. Malloy
11:30	Regulating nano-containing products: identifying gaps in characterizing risks	Therese Garvey
11:50	Bridging the Gap Between the Nanotechnology Consumer Products Inventory and Life Cycle Assessment (LCA)	Sean McGinnis
12:10	MEGA-Nano Forums and Optimal Regulation for the Safe Development of Nanotechnology	Richard Reibstein

Lunch (12:30-13:30)

Lunch (12:30-13:30)		
Concurrent Session 3a: Toxicology of Nanomaterials		
13:30	The Value of Nanotoxicity Testing to Sustainability	Bellina Veronesi
14:00	A novel method for measuring effective density of nano- agglomerates in liquid suspensions: Implications for in vitro dosimetry and nanotoxicology	Joel Cohen
14:20	Nanoparticle binding to homogenous and heterogenous model cell membranes	Aihong Xi
14:40	Interaction of Multiwalled Carbon Nanotubes with Model Cell Membranes	Kai Loon Chen
15:00	The chemistry of sustainable nanotechnology: Impacts of nanomaterial chemistry on the chronic environmental impacts on aquatic species using acute genomic and behavioral information	Devrah Arndt
15:20	Influence of Protein Corona on Nanosilver Toxicity in Epithelial and Endothelial Cells	Jonathan Shannahan
	Break (15:40-16:00)	
16:00	Inhibition of Lung Surfactant by Nanoparticles — More Than Cytotoxicity?	Yi Y. Zuo
16:20	Nanoscale Silver Mediated DNA Damage Under Cell-Free Conditions	Bryant C. Nelson
16:40	The Effect of Nanoparticle Size, Shape, Coating and Composition on Skin Toxicity.	Nancy A. Monteiro- Riviere
17:00	Wound healing of human cells from the cornea is impacted by nanoparticles	Enhua H. Zhou
Concu	rrent Session 3b: Occupational Health and Safety, Occu	pational Hygiene
13:30	Sustainable Occupational Health and Safety for the Nanotechnology Industry	Thomas M. Peters
14:00	Incorporating Life Cycle Thinking into Risk Assessment for Nanoscale Materials: Case Study of Nanocellulose	Jo Anne Shatkin
14:20	Occupational Health & Sustainability; OEHS as a Tool for Innovation	Donald Ewert
14:40	Occupational Health & Safety 15	Candace Tsai

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15:00	Development and Field Evaluation of the Thermophoretic Personal Sampler (TPS)	Gary Casuccio
15:20	Verification of the DiSCmini Personal Monitor for Exposure to Nanoparticles in the Workplace	Jessica Mills
	Break (15:40-16:00)	
16:00	Methods to Evaluate the Effectiveness of Nanoparticle Control Technologies	Michael Ellenbecker
16:20	Sustainability Standard Metrics for Nanomaterials and Nanotechnologies: State of Play	Jo Anne Shatkin
16:40	Unintentional exposure to nanoparticles via an industrial silicon processing accident	Orion Wenrich
17:00		
	Concurrent Session 3c: Green Energy	
13:30	Nanotechnology for Sustainable Energy	Ram B. Gupta
14:00	Stoichiometric control of light absorption by copper-sulfide-based nanoparticles	Katherine E. Plass
14:20	Solar-Light Induced Plasmonic Energy Transfer from Metal to Semiconductor	Nianqiang (Nick) Wu
14:40	Probing the diffusion of colloidal nanoparticles to reveal interactions with complex environments	Stephan Link
15:00	Evaluation of properties and performance of nanoscopic materials in vanadium boride-air batteries	Jessica Stuart
15:20	Nanomaterials in Organic Photovoltaics	Annick Anctil
	Break (15:40-16:00)	
16:00	Towards Solar Fuel Generation with a Carbon Nitride Photocatalyst	Timothy L. Shelton
16:20	Sustainable Energy from Polymer Nanocomposites	Mark Dadmun
16:40	Microwave Assisted Synthesis of Germanium Nanoparticles for Photovoltaic Applications	Elayaraja Muthuswamy
17:00	Nanoscale perspectives on plastic electronic materials and devices	Zhongjian Hu
	Posters (17:30-19:30)	posters down by 9pm

Tuesday November 6, 2012

8:30	Plenary V: Societal and policy considerations	David Guston

9:15	Plenary VI: Sustainability Analysis for Products and Processes	Subhas Sikdar	
	Break (10:00-10:20)		
	Concurrent Session 4a: Standards/ Characterization		
10:20	Sustainable nanotechnology and the UN Millennium Goals	Clayton Teague	
10:50	Transmission electron microscopy for primary particle size distributions of nanomaterials: gold nanoparticle case study.	Angela Hight-Walker	
11:10	Characterization of Nanomaterials Relevant to Biomolecular Interactions	Jim E. Riviere	
11:30	Sustainable Cellulose Nanomaterials Standards Development	World Nieh	
11:50	Development of Nanoscale Reference Materials at NIST: Challenges and Considerations for Sustainable Nanotechnology	Vincent A. Hackley	
12:10	Sizing Nanoparticles for a SustainableFuture – Status, Limitations and Opportunities	Scott C. Brown	
	Concurrent Session 4b: Advanced Manufactur	ing	
10:20	Nanomaterials-based Sustainable Nanomanufacturing for Electronics, Energy and Biotechnology Applications	Ahmed Busnaini	
10:50	Sustainability Assessment of Nanocoating Material: A Life Cycle Based Multiscale Approach	Yinlun Huang	
11:10	Simple Benchtop Reactor System for the High-throughput Synthesis of Functionalize Gold Nanoparticles and Nanorods	Samuel E. Lohse	
11:30	Titanium Dioxide Photo-Oxidation Efficiency in Small- Scale Photothermal Waste Degradation Reactors	Christopher N. Bremer	
11:50	Improving the performance of nanocrystal devices through the encapsulation of semiconductor nanocrystals into heteroepitaxial inorganic matrices.	Mikhail Zamkov	
12:10	Life Cycle Issues for Scalable Nanomanufacturing of CNT-enabled products	Jackie Issacs	
	Concurrent Session 4c: NIEHS Grantees		
10:20	Understanding Mast Cell Activation in the Development of Safe Nanotechnologies	Jared Brown	
10:50	Relationship between protein adsorption and nanotoxicity	Wenwan Zhong	
11:10	Paper Based Disposable Testing Kits for in vitro Genotoxicity Assay upon Nanomaterial Exposure	Chen-Zhong Li	
11:30	Distribution of C60 and Nanosilver in Rats and Mice	Susan Sumner	
11:50	Carbon Nanotube, Nanosilver and Nanoclay Protein Corona Composition in Cell Culture Media	Frank A. Witzmann	
12:10	Tying distinct nanoparticle properties to intracellular fate and response in alveolar epithelial cells	Galya Orr	

	Lunch (12:30-13:30)	
Concurrent Session 5a: Sensors/instruments/monitoring		
13:30	Addressing the Challenges of Rapid & Accurate Characterization of Engineered Nanomaterials	Wunmi Sadik
14:00	Sensing with cation exchange in nanocrystals and nanoclusters	Wenwan Zhong
14:20	Detection of Heavy Metals by Quantum Dot Based Fluorescent Biosensor Via Nanometal Surface Energy Transfer	Nianqiang (Nick) Wu
14:40	Monitoring Nanoparticle Interactions at Biological Interfaces with Nonlinear Optics	Stephanie Walter
15:00	Attachment of modularly functionalized TiO2 nanoparticles to model environmental surfaces	Joel A. Pedersen
15:20		
	Concurrent Session 5b: Food/ Agriculture	
13:30	Nanoscale science and engineering in agriculture and food systems: At a Crossroads	Norman R. Scott
14:00	Synchrotron confirmation of the uptake and translocation of TiO2 nanoparticles in cucumber plants	Alia Servin
14:20	Nanoparticle Electrospray Facilitates the Break of Coat-Imposed Seed Dormancy	Da-Ren Chen
14:40	Interactive Effects of Nano-TiO2 and Soil Water on Soil Microbial Communities	Patricia Holden
15:00	The impact of CeO2 nanoparticles on rice roots: the relationship between enzyme activity, cell membrane damage and lipid content	Cyren M. Rico
15:20	Nanomaterial Interactions with Agricultural Crop Species	Jason C. White
	Concurrent Session 5c: Fate, Transport, Transform	ation
13:30	Fate and behaviour of nanoparticles in the aquatic and terrestrial environment	J. R. Lead
14:00	Challenges in studying the fate and effects of nanoparticles in aquatic systems.	Valery E. Forbes
14:20	When nanoparticles enters the house of microbes – Importance of biofilms in fate and transport of nanomaterials	Alan W. Decho
14:40	Long term stability and metal leaching in natural water systems of commercial single wall carbon nanotubes	Adeyemi Adeleye
15:00	Fate of Engineered Nanomaterials in Constructed Wetland Treatment Systems	Fariya Sharif
15:20	Mobility of nanomaterials in the environment during their life cycle	Armand Masion
15:40	Closing SessionSNO	