

2008 International Conference on Nanotechnology for the Forest Products Industry – Nanotechnology from Research to Applications

As of June 19, 2008

Wednesday, June 25, 2008

8:00 – 8:45 AM

Session 1 “The National Nanotechnology Initiative: Industry, Commercialization and Technology Transfer”

Keynote Speaker: *Clayton Teague*, National Nanotechnology Coordination Office

9:00 – 10:30 AM

Session 2 Environmental Health and Safety Panel Discussion

Session Chairs: (NCASI)/*John Festa*, American Forest & Paper Association (AF&PA)

- “Occupational Safety and Health Nanotechnology in the Workplace”
Charles Geraci, National Institute for Occupational Safety & Health (NIOSH)
- “Evaluating the Safety of Nanomaterials”
Annette Santamaria, ENVIRON
- “Nanotechnology—An EPA Perspective”
James Alwood, Environmental Protection Agency (EPA)

10:45 – 12:15 PM

Session 3

Characterization and Measurement of Nanoscale Structures and Properties I

Session Chair: *James F. Beecher*, USFS Forest Products Laboratory

- “Raman Analysis and Imaging of Cellulose Materials – Wood Cell Wall and Nanocellulose-Polypropylene Composite”
Umesh Agarwal, USFS Forest Products Laboratory
- “Characterization of Cell Walls Treated with Ethylene Glycol Using Nanoindentation”
Joseph Jakes, USFS Forest Products Laboratory
- “Tuning the Release of Active Components from Nanoparticles by Defining the Crystallinity of the Particle Core”
Andreas Nystrom, Washington University-St. Louis

10:45 – 12:15 PM

Session 4

Nanobiotechnology and Wood Quality

Session Chair: *Udaya Kalluri*, Oak Ridge National Laboratory

- “Carbon Nanofiber Arrays: Cell Penetrant Probes for Manipulation of Molecular Scale Events”
Tim McKnight, Oak Ridge National Laboratory
- “Nanomechanical Properties of Biologically Significant Microstructural Elements of Wood”
Valery N. Bliznyuk, Western Michigan University
- “Nanoscale Imaging Plant Cell Wall Biomass Using Non-Destructive Microscopy and Spectroscopy”
Shi-You Ding, National Renewable Energy Laboratory

12:30 – 2:00 PM **Lunch**

Session 5 “Nano in Food and Wood”

Keynote: *Nils Petersen*, Director General, NRC National Institute for Nanotechnology

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<p>2:15 – 3:45 PM <u>Session 6</u> Advancements in Lignin Biodegradation Session Chair: <i>Jeff Catchmark</i>, Penn State University</p> <ul style="list-style-type: none"> • “Modifying Lignin Biosynthesis by Incorporation of Tyrosine-Containing Peptides” <i>Ming Tien</i>, Penn State University • “A Novel Method for Carbon Nanotube Production and the Mechanisms Involved” <i>Barry Goodell</i>, University of Maine • “Elucidating Lignin-Polyelectrolyte Interactions Through Selective Modification of Lignin” <i>Karthik V. Pillai</i>, Virginia Tech 	<p>2:15 – 3:45 PM <u>Session 7</u> Nanomanufacturing Issues and Opportunities Session Chair: <i>Joe Bozell</i>, University of Tennessee</p> <ul style="list-style-type: none"> • “Workplace Assessments for Nanotechnology: Benefits of a Proactive Approach” <i>William Looney</i>, ENSR Corporation • “Self-Assembled Fibrillar Proteins as Scaffolds for Nanomaterials Growth” <i>Lia Stanciu</i>, Purdue University • TBA
<p>4:00 – 5:30 PM <u>Session 8</u> Surface Modification and Characterization Session Chair: <i>Alan Rudie</i>, USFS Forest Products Laboratory</p> <ul style="list-style-type: none"> • “Latest Developments in Nanotechnology for Coatings” <i>John W. Du</i>, BYK-Chemie • “Micropatterning of Cellulose Nanocrystals by Inkjet Printing” <i>Fernando Navarro</i>, Virginia Tech • “A New Paper Coating Nanotechnology with Unique Characteristics to Improve Inkjet Print Density” <i>Martha P. Wild</i>, EKA Chemicals Inc. 	<p>4:00 – 5:30 PM <u>Session 9</u> Reinforced and Interfacial Structures Session Chair: <i>Siqun Wang</i>, University of Tennessee</p> <ul style="list-style-type: none"> • “Thermoplastic Nanocomposite Based on Cellulose Nanocrystals and Polyethylene Terephthalate (Pet)” <i>Alper Kiziltas</i>, University of Maine • “Bio-inspired Chemo-mechanical Cellulose Nanocomposites for Biomedical Applications” <i>Jeffrey Capadona</i>, L. Stokes Cleveland VA Medical Center • “Young’s Modulus of Cellulose Fibrils Measured Using Atomic Force Microscopy” <i>Siqun Wang</i>, University of Tennessee

5:45 – 7:30 PM

Session 10 Conference Pub

Conference Reception, Poster Session and Vendor Displays I

Session Chair: *Phil Jones*, Imerys; *Ted Wegner*, USFS Forest Products Laboratory

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8:00 – 8:45 AM

Session 11 “Insights from NanoBusiness Alliance”

Keynote Speaker: *Sean Murdock*, Nano Business Alliance

<p>9:00 – 10:30 AM</p> <p><u>Session 12</u> Colloid/Surface Science I Session Chair: <i>John Westland</i>, Weyerhaeuser</p> <ul style="list-style-type: none"> • “Assembly and Applications of Nanocomposite Thin Films” <i>Chaoyang Jiang</i>, University of South Dakota • “Nanofibres produced from TEMPO-oxidized cellulose III” <i>Denilson de Silva Perez</i>, Institut Technologique FCBA • “Washless Multi-Nano-Layered Fiber Preparations” <i>George A. Grozdits</i>, Louisiana Tech 	<p>9:00 – 10:30 AM</p> <p><u>Session 13</u> Applications Roundtable I Panel Moderator: <i>Phil Jones</i>, Imerys</p> <ul style="list-style-type: none"> • “Fibrous/Engineered Fillers for the Paper Industry” <i>Pete Lancaster</i>, University of Washington/GR International • “Preparation and Physical Properties of Superhydrophobic Paper Products” <i>Yulin Deng</i>, Georgia Institute of Technology • “Nanotechnology for Military Rations” <i>JoAnn Ratto</i>, US Army Natick Soldier Research, Development & Engineering Center
<p>10:45 AM – 12:15 PM</p> <p><u>Session 14</u> Nanomaterials, Properties, and Applications Session Chair: <i>Tim Rials</i>, University of Tennessee</p> <ul style="list-style-type: none"> • “Self-Assembly of Carbohydrate Based Nanoscale Materials” <i>Joe Bozell</i>, University of Tennessee • “Manufacture of Nanocellulose by High-Pressure Homogenizer” <i>Sun Young Lee</i>, Korea Forest Research Institute • “Application of Nanoindentation to Paper” <i>Robert Rowlands</i>, University of Wisconsin-Madison 	<p>10:45 AM – 12:15 PM</p> <p><u>Session 15</u> Self-Assembly/Biomimicry Session Chair: <i>Ron Sabo</i>, USFS Forest Products Laboratory</p> <ul style="list-style-type: none"> • “Novel Developments and Opportunities with Nanocrystalline Cellulose” <i>Wadood Hamad</i>, Paprican • “Nanocatalysts for Wood Conversion” <i>Philip Kersten</i>, USFS Forest Products Laboratory • “Nanoparticles Secreted from Ivy rootlets for Surface Climbing and Inspirations for Potential Industrial Applications” <i>Mingjun Zhang</i>, University of Tennessee

12:30 – 2:00 PM **Lunch**

Session 16 – “Greening the US Army”

Keynote Speaker: *JoAnn Ratto*, US Army Natick Soldier Center

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<p>2:15 – 3:45 PM <u>Session 17</u> Nanocomposites Session Chair: <i>John Simonsen</i>, Oregon State University</p> <ul style="list-style-type: none"> • “Cellulose Infiltrated Carbon Nanotube Composites as Supercapacitors and Batteries” <i>Trevor Simmons</i>, Rensselaer Polytech Institute • “Cellulose Nanocrystal Reinforced Polyolefin Composites” <i>Ronald C. Sabo</i> USFS Forest Products Laboratory • “A DNA Based Method for Directed Self Assembly of Cellulose Nanocrystals into Advanced Nanomaterials” <i>John Simonsen</i>, Oregon State Univ. 	<p>2:15 – 3:45 PM <u>Session 18</u> Nanotechnology Resource Centers Session Chair: <i>Robert Moon</i>, USFS Forest Products Laboratory/Purdue University</p> <ul style="list-style-type: none"> • “NanoHUB.org: Cyberinfrastructure for Nanotechnology Research and Education” <i>Robert Moon</i>, USFS Forest Products Laboratory/Purdue University • “The Physiological Sensing Facility: Development of Advanced Research Technology for Biological Sensing” <i>Rameez Chatni</i>, Purdue Univ. • “The Nanobiotechnology Center at Cornell University: Research, Outreach, and Knowledge Transfer” <i>Harvey Hoch</i>, Cornell University
<p>4:00 – 5:30 PM <u>Session 19</u> Nanostructure/Nanoscale Optical, Mechanical, Thermal and Electrical Interactions/Nanosensors Session Chair: <i>Umesh Agarwal</i>, USFS Forest Products Laboratory</p> <ul style="list-style-type: none"> • “Electrical and Photoelectrical Properties of Polyaniline Modified Poly (vinylidene fluoride) Latex Films” <i>Gururaj M. Neelgund</i>, Western Michigan University • “Embedding of Carbon Nanotubes on Silicon Substrates for Use in Solar Cells” <i>Abhishek Kumar</i>, Stanford University • “Interaction of Water and Cellulose Aggregate Fibrils During Isothermal Drying as Characterized by High Resolution Thermogravimetric Analysis” <i>Richard Venditti</i>, NC State University 	<p>4:00 – 5:30 PM <u>Session 20</u> Grant Programs in Nanotechnology R&D Panel Moderator: <i>Catalino Blanche</i>, USDA CSREES</p> <ul style="list-style-type: none"> • <i>Martha Otto</i>, Environmental Protection Agency (EPA) • <i>Hongda Chen</i>, USDA CSREES • <i>Ehr-Ping HuangFu</i>, Department of Energy/ITP • <i>Anne Chaka</i>, National Institute of Standards and Technology

5:45 – 7:30 PM

Session 21 Conference Pub

Conference Reception, Poster Session and Vendor Displays II

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Session 22 – “Nanotechnology: Important Link between Trees and Airplanes”

Keynote Speaker: *Mike Postek*, National Institute of Standards and Technology (NIST)

<p>9:00 – 10:30 AM</p> <p>Session 23 AF&PA Agenda 2020 – Panel Discussion Panel Moderator: <i>John Cowie</i>, AF&PA Agenda 2020</p> <ul style="list-style-type: none"> • “Cross-Industry Issues in Nanomaterials Manufacturing Workshop” <i>Anne Chaka</i>, National Institute of Standards and Technology • “Predictive Modeling Consortium” <i>Steve Masia</i>, Sappi Fine Paper • “Agenda 2020 Technology Alliance – Nanotechnology Initiative” <i>Phil Jones</i>, Imerys • “DOE-ITP Nanomanufacturing Issue” <i>Ehr-Ping HuangFu</i>, US Department of Energy, ITP • “Nanotechnology in Food Packaging” <i>Hongda Chen</i>, USDA CSREES 	<p>9:00 – 10:30 AM</p> <p>Session 24 Colloid/Surface Science II Session Chair: <i>Orlando Rojas</i>, North Carolina State University</p> <ul style="list-style-type: none"> • “From Nano to Paper Machine Scale” <i>Joakim Carlen</i>, Eka Chemicals • “The Production of Cellulose Nanofibers from Wood Pulps” <i>Ryan H. Mills</i>, University of Maine • “Nanofibrillated Cellulose Fibers: Where Size Matters in Opening New Markets to Nanofiber Usage” <i>Edward C. Homonoff</i>, Edward C. Homonoff & Associates
<p>10:45 AM – 12:15 PM</p> <p>Session 25 Characterization and Measurement of Nanoscale Structures and Properties II Session Chair: <i>Jim Beecher</i>, USFS Forest Products Laboratory</p> <ul style="list-style-type: none"> • “Characterization of Cellulose Nanocrystal Surfaces by SPM” <i>Robert Moon</i>, USFS Forest Products Laboratory/Purdue University • “Nanomechanical Properties of Wood Cell Walls as Affected by Wood Processing” <i>Cheng Xing</i>, University of Tennessee • “Characterization of Non-derivatized Plant Cell Walls Using High-resolution Solution-state NMR Spectroscopy” <i>Daniel J. Yelle</i>, USFS Forest Products Laboratory 	<p>10:45 AM – 12:15 PM</p> <p>Session 26 Applications Roundtable II Panel Moderator: <i>Phil Jones</i>, Imerys</p> <ul style="list-style-type: none"> • “A Nanotechnology-Driven, Computer-Controlled Highly Sustainable Process for Making Paper and Board” <i>John Penniman</i>, Paper Chemistry Laboratory, Inc. • “Characterization of Wood Polymer Nanocomposites Made of Melamine-Urea-Formaldehyde and Layered Silicate Clays” <i>Xiaolin Cai</i>, FPIInnovations - Forintek • “Nanocomposites Coatings for Wood Flooring” <i>Veronic Landry</i>, FPIInnovations - Forintek

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<p>12:30 PM – 2:30 PM <u>Session 27</u> Working Lunch Interest Group/Focus Group I Paper Coatings Panel Moderator: <i>Tony Lyons</i>, Imerys</p>	<p>12:30 PM – 2:30 PM <u>Session 28</u> Working Lunch Interest Group/Focus Group II Liberation and Characterization of Cellulose Nano-Crystals Panel Moderators: <i>Alan Rudie</i>, USFS Forest Products Laboratory & <i>Steve Masia</i>, Sappi Fine Paper</p> <ul style="list-style-type: none">• <i>Rick Reiner</i>, USFS Forest Products Laboratory• <i>Richard Berry</i>, FPIInnovations• <i>Robert Moon</i>, USFS Forest Products Laboratory/Purdue University
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2:45 PM – 4:00 PM

Steering Committee Meeting

Review/Critique of 2008 Conference and Planning for 2009 – Jones/Wegner & Steering
Committee