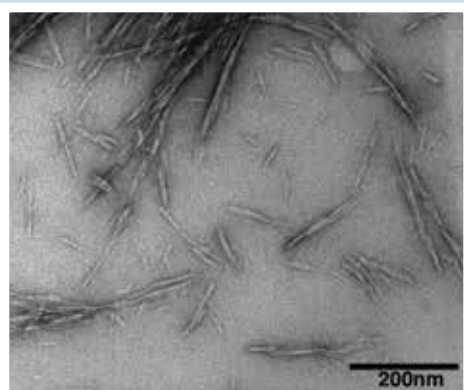


# 2014 TAPPI INTERNATIONAL CONFERENCE ON NANOTECHNOLOGY FOR RENEWABLE MATERIALS

[WWW.TAPPI.ORG/14NANO](http://WWW.TAPPI.ORG/14NANO)



23-26 JUNE 2014 • FAIRMONT HOTEL VANCOUVER  
VANCOUVER, BRITISH COLUMBIA, CANADA



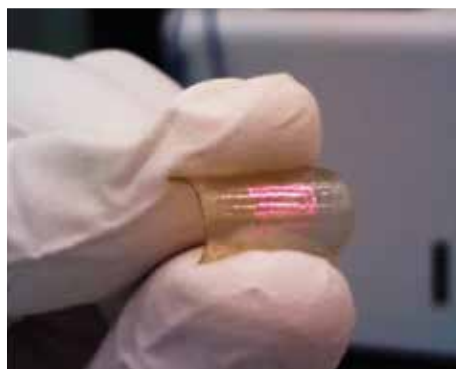
## Unlock the Potential of Nature's Building Blocks

- Renewable
- Sustainable
- Versatile



## At the 2014 Conference:

- Learn about the latest technical advances and applications
- Meet technical experts and business leaders from around the globe
- Join the conversation



## A Unique Opportunity:

- 85 presentations, 50 posters
- Over 200 delegates from around the world
- Facility tours
- Two workshops



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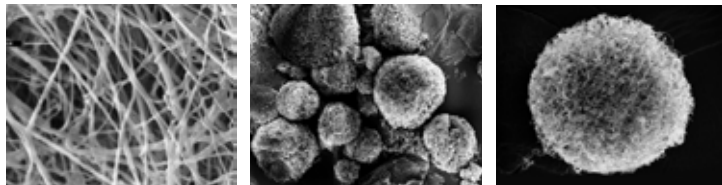
Nanotechnology Now  
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# 2014 TAPPI INTERNATIONAL CONFERENCE ON NANOTECHNOLOGY FOR RENEWABLE MATERIALS

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## Cellulose Nanocrystals

as strong as steel, renewable, a liquid crystal  
New functionalities via nanotechnology for:



- Bioactive Materials
- Catalysts
- Composites
- Flexible, Barrier, and Printed Films
- Membranes and Filters
- Optical Devices
- Paints, Varnishes, Coating
- Rheological Modifiers
- Thermoplastics

Join over 200 delegates, from over 25 countries, representing 50+ paper and chemical companies to:

- Hear the latest discoveries
- Discover the newest functionalities
- Learn about the newest techniques
- Meet experts to advance your research and projects

## Peer-Reviewed Programming

- Conference Co-Chairs:
  - Wadood Y. Hamad, FPIInnovations (Canada)
  - Akira Isogai, Univ. of Tokyo (Japan)
  - Orlando Rojas, NCSU (USA) and Aalto University (Finland)
- Theme Leaders:

Yaman Boluk	University of Alberta
Emily Cranston	McMaster University
Hamdy Khalil	Woodbridge Foam Corporation
Andriy Kovalenko	NRC
Robert Moon	USDA-FPL
Kim Nelson	American Process
Brian O'Connor	FP Innovations
David Plackett	University of BC
Alan Rudie	USDA-FPL
John Simonsen	OSU

## Showcase Your Capabilities & Show Your Support in 2014!

Gain awareness for your company's products, key competencies and services through exhibiting and sponsorship opportunities at this year's conference. **See all the details in the Prospectus located at [www.tappi.org/14nano](http://www.tappi.org/14nano).**

**Tabletop Exhibits** – meet and interact with conference attendees in a one-on-one setting.

**For high visibility, check out the new Capabilities Presentations.**



These 20-minute speaking slots during a seated lunch for all conference attendees give your organization an idea setting to showcase core capabilities, products, and achievements.

**Show your support!** New for 2014, **student sponsorships** are available. Show your support for this emerging technology area by sponsoring a TAPPI Student Chapter member.

## Join TAPPI's International Nanotechnology Division!



Advance the Responsible and Sustainable Production and Use of Renewable Nanomaterials through the Nano Division, which

provides a global forum for the community of individuals, organizations, and institutions interested in:

**Advancing Research** – Offering forums, networks, and tools to share technical information and research needs to foster collaborations that advance the understanding and use of nanomaterials.

**Promoting Nanomaterials** – Promote the benefits and applications of renewable and sustainable nanomaterials both within and outside the forest products industry.

**Supporting Commercialization** – Work to facilitate the development of commercial opportunities by providing forums to discuss applications and the development of standards and other programs to facilitate international trade.

Three teams – Technical Program Team, Marketing & Promotions Team, Product Resources & Development Team – are lead by experts from around the world to further the Division's mission. Join the Division and one of these teams to expand your network and contribute to this growing field.

Visit [www.tappinano.org](http://www.tappinano.org) to join and learn more!

# 2014 TAPPI INTERNATIONAL CONFERENCE ON NANOTECHNOLOGY FOR RENEWABLE MATERIALS

## Conference Highlights

### High Impact Keynotes



#### Allan (Al) Ward

Chief Operating Officer,  
Alberta-Pacific Forest Industries Inc.

Al Ward is President and COO of Alberta-Pacific Forest Industries Inc. (Al-Pac), the newest, largest single line kraft pulp mill in North America, with production starting in 1993. Mr. Ward has a Masters Degree in Business Administration from the University of Alberta and over 30 years of experience in the forest industry in various production, technical and senior management positions. The company utilizes some of the latest advances in chemical pulping technology and annually produces approximately 650,000 tonnes of northern bleached hardwood and softwood kraft pulp. Al-Pac is known as an environmental leader, practices sustainable forest management and was third party FSC certified in 2005 and SFI dual certified in 2013. The company employs 450 full time employees and approximately 1,000 contractors and has been voted one of Canada's "Top 100 Employers for 2014" and one of "Alberta's Top 60 Employers for 2013" for seven years running.



#### Per Svending

Commercial Director  
Imerys FiberLean™

Per has worked 35 years for the paper industry. After chemical engineering studies in Gothenburg Sweden he joined Eka Chemicals (today AkzoNobel) in 1979 and was part of the team that developed the first nano-particle based retention aid system, Compozil. His work at Eka Chemicals gradually progressed from R&D to wet end application and into commercial roles via a period in product management. In 1989 he joined Stora Papyrus Mölndal for a role as technical manager, coated papers. The combination of wet end and coating experience facilitated a move to English China Clays in 1994. The career in what has now become Imerys started as sales director for Scandinavia and has moved through various key account manager roles to product management and global marketing to the current role in the FiberLean™ team. Per was one of the inventors of the FiberLean™ process and is now heading up the commercialisation effort for this breakthrough technology. Off-duty, his favourite activities are motorcycling, skiing, kayaking and cooking.

### Conference Gala On Board The Corporate Yacht

18:30 – 22:00 Wednesday, 25 June 2014

**Additional \$75 Registration Required.** Includes drinks, dinner, dessert and beautiful views of Vancouver.



Join us on board The Corporate Yacht as we follow the sunset and view Vancouver's glimmering shoreline. After initial boarding, the yacht will cruise out of Coal Harbour past the spectacular Vancouver cityscape, Convention

Centre, and famous Pan Pacific Sails. We then will cross over to North Vancouver and cruise past the scenic shoreline, under the Lions Gate Bridge and past Stanley Park's spectacular forests. The yacht will then make its way past the Jericho/Kitsilano beaches and into the Granville Island waterway, before turning us around for our journey back to the Coal Harbour marina at ScienceWorld.

### Student Poster Competition



Each year the Student Poster competition draws multiple submissions. Winners are announced at the conference, and cash prizes and certificates are awarded to

first and second place team members. This year's Student Poster Competition is sponsored by Verso Paper.

### Tour Two State of the Art Facilities

#### The Advanced Materials and Process Engineering



Laboratory (AMPEL) at the  
University of British Columbia

9:00 and 11:00 Monday, 23 June 2014

*Space is limited and pre-registration is required.*

*Buses to depart hotel at 8:30 and 10:30*

AMPEL brings together over 20 faculty members from across the UBC campus to focus on leading edge research of materials, devices and processing sciences. Tour participants will hear an overview of AMPEL, and then visit the Flexible Electronics and Energy Lab (FEEL), the Interface Analysis Lab, the Mechatronics Lab, the Biomaterials Lab, the Composite Lab, the Nanofibres Lab, and the Advanced Fibrous Materials Lab.

### TRIUMF

14:00-16:00 Monday, 23 June 2014

*Space is limited to 50 participants and pre-registration is required.*

*Buses to depart hotel at 13:30.*

TRIUMF is one of the world's leading subatomic physics laboratories, and Canada's national laboratory for nuclear and particle physics research and related sciences. It is a Canadian success story located on the campus of the University of British Columbia in Vancouver. TRIUMF has research programs in accelerator physics, nuclear medicine, detector development, molecular and materials science, particle physics, and rare isotope beams.

### Participate in Developing Standards at the Standards Workshop

12:30-16:00 Thursday, 26 June 2014

In its fourth year, this workshop provides a forum for international communication and collaboration in developing standards for cellulose nanomaterials. Updates on standards in development, plus working groups to advance the research needed to support standards development are a part of this workshop. No additional fee required.

### NIST Workshop – Metrology Needs for Cellulose Nanomaterials

8:00 – 15:00 Monday, 23 June 2014

*Additional \$175 Registration Required.*

**NIST** The U. S. National Institute of Standards and Technology is hosting a special workshop to focus on the most important metrology needs facing the cellulosic nanomaterials community. The agenda will begin with presentations from invited manufacturers who will share their metrology needs and efforts. Additional invited researchers and product development stakeholders will discuss their unique needs. Breakout sessions will task participants with developing prioritized lists of the different metrology needs of the various stakeholders. A workshop report authored by the co-organizers will be published following the meeting.

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## Technical Program

(Subject to Change. To view the most current program schedule go [www.tappi.org/14nano](http://www.tappi.org/14nano))

### Monday, 23 June 2014

18:30 - 19:30 Welcome Reception at the Fairmont Hotel Vancouver

### Tuesday, 24 June 2014

#### Session 1 Welcome & Keynote Presentation

8:00 - 8:50 **Session Chair: OPEN**

Keynote Presentation:

*Al Ward, Chief Operating Officer, Alberta-Pacific Forest Industries Inc.*

#### Session 2 CNC Processing

9:00-10:30 **Session Chair: OPEN**

- "Blue Goose Biorefineries Inc. Method for Cellulose Nanocrystals Production" - **Sean McAlpine**, Blue Goose Biorefineries, Inc.
- "Kinetics of Acid Hydrolysis of Bleached Eucalyptus Pulp for the Production of Cellulose Nanocrystals (CNCs)" - **Junyong Zhu**, US Forest Products Laboratory
- "Low Cost Co-Production of Cellulose Nanofibrils and/or Cellulose Nanocrystals with Biofuels Using American Process Inc.'s AVAP® Biorefinery Technology" - **Kimberly L. Nelson**, American Process Inc.
- "Isolation of a Novel, Crystalline Cellulose Material from the Spent Liquor of Cellulose Nanocrystals (CNCs)" - **Thomas Q. Hu**, FPIInnovations

#### Session 3 Aerogels, Hydrogels and Foams I

9:00-10:30 **Session Chair: OPEN**

- "Applications of Nano Crystalline Cellulose Foams in Composites and Construction" - **Shaul Lapidot**, Melodea Ltd.
- "Ultralight Carbon Aerogel From Microfibril Cellulose as Highly Selective Oil Absorption Materials" - **Yujie Meng**, University of Tennessee
- "Injectable Hydrogels and Low Density Aerogels Crosslinked with Hydrazone Bonds" - **Emily Cranston**, McMaster University
- "Nano-CELLULOSE as a Template for Functional Materials Production" - **Ahu Gumrah Dumanli Parry**, University of Cambridge

10:30 - 11:00 BREAK

#### Session 4 CNF Processing

11:00 - 12:30 **Session Chair: Sean Ireland**, Verso Paper Corp.

- "Fibrillated Cellulose Production – Chemically Assisted Disintegration of the Fiber Cell Wall" - **Thaddeus Maloney**, Aalto University
- "Commercial System to Produce Cellulose Nanofibrils" - **Marc Gerrer**, GL&V
- "Avoiding Aggregation During the Drying and Rehydration Phases of Nanocellulose Production" - **Evelyn Fairman**, University of Maine
- "Unique Properties of TEMPO-Oxidized Cellulose Nanofibers Prepared from Various Plant Holo-celluloses" - **Akira Isogai**, University of Tokyo

#### Session 5 Aerogels, Hydrogels and Foams

11:00 - 12:30 **Session Chair: OPEN**

- "The Structure and Properties of Cellulose Nanocrystal Aerogels" - **Christian Buesch**, EMPA
- "Cellulose Nanofibril Networks: Formation and Applications Towards Composites and Hydrogels" - **Hong Dong**, U.S. Army Research Laboratory
- "Highly Translucent and Tough Bulky Aerogels Prepared from Liquid-Crystalline Nanocellulose Dispersions" - **Tsuguyuki Saito**, The University of Tokyo
- "Cellulose Nanofibrils in Composite, Aerogel, and Carbon Material Applications" - **Long Jiang**, North Dakota State University

12:45 - 13:45 LUNCH ON YOUR OWN

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## Session 7 Alternative Sources for Cellulose

14:00 - 15:30 Session Chair: OPEN

- "Cellulose Nanofibers as an Opportunity for Pulp & Paper Industries, Biorefineries, and Low Value Cellulosic Materials" - **Gilberto Siqueira**, EMPA
- "Unusually High Aspect Ratio, Easily Deconstructed Cellulose Nanofibers from Australian Spinifex (*Triodia Pungens*)" - **Darren Martin**, University of Queensland
- "Preparation Nanocrystalline Cellulose from Corn Stalk Cuticle and the Application in Edible Ink" - **Jiajie Bo**, Dalian University of Technology
- "Synthesis and Characterization of Cellulose Nanocrystal from Acacia Wood" - **Keshaw Ram Aadil**, Guru Ghasidas Vishwavidyalaya

## Session 8 Composites I

14:00 - 15:30 Session Chair: OPEN

- "Surface Modification of Nanocellulose of Polypropylene and Polyethylene" - **Hiroyuki Yano**, Kyoto University
- "Processing-Structure-Property Relationships in Cellulose Nanocrystal/Waterborne Epoxy Composites" - **Meisha Shofner**, Georgia Institute of Technology
- "Supramolecular EcoBioNanocomposites Incorporating Stereocomplexation" - **John R. Dorgan**, Colorado School of Mines
- "Solid-State Shear Pulverization as Effective Treatment for Dispersing Lignocellulose Nanofibers in Polypropylene Composites" - **Shinichiro Iwamoto**, National Institute of Advanced Industrial Science and Technology

15:30 - 16:00 BREAK

## Session 9 Cellulose Nanoparticle Characterization

16:00 - 17:30 Session Chair: OPEN

- "On the Cellulose Supramolecular Structure in Various Cellulose-I CNCs" - **Umesh P. Agarwal**, US Forest Products Laboratory
- "CNC Characterization: An Essential Step Towards Profiling Physicochemical Properties" - **Christophe Danumah**, Alberta Innovates - Technology Futures
- "A Rapid, Reliable Method for Quantifying Cellulose Nanocrystal Sulfate Half-Esters by Conductometric Titration" - **Stephanie Beck**, FPInnovations
- "Recent Developments in Nano-Ligno-Cellulose Production and the Crill Characterization Technique" - **Sinke Henshaw Osong**, Mid Sweden University

## Session 10 Composites

16:00 - 17:30 Session Chair: OPEN

- "Structural Nanocellulose Composites" - **Jeffrey P. Youngblood**, Purdue University
- "Nano-Reinforcement Effects of Polyacrylamide for Nanocellulose Films" - **Takanori Kurihara**, Harima Chemicals, Inc.
- "Improvements in Mechanical Response and Liquid Barrier Properties of Cellulosic Substrates with Blended Polysaccharide Coatings" - **Adam R. Plucinski**, Pennsylvania State University
- "A Hierarchical Carbon Nanofiber-In2S3 Photocatalyst with Well Controlled Nanostructures for Highly Efficient Hydrogen Production Under Visible Light" - **Peng Gao**, Nanyang Technological University

## Session 11 Poster Session

17:30-19:30 Session Chair: OPEN

Wednesday, 25 June 2014

## Session 12 Keynote: Commercial Break-Through in MFC Processing

8:00 - 8:45 *Per Svending*, Commercial Director, Imerys FiberLean™

Session Chair: OPEN

## Session 13 Markets for Cellulose Nanomaterials

9:00-10:30 Session Chair: Alan Rudie,  
US Forest Products Laboratory

- "Pre-Commercial Plant of Cellulose Nano Fiber in Nippon Paper Industries" - **Haruo Konno**, Nippon Paper Industries Co. Ltd.
- "Market Projections for Nanocellulose-Enabled Products" - **Jo Anne Shatkin**, Vireo Advisors
- "Nanocellulose Markets" - **Jack Miller**, Market-Intell LLC

## Session 14 Hybrid Composites

9:00-10:30 Session Chair: OPEN

- "Functionalized Nanocellulose as a Reinforcement and pH Detector on PVA films" - **Claudia Ponce**, IPN
- "Biorenewable Blends Exhibiting Crystallization Induced Phase Separation" - **John Dorgan**, Colorado School of Mines
- "Electrospun Chitosan-Polyethylene Oxide Nanofibres for Adsorption of Copper Ions from Aqueous Solutions" - **Ichhak Lakhthar**, UQTR
- "Chemical Surface Analysis and Classification of Hydrophobic Nanoparticle Coatings on Paper by Principal Component Analysis" - **Pieter Samyn**, University of Freiburg

10:30 - 11:00 BREAK

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## Session 15

### Applications

11:00 - 12:30

**Session Chair:** *Alan Rudie,*  
*US Forest Products Laboratory*

- "Nanocellulose-Based Renewable Materials of Interest in Food Packaging Applications" - *Jose Maria Lagaron,* *Instituto De Agroquimica Y Tecnologia De Alimentos*
- "Energy and Electronics Devices Based on Cellulose Nanostructures" - *Liangbing Hu,* *Univeristy of Maryland-College Park*
- "Mitigating Shrinkage in Concrete Structures through Cellulose Nanomaterials" - *Vivek Bindiganavile,* *University of Alberta*
- "Cellulose Nanofibrils in Composite, Aerogel, and Carbon Material Applications" - *Long Jiang,* *North Dakota State University*

## Session 16

### Rheo I

11:00 - 12:30

**Session Chair:** **OPEN**

- "Rheological Studies on the Interactions Between Cellulose Nanocrystals and Polymers" - *Liyan Zhao,* *Alberta Innovates Technology Futures*
- "The Blade Coating of Cellulose Nanofibers Suspensions on Paper" - *Finley Richmond,* *University of Maine*
- "Tuning Cellulose Nanocrystal Gels and Emulsions using Polymers and Surfactants" - *Emily Cranston,* *McMaster University*
- "Change in Rheological Properties of Nanofibrillated Cellulose Suspension with Additives" - *Kyujeong Sim,* *Seoul National University*

12:45 - 13:45

LUNCH ON YOUR OWN

## Session 18

### Paper & Paperboard Applications

14:00 - 15:30

**Session Chair:** **OPEN**

- "The Addition of CNF to Papermaking Furnish" - *Donna A. Johnson,* *Univeristy of Maine*
- "Development of microfibrillated cellulose composite web forming method" - *Jukka T. Pirttiniemi,* *Aalto University*
- "Impact on paper properties of z-direction structuring by the layered addition of Micro-Nano-Fibrillated Cellulose (MNFC)" - *Mohamed A. Charfeddine,* *Centre Integre En Pates Et Papier*
- "Binding fillers for high filler content papers by using MFC" - *Katariina Torvinen,* *VTT Technical Research Centre of Finland*

## Session 19

### Rheo II

14:00 - 15:30

**Session Chair:** **OPEN**

- "Control of Colloidal Structure Using Polyelectrolytes to Improve Filtration and Sheet Porosity" - *Warren J. Batchelor,* *Monash University*
- "Stability and Rheology of Cellulose Nanocrystal Solutions in Absorbing and Non-Absorbing Polymers Solutions" - *Hale Oguzlu,* *University of Alberta*
- "Dispersion of Micro-Nano Fibrillated Cellulose (MNFC) by Carboxy Methyl Cellulose (CMC) and Its Characterization" - *Fabrice Roussiere,* *UQTR/CRML*
- "Rheology and Consolidated Structure of MFC/NFC-containing Coating Colours: Structure-Liquid interactions" - *Katarina Dimic-Misic,* *Aalto University*

15:30 - 16:00

BREAK

## Session 20

### Medical I: Biomedical Scaffolds from Cellulose

16:00 - 17:30

**Session Chair:** **OPEN**

- "Design and Fabrication of Nanocellulose-Based 3D Scaffolds as Alternative Orthopedic Biomaterials" - *Vanja Kokol,* *University of Maribor*
- "Tissue Engineering Scaffolds from Electrospun All-Cellulose Nanocomposite Nanofibers Reinforced with Cellulose Nanocrystals" - *Wei Zhang,* *University of Sichuan*
- "Biofunctional Micropatterning of Glyco-decorated Scaffolds Affects Myoblast Cell Alignment" - *Pornthida Poosala,* *Kyushu University*
- "Morphological, Structural, Mechanical Performance and In Vitro Bioactivity of Cellulose Nanocrystals Reinforced Biocomposite Scaffolds for Bone Tissue Engineering" - *Yuvraj Singh Negi,* *IIT Roorkee*

## Session 21

### CNC Self Assembly

16:00 - 17:30

**Session Chair:** *Emily Cranston,* *McMaster University*

- "Cellulose Nanocrystal Self-Assembly into Flexible Films of Tunable Photonic" - *Wadood Hamad,* *FPIInnovations*
- "Cellulose Nanocrystal Self-Assembly and Liquid Crystal Behaviour During Storage" - *Stephanie Beck,* *FPIInnovations*
- "Cellulose Biomimetic: A New Prospective for Smart Materials" - *Silvia Vignolini,* *University of Cambridge*
- "Responsive Photonic Hydrogels Templated by the Self-Assembly of Cellulose Nanocrystals" - *Joel A. Kelly,* *University of British Columbia*

18:30 - 22:00

Conference Dinner Gala On Board The Corporate Yacht. Additional \$75 Registration Required.

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Thursday, 26 June 2014

Session 24

**Medical II: Drug Delivery**

9:00-10:30

**Session Chair: David Plackett**, University of British Columbia

- "Nanocelluloses and Drug Delivery – A Concise Review" - **David Plackett**, University of British Columbia
- "Nanofibrillar Cellulose in Controlled Drug Release" - **Timo Laaksonen**, University of Helsinki
- "Prep and Characterization of Cellulose Nanofibril Based Hydrogels for Drug Release Systems" - **Byung-Dae Park**, Kyungpook National University
- "Formulation and Evaluation of Capecitabine Loaded Nanoparticles for Cancer Therapy" - **Santhanam Ramesh**, Nehru College of Pharmacy

Session 25

**Surface Functionalization**

9:00-10:30

**Session Chair: OPEN**

- "(Bio)Chemical Approaches to (Bio)Functional Cellulose: Application of Carbohydrate Enzymology and Cell Wall Biomimetics to Cellulose Surface Modification" - **Harry Brumer**, University of British Columbia
- "Synthesis and Heterogeneous Catalysis of Metal Nanocatalysts on TEMPO-Oxidized Cellulose Matrix" - **Takuya Kitaoka**, Kyushu University
- "Thermally Stable Cellulose Nanocrystals: From Form to Smart Functionality" - **Johan Foster**, University of Fribourg
- "Silver Nanoparticles on Paperboard for Surface-Enhanced Raman Scattering (SERS) Sensing" - **Jarkko J. Saarinen**, Abo Akademi University

10:30 - 11:00

BREAK

Session 26

**Medical III: Antimicrobial & Antibacterial Functionality**

11:00 - 12:30

**Session Chair: OPEN**

- "Bioinspired Antimicrobial Strategies: Stolen Solutions from Nature Describing Tribological Interactions" - **James Chapman**, Central Queensland University
- "Synthesis, Characterization and Antimicrobial Activity Assessment of Surface Modified Microfibrillated Cellulose" - **Seema Saini**, Grenoble INP Pagora
- "Elaboration of a New Antibacterial Bio-Nano-Material for Food-Packaging by Synergistic Action of Cyclodextrin and Microfibrillated Cellulose" - **Julien Bras**, Grenoble INP Pagora
- "Antimicrobial Propolis Containing Biocellulose Membranes for Skin Wound Healing" - **Hernane Berud**, Universidade Estadual Paulista (UNESP)

Session 27

**Modeling**

11:00 - 12:30

**Session Chair: Andriy Kovalenko**, National Institute for Nanotechnology

- "Interaction Forces Between Cellulose Nanocrystal Particles in Aqueous Solutions" - **Yaman Boluk**, University of Alberta
- "Mechanical Characterisation of Nano Fibrillar Cellulose Foams Using X-ray Tomography and Numerical Simulations" - **Prashanth Srinivasa**, KTH Royal Institute
- "The Strength of Microfibrillated Cellulose Sheet Materials" - **Warren J. Batchelor**, Monash University
- "Plant Biomass Recalcitrance: Molecular Theory of Solvation Reveals Nanoscale Forces that Control Cell Wall Strength" - **Andriy Kovalenko**, National Institute for Nanotechnology

12:45 - 13:45

LUNCH

Session 28

**Medical IV: EHS**

14:00 - 16:00

**Session Chair: OPEN**

- "Effect of Polymeric Nanoparticles on the Stability of a Biomimetic Model of the Lung Surfactant" - **Weiam Daear**, University of Calgary
- "Nanocellulose's Low Toxicity as Measured by Zebrafish Assays" - **Christian Buesch**, Oregon State University

Session 29

**Standardization Workshop**

14:00 - 15:30

**Session Chair: OPEN**

- Discussion and coordination of standards development to support the commercial use of cellulose nanomaterials. TAPPI's International Nanotechnology Standards Coordination Committee (INSCC) primary role is to facilitate communication among the many standards-developing organizations, and to coordinate efforts.

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## Posters on Display at the Poster Session • Tuesday, 17:30-19:30

Investigation of Near-Field and Far-Field Properties of Gold Spiky Nanoparticle Dimers for High Performance Sensing	Anran Li	Nanyang Technological University
Cellulose Nanocrystals Mediate Silver Nanoparticles Formation by Controlling Nucleation process -	Arcot R. Lokanathan	Aalto University
Unusually High Aspect Ratio, Easily Deconstructed Cellulose Nanofibers from Australian Spinifex (Triodia Pungens)	Darren Martin	The University of Queensland
Oxidized Celluloseelation with Alcohols and Sodium Dodecyl Sulfate	Duygu Celebi	Universit of Bath
Carboxylated Cellulose Nanocrystals with Different Rates of Carboxylate Surface Moieties	Fany Hoeng	Grenoble-INP Pagora-LGP2
Nanofibrillated Cellulose for Exterior Wood Coatings – A Feasibility Study	Franziska Grueneberger	Empa, Swiss Federal Laboratories for Materials Science and Technology
Glyco-Decorated Biointerface Directly Stimulates the Intracellular Signaling of Cultured Cells	Fumi Uemura	Kyushu University
Preparation and Characterization of Cellulose Acetate Composite Membranes Blended with Nano Crystalline Cellulose	Haolong Bai, PhD	Beijing Forestry University
Direct Nanowelding of Cellulose Fibers	Hossein Yousefi	Gorgan University of Agriculture Sci @ Natural Res.
Flocculation Behavior of Nanofibrillated Cellulose with Addition of Salt	Hye Jung Youn	Seoul National University
Dewatering of Nanofibrillar Cellulose Suspension with Additives	Hye Jung Youn	Seoul National University
Contact-Free Determination of Coefficient of Thermal Expansion of Soft Materials	Jairo A. Diaz A.	Purdue University
Preparation Nanocrystalline Cellulose from Corn Stalk Cuticle and the Application in Edible Ink	Jiajie Bo	Dalian University of Technology
Study of Cellulose Acetate and Lignin Based Nanofibers Produced by the Electrospinning Technique	Joao Vinicios Wirbitzki Silveira	Federal University of Jequitinhonha and Mucuri Valleys
Supramolecular EcoBioNanocomposites Incorporating Stereocomplexation	John R Dorgan, Ph.D.	Colorado School of Mines
Synergetic Behaviour of Clay and Cellulose Nanofibers on Barrier Properties of PLA Based Nanocomposites	Jon Trifol	Danish Polymer Centre
Cellulose Nanofibril Enhanced Microfiltration Membranes	Judith Margaret Winglee	Duke University
Synthesis and Characterization of Cellulose Nanocrystal from Acacia Wood	Keshaw Ram Aadil	Guru Ghasidas Vishwavidyalaya
Controlling Mechanical and Viscoelastic Properties of Hydrogels by Crosslinking Cellulose Nanofibrils	Kristin Syverud	Paper and Fibre Research Institute, NTNU
PMMA-Grafted CNCs for Use in PMMA Nanocomposites	Lexa Graham	McMaster University
Asymmetric Heterogeneous Hydrogenation Using Palladium Nanoparticles Supported on Cellulose Nanocrystals (CNC): Role of CNCs in Chiral Induction	Madhu Kaushik	McGill University
Imaging Cellulose Nanocrystals by Transmission Electron Spectroscopy	Madhu Kaushik	McGill University
Novel Nano Cellulose Materials	Marcus Ruda	CelluTech AB
CNF and CNF Aerogel Production for Valorization of Residual Empty Palm Fruit Bunch Fibers (EPFBF) by Microfluidization	Mariko Ago	Tokushima Bunri University
"Preparation and Characterization of Cellulose Nanocrystals: Effects of Alkalization"	Jon Trifol	Danish Polymer Centre, Department of Chemical and Biochemical Engineering, Søtofts Plads
Whey Protein Polymerization and Its Applications in Environmentally Safe Adhesives	Masoumeh Hassanzadeh	KTH university
Flow Instabilities During Rheological Measurements of Nanofibrillated Cellulose Aqueous Suspensions	Mingruo Guo	The University of Vermont
Magnetic Microbeads and Capsules Stabilized by Cellulose Nanocrystals	Oleksandr Nechyporchuk	Laboratoire De Genie Des Procedes Papetiers (LGP2)
Laboratory Study of Nanofibrillated Cellulose as Paper Coating Material	Orlando J. Rojas	Aalto University
Organic Solvent-Free Processing of High Performance Polyurethane Nanocomposites Reinforced with Cellulose Nanocrystals	Pekka Salminen	Styron Europe
	Pratheep Kumar Annamalai	Australian Institute for Bioeng. and Nanotech (AIBN)



# 2014 TAPPI INTERNATIONAL CONFERENCE ON NANOTECHNOLOGY FOR RENEWABLE MATERIALS

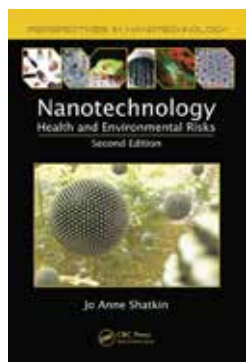
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## Poster Sessions Continued

Resilin-Nano Crystalline Cellulose Epoxy (RNCCE) Composite; A Novel Elastic, Resilient Adhesive	Prof. Oded Shoseyov	The Hebrew University of Jerusalem Israel
Structural Colored Films from Nanocrystalline Cellulose: Influence of Electrolytes on the Chiral-Nematic Organization	Raphael Bardet	LGP2 - Laboratory of Pulp & Paper Science
Toxicity Studies of Nanofibrillar Cellulose in Human Bronchial Epithelial Cells and Macrophages in Vitro	Saila Pesonen	Finnish Institute of Occupational Health
Nanocellulose Forum: Platform to Facilitate Practical Use of Nanocellulose in Japan	Shinichiro Iwamoto	National Institute of Advanced Industrial Science and Technology
Thermal and Mechanical Properties of Surface-Modified Cellulose Nanofibrils/Poly(L-Lactide) Composite Films	Shuji Fujisawa, Ph.D	Forestry and Forest Products Research Institute
All Bio-Composites Composed of Polyamide 11 and Cellulose Nano-Fiber	Takeshi Semba	Kyoto Municipal Inst. of Ind. Tech. and Culture
Transparent NFC Films for Sensing Applications	Vinay Kumar	Abo Akademi University
MFC Films as Controlled Release Systems: Influence of the Chemical Composition	Virginie Bigand	Grenoble INP Pagora
Nanofibrillation of Lignocellulosic Biomass and Their Reinforcing Potential	William Tze	University of Minnesota
Preparation Process Optimization and Characterization of Nano-Crystalline Cellulose from Bamboo Dissolving Pulp	Zhifei Zhuo	Institute of Chemical Industry of Forestry Products
Green Superabsorbent Made from Cellulose Nanofibril Aerogel	Zhiyong Cai	Forest Products Laboratory, USDA Forest Service
Study of Cellulose Reinforced Poly (Lactic Acid) Biocomposites Modified by Organosilane Treatments, and Its Application for Food Packaging	Sofiya Shopova	ITENE, Parque Tecnológico

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These publications from TAPPI are available to the 2014 TAPPI International Conference on Nanotechnology for Renewable Materials attendees at a "Conference Only" discount. You can purchase these books when registering and pick them up when you arrive at the conference.



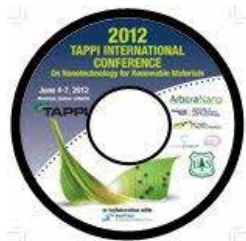
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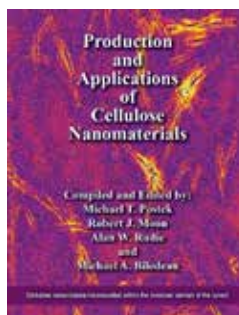
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# 2014 TAPPI INTERNATIONAL CONFERENCE ON NANOTECHNOLOGY FOR RENEWABLE MATERIALS

[WWW.TAPPI.ORG/14NANO](http://WWW.TAPPI.ORG/14NANO)

## Get Out and About In Vancouver

Vancouver offers travellers both outstanding opportunities for outdoor adventure and the sophisticated amenities of a world-class city. Take advantage of the city's oceanside location, with plenty of green space and many recreation opportunities in the mountains 20 minutes north of downtown.

Only have time to do one thing in Vancouver? Cycle or stroll along the Stanley Park seawall, a paved 10km/6mi loop with magnificent mountain, ocean, forest and city views. While in Stanley Park, visit to the internationally-acclaimed Vancouver Aquarium, one of North America's five largest aquariums.

Learn more about our host city at <http://www.hellobc.com/vancouver.aspx>.



## Hotel

### Preferred Hotel

#### Fairmont Hotel Vancouver

900 West Georgia Street  
Vancouver, BC V6C 2W6 CANADA  
Hotel Reservations: +604 684 -3131  
or <https://resweb.passkey.com/go/tappi2014>

Hotel website: <http://www.fairmont.com/hotel-vancouver/>

TAPPI has a limited number of discounted guest rooms

blocked at the Fairmont Hotel in Vancouver.

Rates and information are as follows:

TAPPI has arranged for a discounted rate of 214 CAN + tax at the Fairmont Hotel Vancouver for all conference delegates. In order to take advantage of the negotiated discounted rate, be sure to mention that you are with TAPPI's Nanotechnology Conference when making your reservation. You will also receive complimentary WiFi in all guest rooms.

Important dates: Reservations must be made by **Wednesday, 21 May 2014** in order to receive the TAPPI discounted rate.

### Traveling to Vancouver

Airport: Vancouver International Airport (YVR),  
[www.fairmont.com/hotel-Vancouver](http://www.fairmont.com/hotel-Vancouver) for directions to the hotel from the airport.



# 2014 TAPPI INTERNATIONAL CONFERENCE ON NANOTECHNOLOGY FOR RENEWABLE MATERIALS



[WWW.TAPPI.ORG/14NANO](http://WWW.TAPPI.ORG/14NANO)

## Registration

### Two easy ways to register for the conference:

1. Online at [www.tappi.org/14nano](http://www.tappi.org/14nano)
2. Call TAPPI Member Connection at 1.800.332.8686 (US); 1.800.446.9431 (Canada) or +1.770.446.1400 (Worldwide)

All fees must be paid in US Dollars.

### Wire Transfers

Need to make a Wire Transfer for payment? Call 1.800.332.8686 (US); 1.800.446.9431 (Canada) or +1.770.446.1400 (Worldwide) or email [memberconnection@tappi.org](mailto:memberconnection@tappi.org) for details.

Full Conference**	Before 11 April 2014	12 April to 20 June 2014	After 20 June
Member*	\$955	\$1,105	\$1,197
Nonmember	\$1,230	\$1,435	\$1,674
Join/Renew & Save	\$1,169	\$1,279	\$1,371
Single Day** Member*	\$495	\$495	\$662
Single Day ** Nonmember	\$700	\$700	\$838
Single Day** Join/Renew & Save	\$669	\$669	\$836
Speaker- Full Conference	\$675	\$745	\$857
Retired	\$640	\$640	\$640
Group Discount - Member* (price per person for 3+ from same company)	\$830	\$830	\$954
Group Discount - Non-Member (price per person for 3+ from same company)	\$1,125	\$1,125	\$1,316
Join/Renew & Save Group Discount - price per person for 3+ from same company)	\$1,004	\$1,004	\$1,128
Student **	\$200	\$205	\$215
Spouse/Guest Registration Includes Gala Ticket	\$75	\$75	\$75
Additional Tickets to Gala	\$75	\$75	\$75
NIST Workshop Monday, 23 June 8:00AM – 3:00PM	\$175	\$175	\$175

\*Member discounts are available to members of TAPPI who are in good standing.

\*\* Does not include Gala tickets with registration. Must purchase a separate ticket to attend.

### Cancellation Policy:

If you find that you have to cancel, your full registration fee will be refunded if TAPPI's Registration Department receives written notification (fax acceptable) at +1.770.209.7206 by 11 April 2014. Please note: There will be a 50% refund for all written cancellations made after 11 April 2014 but no later than 5 business days prior to the start of the conference, 16 June 2014. Understandably, after this time, no refunds can be issued. Substitutions, however, will be accepted any time without a penalty.

### Refund:

100% - Cancellation received by 11 April 2014

50% - Cancellations received after 11 April 2014 and no later than 16 June 2014.

NO REFUND- Cancellations received after 16 June 2014.