Cellulose Nanomaterials Will Contribute to Everyday Life

International Conference on Nanotechnology for Renewable Materials • 2017
5 – 8 June 2017 • Montreal, Quebec, Canada
Hyatt Regency Montreal

Program. Speakers. Registration
conference.tappinano.org

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Attend Nano 2017 and See the Future of Cellulose Nanomaterials!

TAPPI Nano 2017 by the numbers:
• 3 keynote presentations
• 40 technical sessions and panels
• 150+ technical presentations
• 300+ attendees

NEW for 2017!
• Hear from End Users such as Cabot Corporation, Ford Motor Company, L’Oreal and Schlumberger
• Career Roundtable
• Student Committee Luncheon (open to all students)
• Health, Safety, and Environmental Considerations for Bio/Nano Technologies Workshop

Nano 2017 Gives You

Expanded Technical Program
Four days of peer-reviewed presentations held in three concurrent tracks gives you more to choose from and allows you to customize your learning opportunities.

Global Reach
Delegates, as well as presenters, come from more than 25 different countries.

Networking Opportunities
Multiple events scheduled throughout the conference allow you to meet industry colleagues and strengthen existing business relationships.

Additional Highlights
3 Keynote Presentations from Industry Leaders, Exclusive Facility Tour, Workshop, Roundtable, Panel Discussion and much more!

Nano offers you networking opportunities and technical presentations on production, characterization, applications and functionalization of renewable nanomaterials.

Join industry experts, scientists, leading researchers, health and safety specialists, and government policy makers from around the world for this dynamic 4-day conference and experience all that NANO 2017 has to offer.

Don’t miss YOUR chance to be part of this informative and highly-rewarding conference.

REGISTER TODAY!
Conference Schedule at a Glance

Monday, 5 June
8:30am - 11:30am  Facility Tour-FP Innovations*
12:30pm - 2:00pm  Student Committee Lunch
1:00pm - 4:00pm  Health, Safety, and Environmental Considerations for Bio/Nano Technologies Workshop*
2:00pm - 4:00pm  ISO TC6 TG1 Meeting (members only)
4:00pm - 5:30pm  Opening Keynote Presentation: Sébastien Corbeil, CelluForce
5:30pm - 7:00pm  Welcome Reception
6:30pm - 7:30pm  Young Professionals Mixer

Tuesday, 6 June
8:30am - 12:00pm  Technical Sessions
12:00pm - 2:00pm  Lunch and Keynote Presentation: Trevor Stuthridge, FPInnovations
2:00pm - 5:30pm  Technical Sessions
5:30pm - 7:30pm  Poster Session and Student Poster Competition

Wednesday, 7 June
7:30am - 8:20am  Research Committee Meeting (members only)
8:30am - 12:00pm  Technical Sessions
12:00pm - 2:00pm  Lunch - Cellulose Presentation
2:00pm - 5:30pm  Technical Sessions
6:00pm - 10:15pm  Conference Dinner Cruise *

Thursday, 8 June
8:30am - 12:00pm  Technical Sessions
12:00pm - 2:00pm  Lunch and Keynote Presentation: John Kozij, Canadian Forest Service
2:00pm - 5:30pm  Technical Sessions

Friday, 9 June
9:00am - 12:00pm  Producers Committee Meeting (members only)

*Separate registration fee required.

Technical Sessions focus on:
(see pages 7-10 for program details, or visit our website, conference.tappinano.org

Applications
• Biomedical Applications - Tissue Engineering and Implants, Wound Dressings and Drug Delivery
• Composites - New and Emerging Infrastructure Applications, Solvent-based, Melt and Dry Processing, Reactive Processing
• Electronics - Photonics and Catalysts, Printed Electronics and Storage Devices
• Paper and Packaging - Cellulose Nanomaterials in Paper, Board and Self-standing Films; Nanocellulose-based Coatings, Packaging Applications

Characterization and Functionality
• Characterization - New Metrology Methods, Intrinsic Property Measurement Quantitative Property Control in Production, Commercial Measurement Needs
• Functional Materials - Emulsions, Foams, Sols & Gels, Filaments & Threads, Mechanisms and Fundamentals
• Surface Mediated Assembly - Colloidal Interactions, Self- and Directed Assembly of CNC’s, Increasing Functionality via Surface Modification

Markets, Production and Safety
• Industrial Production - Production of CNC & CNF, Potential Markets
• EHS – Safety and Sustainability in Applications, Workplace Safety
**Monday 5 June 2017**

4:00pm – 5:30pm • **Sébastien Corbeil**
President & CEO, Celluforce

Corbeil has more than 20 years of international management experience and joined Celluforce in 2015 to speed up the commercialization of nanocrystalline cellulose, an advanced biomaterial extracted from wood fibers. Prior to joining CelluForce, Mr. Corbeil held several leadership positions with the SUEZ Group in Europe where he developed new products, launched new business units and helped reposition ailing companies. He came back to Canada in 2013 and served as Vice-President for EnGlobe Corp, in charge of a major acquisition project. Corbeil started his career as a research engineer in Pulp and Paper with industrial gas giant Air Liquide in Chicago, and he holds a Bachelor’s and a Master’s degree in chemical engineering from McGill University, as well as a MBA from DePaul University.

**Tuesday, 6 June 2017**

12:00pm – 2:00pm • **Dr. Trevor Stuthridge**
Executive Vice President, FPInnovations

At FPInnovations, Stuthridge oversees R&D operations, business development and organisational strategy. He has served as a chairperson, director, strategic advisor or executive manager for a broad range of national and international research initiatives and technology commercialisation opportunities relating to sustainable forest management, wood processing innovation, waste utilisation, environmental risk management, biofuels and bioenergy, clean technologies, climate change, and life-cycle assessment. In addition, he has developed and maintained numerous direct collaborations in academic research, government investment, commercial science and innovation. Trevor holds a Ph.D. in chemistry from the University of Waikato in New Zealand plus executive qualifications in business management and governance. He also serves as an Adjunct Professor at both University of British Columbia and University of Toronto.

**Thursday, 8 June 2017**

12:00pm – 2:00pm • **John Kozij**
Director General of the Policy, Economics and Industry Branch, Canadian Forest Service
Department of Natural Resources, Canada

Prior to joining NRCan in January of 2015, Kozij was the Director General of Land and Environmental Management and the Director General of the Northern Policy and Science Integration Branch at Aboriginal Affairs and Northern Development Canada (AANDC) where a large preoccupation included developing and championing Canada’s Northern Strategy. Prior to joining AANDC in the summer of 2007 as a Northern strategic policy director, he worked at Human Resources and Skills Development Canada (HRSDC) as policy director on Aboriginal skills and training, was a senior officer with the Privy Council Office, and a senior economist with the Canadian International Development Agency. Kozi has a degree in economics from Simon Fraser University and a Masters in economics from Dalhousie University in Halifax.
NEW THIS YEAR!
More Technical Sessions – the Conference Program begins on Monday followed by three full days of technical programming on cellulosic and renewable nanomaterials.

FPInnovations Tour
Monday, 5 June, 2017 • 8:30am - 11:30am
(Separate registration fee required $25)
Kick off your 2017 Nano experience with a tour of FPInnovations! FPInnovations specializes in the creation of scientific solutions in support of the Canadian forest sector’s global competitiveness and responds to the priority needs of its industry members and government partner.

NEW Student Committee and Mentor Lunch
Monday, 5 June, 2017 • 12:30pm - 2:00pm
Designed to help students, postdocs and young professionals make the most of their conference experience by pairing them with global leaders in renewable materials. This is a fun, informal opportunity for students and young professionals to meet, connect and make an impact. Experts will be paired with young professionals to mentor them during the conference. Hosted by TAPPI’s new Student Committee in the Nanotechnology Division. (Register early! Space is limited to 50.)

ISO TC6 TG1 Meeting
Monday, 5 June, 2017 • 2:00pm - 4:00pm
ISO is an independent, non-governmental international organization with a membership of 164 national standards bodies. The TC6 committee focuses on standardization in the field of paper, board, and pulps and cellulosic nanomaterials (CNM), including terminology, sampling procedures, test methods procedures, test methods, product and quality specifications, and the establishment and maintenance of appropriate calibration systems. TC6 will hold its annual meeting at the conference this year. (invitation only)

NEW Health, Safety, and Environmental Considerations for Bio/Nano Technologies Workshop
Monday, 5 June, 2017 • 1:00pm - 4:00pm
(Separate registration fee required
Member: $160; Nonmember: $220)
Lead Instructor: Jo Ann Shatkin, Vireo Advisors, LLC
During this half-day workshop, you’ll learn the occupational, environmental, and consumer health and safety requirements for new technologies, with a special focus on bio-based nanomaterials. Interactive presentations will explore these issues from the perspectives of data development, risk assessment and management strategies, and regulatory requirements. Presentations, case studies, and discussions will be led by the team from Vireo Advisors, an experienced international advising firm dedicated to advancing the commercialization of safer and environmentally preferable technologies. For more details visit the conference website.

Learn more at conference.tappinano.org.
Conference Highlights

Young Professionals Mixer
Hosted by the Young Professionals Division
Monday, 5 June, 2017 • 6:30pm - 7:30pm
Join the YP’s for some fun and laid back networking with the industry’s future leaders. Mixer will be held on the roof top Terrace of the Hyatt Regency Montreal.

NEW End Users Panel
Hosted by the End Users Committee
Tuesday, 6 June, 2017
4:00pm - 5:30pm
TAPPI Nano 2017 contains its first-ever end users panel. This new session is expected to be of wide interests to scientist and producers alike learn about the requirements and issues that the ultimate end user will have when producing commercial products incorporating cellulose nanomaterials.

Poster Session and Student Poster Competition
Coordinated by the Student Committee
Sponsored by: Georgia Tech Renewable Bioprodcts Institute
Tuesday, 6 June, 2017
5:30pm - 7:30pm
View more than 40 presentations that focus on additional applications, characterization and functionalization of cellulose and other renewable nanomaterials. Winners are announced at the conference; cash prizes and certificates are awarded to the first and second place winners.

Research Committee Meeting
(members only)
Wednesday, 7 June, 2017
7:30am - 8:20am

Dinner Cruise
Wednesday, 7 June, 2017 • 6:00pm - 10:15pm
(Separate registration fee required $100
Guest dinner tickets are available - $175)
Join us on board Cavalier Maxim as we view the lights of Montreal while cruising the Saint Lawrence River. Guests will be impressed by the beauty of the city and its surroundings as well as an exceptional dinner. The night concludes with a colorful fireworks display. Register early! Space is limited to 150.
• Bus departs hotel at 6:00 pm
• Cruise departs at 7:00 pm
• Arrive back at Pier at 10:00 pm
• Arrive back at hotel at 10:15 pm

Lunch Presentation
Sponsored by: CelluForce
Thursday, 8 June, 2017 • 12:00pm - 2:00pm
(Presentation Title Goes Here)

NEW Career Roundtable
Sponsored by the TAPPI Student Committee
Friday, 8 June, 2017 • 2:00pm - 3:30pm
The platform will be comprised of two representatives each from academia, government and industry with a member of the student committee as moderator. The first 30 minutes will be a presentation from one of the panelists, then 30 minutes open for Q&A. The final 30 minutes will be dedicated to informal small group discussion where students and young professionals can directly engage with panelist from their job sectors.

Producers Committee Meeting
(members only)
Friday, 9 June, 2017
9:00am - 12:00pm

NEW Student Spotlight
The “Student Spotlight” gives student presenters in both the technical oral sessions and the poster competition an opportunity to showcase their work. The spotlight will cycle through slides highlighting students and young professionals’ photo, bio and key points about their presentations. Attendees will have the opportunity to view the “Student Spotlight” at the student table top during the networking sessions.
## Monday · 5 June 2017

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
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<tbody>
<tr>
<td>8:30-11:30</td>
<td>Tour of FPInnovations</td>
<td>FPInnovations</td>
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<tr>
<td>12:30-2:00</td>
<td>Student Committee Lunch</td>
<td>FPInnovations</td>
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<tr>
<td>1:00-4:00</td>
<td>ISO TC6 TG1 Meeting</td>
<td>FPInnovations</td>
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<tr>
<td>4:00-5:30</td>
<td>Session 1: OPENING SESSION AND KEYNOTE</td>
<td>FPInnovations</td>
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<td></td>
<td>Keynote Speaker: Sébastien Corbeil, CelluForce</td>
<td>FPInnovations</td>
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<td></td>
<td>Welcome &amp; Nano Division Overview</td>
<td>FPInnovations</td>
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<tr>
<td>5:30-7:00</td>
<td>Welcome Reception</td>
<td>FPInnovations</td>
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<tr>
<td>6:30-7:30</td>
<td>Young Professionals Mixer</td>
<td>FPInnovations</td>
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<tr>
<td>8:30-11:30</td>
<td>Session 2: Industrial Application Testing</td>
<td>FPInnovations</td>
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<tr>
<td>8:32</td>
<td>Application of Cellulose Nanocrystals in Oilfield Gravel Packing Fluid</td>
<td>FPInnovations</td>
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<td></td>
<td>Valerie Lafitte, Schlumberger</td>
<td>FPInnovations</td>
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<tr>
<td>8:54</td>
<td>Filtration and Rheological Properties of Wyoming Clay-Water Based Drilling Fluids with Cellulose Nanocrystals (CNC)</td>
<td>FPInnovations</td>
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<td></td>
<td>Hafez Balavi, University of Alberta</td>
<td>FPInnovations</td>
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<tr>
<td>9:16</td>
<td>Cellulose Nanofibres for Sulphate Resistance in Cement Based Systems</td>
<td>FPInnovations</td>
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<td></td>
<td>Vivek Bindiganavile, University of Alberta</td>
<td>FPInnovations</td>
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<tr>
<td>9:38</td>
<td>Microfibrillated Cellulose Outside of the Box</td>
<td>FPInnovations</td>
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<td>Per Svending, FiberLean Technologies Ltd</td>
<td>FPInnovations</td>
</tr>
<tr>
<td>9:38</td>
<td>Effects of Surface Charge Density on the Phase Separation and Rheology of Cellulose Nanocrystal Suspensions</td>
<td>FPInnovations</td>
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<tr>
<td></td>
<td>Tiffany Abitbol, The Hebrew University of Jerusalem</td>
<td>FPInnovations</td>
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</tbody>
</table>

## Tuesday · 6 June 2017

<table>
<thead>
<tr>
<th>Time</th>
<th>Session 2: Industrial Application Testing</th>
<th>Session 3: Self or Directed Assembly of Cellulose Nanocrystals</th>
<th>Session 4: Emulsions</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30-10:00</td>
<td>Application of Cellulose Nanocrystals in Oilfield Gravel Packing Fluid</td>
<td>Tailoring the Chiral Nematic Structure of CNC Iridescent Film Using Surface Charge Hongli Zhu, Northeastern University</td>
<td>Cellulose Nanocrystals with Methylcellulose as a Co-Stabilizer for Pickering Emulsions, Gels, Oil Powders and Aqueous Foams Emily Cranston, McMaster University</td>
</tr>
<tr>
<td>9:38</td>
<td>Microfibrillated Cellulose Outside of the Box</td>
<td>Effects of Surface Charge Density on the Phase Separation and Rheology of Cellulose Nanocrystal Suspensions Tiffany Abitbol, The Hebrew University of Jerusalem</td>
<td>Tailoring Cellulose Nanocrystal Surface Chemistry for Emulsion Polymerization Systems Stephanie Kedzior, McMaster University</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Time</th>
<th>Session 5: Sustainability in Applications</th>
<th>Session 6: Colloidal Interactions in Cellulose Nanomaterials</th>
<th>Session 7: Foams and Aerogels</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00-10:30</td>
<td>Break</td>
<td>酸解 dissociation of surface bound water on cellulose nanofibrils revealed by adsorption of calcium carbonate nanoparticles under the application of ultralow shear. Patrick Gane, Omya International AG.</td>
<td>Novel biobased micro- and nanomaterials in porous foam formed structures. Katarina Torvinen, VTT Technical Research Centre of Finland.</td>
</tr>
<tr>
<td>10:32</td>
<td>Water purification by paper containing silver nanoparticles. Derek Gray, McGill University.</td>
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</tr>
<tr>
<td>11:16</td>
<td>Ultrastrong flexible and conducting laminated bionanocomposites from cellulose nanocrystals. Vladimir Tsukruk, Georgia Institute of Technology.</td>
<td>Colloidal interactions between nanocellulose and nanocarbon materials. Lars Wågberg, KTH Royal Institute of Technology, Fibre and Polymer Technology.</td>
<td>Graft modified CO2-switchable cellulose nanocrystals prepared by living radical polymerization and their use as pickering emulsifier and foaming agents. Joe Glasing, Queen's University.</td>
</tr>
</tbody>
</table>

12:00-2:00  Session 8: Keynote Presentation and Lunch  
Keynote Speaker: Trevor Stuthridge, FPInnovations

2:00-3:30  Session 9: New & Emerging Infrastructure Applications  
Session 10: Fundamentals of Cellulose Nanomaterial-Water Interactions  
Session 11: Mechanisms and Fundamentals


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<tbody>
<tr>
<td>2:46</td>
<td>Cellulose-Clay Synergy Effects in Multifunctional Hybrid Composites for Fire Retardancy Applications Lars Berglund, KTH Royal Institute of Technology</td>
<td>Understanding Cellulose Nanocrystal Interactions and Dispersibility as a Function of Surface Chemistry Michael Reid, McMaster University</td>
<td>Designer Molecules for One-Step Modification of Cellulosic Materials in Aqueous and Organic Media Jose Moran-Mirabal, McMaster University</td>
</tr>
<tr>
<td>3:08</td>
<td>Nanocellulose Membranes for Water Purification: Processing and Scale Up Aji P. Mathew, Stockholm University</td>
<td>Characterization of Confined Water in Chiral Cellulose Nanocrystal Films Jan Obrzut, National Institute of Standards and Technology</td>
<td>Functionalization and Control of Cellulose Nanomaterial Surfaces as Organocatalysts for Acid-Base Catalyzed Reactions Nathan Ellebracht, Georgia Institute of Technology</td>
</tr>
</tbody>
</table>

**3:30-4:00 Break**

**4:00-5:30**

**Session 12: End Users Panel Discussion**

**Moderator:** Hamdy Khalil, The Woodbridge Group

**Panelists Include:**
- Dr. Toivo Kodas, Cabot Corporation
- Dr. Deborah Mielewski, Ford Motor Company
- Dr. Maria Dalko-Csiba, L’Oreal
- Dr. Mohan Panga, Schlumberger

**Session 13: Cellulose Nanomaterial Self-Standing Films**

- Spray Coating – A Rapid Method for Preparation of Free-Standing Nanocellulose Film Swambabu Varanasi, Monash University
- Use of Chromatogeny for the Development of Hydrophobic MFC Films David Guerin, Centre Technique du Papier
- Nanocellulose Based Self-Standing Films for Water Purification and Softening Vanja Kokol, University of Maribor
- Improvement of the Physical and Mechanical Properties of Lignocellulose Nanofibrils (LCNF) Films Through Hybridization Mehdi Tajvidi, Rose-Hulman Institute of Technology

**Session 14: Functional Materials**

- 3D Printing of Textured Cellulose-Based Composites Michael Hausmann, Swiss Federal Laboratories for Materials Science and Technology
- A Novel One Step Method to Prepare Carboxycellulose Nanofibers from Raw Biomass and Their Applications to Remediation for Heavy Metal Ions Benjamin Hsiao, Stony Brook University
- In-Situ Polymerized Cellulose Nanocrystals (CNC) – Poly(L-lactide) (PLLA) Nanomaterials and Applications in Nanocomposite Processing Chuanwei Miao, FPInnovations

**5:30-7:30 Session 15: Poster Session and Student Poster Competition**

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<tr>
<th>Time</th>
<th>Session 16: Cellulose Nanomaterials for the Pulp and Paper Industry</th>
<th>Session 17: Photonics and Catalysts</th>
<th>Session 18: Production of Cellulose Nanomaterials</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30-10:00</td>
<td>An Example of the Creation and Use of MFC (Micro-Fibrillated Cellulose) in Today’s Specialty Papers Market</td>
<td>Cellulose Nanocrystals as Non-Innocent Catalyst Supports and Chiral Inducers</td>
<td>Nanocellulose Derivatives – A Comparative Study Between Wood- and Vegetable-Based Raw Materials</td>
</tr>
<tr>
<td></td>
<td>Ken Schelling, GL&amp;V USA Inc.</td>
<td>Audrey Moores, McGill University</td>
<td>Antti Laukkanen, Betulium</td>
</tr>
<tr>
<td>8:32</td>
<td>Forming a Cellulose Based Nanopaper Using XPM</td>
<td>Lignocellulosic Materials as Copper Frames for the Evaluation of the Copper(I) Catalyzed Azide-Alkyne Cycloaddition (CuAAC) -</td>
<td>Production of Lignin Containing Cellulose Nanomaterials from Wood Chips - A Scale-Up Study</td>
</tr>
<tr>
<td></td>
<td>Zoheb Karim, MoRe Research AB</td>
<td>Gloria Oporto, West Virginia University</td>
<td>J.Y. Zhu, USDA Forest Service, Forest Products Laboratory</td>
</tr>
<tr>
<td>8:54</td>
<td>Scale Up of Nanocellulose/ Hybrid Inorganic Films Using a Pilot Web Forme</td>
<td>Diameter Varying Electro-Spun CNC Composite Nanofiber Study</td>
<td>Production of Cellulose Nanocrystals from Pre-Hydrolyzed Substrates</td>
</tr>
<tr>
<td></td>
<td>Daniele Oliveira de Castro, MoRe Research</td>
<td>Wee-Chih Wang, National Tsinghua University</td>
<td>Eero Kontturi, Aalto University</td>
</tr>
<tr>
<td>9:16</td>
<td>Strengthening and Drying of Board Structures Containing Nanocellulose Materials</td>
<td>Cellulose Nanocrystal Templating of Semiconducting Polymers for Optoelectronic and Photonic Devices</td>
<td>Identifying Glycosyl Hydrolase Enzymes for Production of Cellulose Nanocrystals</td>
</tr>
<tr>
<td></td>
<td>Jani Lehmon, VTT Technical Research Centre of Finland</td>
<td>Bailey Risteen, Georgia Institute of Technology</td>
<td>Valdeir Arantes, University of São Paulo</td>
</tr>
<tr>
<td>10:00-10:30</td>
<td>Break</td>
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<td></td>
<td>Olli ikkala, Aalto University</td>
<td>Sang-Young Lee, Ulsan National Institute of Science and Technology</td>
<td>TriDung (TD) Ngo, InnoTechAlberta</td>
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<td>Valdeir Arantes, University of São Paulo</td>
</tr>
<tr>
<td>11:16</td>
<td>Will Silicones Increase the Value of Lignin and Cellulose?</td>
<td>Functionalized Nanocellulose Integrated Heterolayered Nanomat Separators: From Renewable Resources to</td>
<td>An Overview of CNC Manufacturing Cost, Guidelines for Research Opportunities</td>
</tr>
<tr>
<td></td>
<td>Michael Brook, McMaster University</td>
<td>Sustainable Energy Storages Jung-Hwan Kim, Ulsan National Institute of Science and Technology</td>
<td>Based on Cost and Financial Risks Analysis</td>
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<td></td>
<td>Camilla Abbati de Assis, North Carolina State University</td>
</tr>
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### 11:38
Launderable Conductive Fabrics with Nanocellulose Coating
Yunsang Kim,
University of Georgia
Feasible Application of Hydrophobicity in Amphiphilic ACC-Nanocellulose Created by Aqueous Counter Collision (ACC) Tetsuo Kondo,
Kyushu University

### 12:00-2:00
**Session 22 - Lunch with Presentation by Conference Gold Sponsor CelluForce**

### 2:00-3:30

<table>
<thead>
<tr>
<th>Time</th>
<th>Session 23: Cellulose Nanomaterial Based-Coatings</th>
<th>Session 24: Tissue Engineering and Implants</th>
<th>Session 25: Sols and Gels</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:02</td>
<td>Improved Performance of Water-Based Inks on Plastic Films with Thin Coatings of Cellulose Nanocrystals (CNC) Joseph Aspler, FPInnovations</td>
<td>Injectable Cellulose Nanocrystal Hydrogels as a Platform for Functional Tissue Engineering Applications Kevin De France, McMaster University</td>
<td>Fluorescent, Shear Thinning Hydrogels Formed by Nanocellulose and Graphene Quantum Dots Amir Khabibullin, University of Toronto</td>
</tr>
<tr>
<td>2:24</td>
<td>Strength and Barrier Enhancement of Paperboards Properties with Cellulose Nanofibrils Applied by Blade Coater Doug Bousfield, University of Maine</td>
<td>CNF Hydrogels for Tissue Engineering: Interactions Between Fibroblasts and CNF with Two Different Surface Chemistries Kristin Syverud, Paper and Fibre Research Institute</td>
<td>Surfactant Modified Cellulose Nanofibrils for Enhanced Oil Recovery Trygve D. Jakobsen, Norwegian University of Science and Technology</td>
</tr>
<tr>
<td>2:46</td>
<td>Substrate Requirements for Roll-to-Roll Processed Nanocellulose Coatings Vinay Kumar, Åbo Akademi University</td>
<td>Cross-Linked Cellulose Nanocrystal Aerogels for Bone Scaffolding Applications Daniel A. Osorio, McMaster University</td>
<td>Investigating Cellulose Nanocrystals (CNC) as Oil Well Cement Additive and Its Mechanisms of Action Yaman Boluk, University of Alberta</td>
</tr>
<tr>
<td>3:08</td>
<td>Characteristics of CNF and PVA Suspension Depending on Mixing Ratio Hyeonji Park, Seoul National University</td>
<td>Implantable Nanocomposite Materials Johan Foster, Virginia Tech</td>
<td>Unique Aspects of the Sol-Gel Transition of TEMPO-CN/ Mixed-Linkage Beta-Glucan Bionanocomposites Suvi Arola, University of British Columbia</td>
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</table>

### 3:30-4:00
Break

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### Wednesday · 7 June 2017

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<tr>
<th>4:00-5:30</th>
<th>Session 26: Packaging</th>
<th>Session 27: Wound Dressings and Drug Delivery</th>
<th>Session 28: Filaments and Threads</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:02</td>
<td>Developing Polypropylene/Polysaccharide Nanocrystal Laminated Film for Flexible Barrier Packaging&lt;br&gt; Jinwu Wang, Forest Products Laboratory</td>
<td>Bioactive Functionalization of Plant-Derived Nanocellulose for Advanced Therapeutic Applications&lt;br&gt; Ramon Weishaupt, Swiss Federal Laboratories for Materials Science and Technology</td>
<td>Spinning a Yarn: Cellulose Fibres Spun from Solution&lt;br&gt; Stephen Eichhorn, University of Exeter</td>
</tr>
<tr>
<td>4:24</td>
<td>Novel In-Situ Precipitation Concept to Prepare Green Barrier Materials&lt;br&gt; Swambu Varanasi, Monash University</td>
<td>Cellulose-Based Biosensors for Enzyme Detection&lt;br&gt; Harry Brumer, University of British Columbia</td>
<td>Filaments of Cellulose Nanofibrils via Hydrogel Spinning&lt;br&gt; Meri Lundahl, Aalto University</td>
</tr>
<tr>
<td>4:46</td>
<td>Nanocellulose Films with Improved Mechanical and Gas Barrier Properties&lt;br&gt; Christian Aulin, Innventia</td>
<td>Cellulose Nanofibrils Chemical Surface Modification for Monitoring Drug Release in Tissue Engineering&lt;br&gt; Julien Bras, University Grenoble Alpes - LGP2/Grenoble INP</td>
<td>Fabrication of a Continuous Textile-Like Fibre Yarn from Cellulose Filaments&lt;br&gt; Annie Dorris, FPInnovations</td>
</tr>
<tr>
<td>5:08</td>
<td>Measuring the Oil and Grease Barrier Properties of Microfibrillated Cellulose Coated Paper Using Ultrasonic Signal Variation&lt;br&gt; Joerg Padberg, Munich University of Applied Sciences</td>
<td>Poly(amidoamine) Dendrimers as a Platform to Obtain Complex and Multifunctional Magnetic Nanoparticle Based Structures&lt;br&gt; Adriano Boni, Università de Fribourg</td>
<td>Anisotropy Determination During Assembly of Nanocellulose Fibris into a Gel Thread&lt;br&gt; Karl Håkansson, Innventia</td>
</tr>
<tr>
<td>6:30-10:00</td>
<td>Conference Dinner</td>
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</tr>
</tbody>
</table>

### Thursday · 8 June 2017

<table>
<thead>
<tr>
<th>8:30-10:00</th>
<th>Session 29: New Metrology Methods for Cellulose Nanomaterials</th>
<th>Session 30: Updates from Producers</th>
<th>Session 31: Infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:54</td>
<td>Xyloglucan Adsorption as a Method to Measure Surface Area for Never Dried Cellulose Nanofibers&lt;br&gt; Carl Moser, KTH Royal Institute of Technology</td>
<td>New Transition Metal Catalyzed Oxidative CNC Production Method&lt;br&gt; Sean McAlpine, Blue Goose Biorefineries</td>
<td>Cellulose Filaments Reinforcement of Wood Fibre Insulation Boards&lt;br&gt; Yaolin Zhang, FPInnovations</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Time</th>
<th>Session 32: Intrinsic Properties Measurement (CNCs)</th>
<th>Session 33: Workplace Safety: From Research to Practice</th>
<th>Session 34: Composites - Solvent Based Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:16</td>
<td>Fluorescence Methods to Probe CNC Distribution in Polymer Composites Linda Johnston, National Research Council Canada</td>
<td>Mineral/ Microfibrillated Cellulose Composite Materials: Next Generation Products, New Applications and Product Forms David Skuse, Fiberlean Technologies</td>
<td>High Performance Cement via Cellulose Nanocrystal Addition Jeffrey P Youngblood, Purdue University</td>
</tr>
<tr>
<td>09:38</td>
<td>Interactions and Layer Properties of Nanocellulose Using Multiparametric Surface Plasmon Resonance Spectroscopy Annika Jokinen, BioNavis</td>
<td>Europe’s First Pilot Facility for Cellulose Nanocrystals (CNC) Emma Johansson, Processum</td>
<td>Cementitious Material Reinforced with Thermomechanical Pulp (TMP) and Nanofibrillated Cellulose (NFC) Tomo Kakitani, Sumitomo Forestry Co.</td>
</tr>
<tr>
<td>10:00-10:30</td>
<td>Break</td>
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<tr>
<td>10:30-12:00</td>
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<tr>
<td>10:32</td>
<td>Crystallinity of Cellulose Nanocrystals by Raman, NMR, and XRD Methods Umesh Agarwal, USDA FS, Forest Products Laboratory</td>
<td>Occupational Health and Safety Characterization of Several North American Cellulose Nanocrystals Brian O’Connor, FPInnovations</td>
<td>Biodegradable Thermoplastic Starch (TPS) Nanocomposite with Cellulose Nanofibers from Oil Palm Empty Fruit Bunches (OPEFBs) as Reinforcement Agent Farah Fahma, Bogor Agricultural University</td>
</tr>
<tr>
<td>10:54</td>
<td>Analyzing Process Parameter Interaction on Acid Hydrolysis Production of Cellulose Nanocrystals Michael Bortner, Virginia Tech</td>
<td>Global Activities of Cellulose Nanomaterial Environmental Health and Safety - Opportunities for Collaboration Kimberly Ong, Vireo Advisors</td>
<td>Cellulose Nanocrystal/Polymer Nanocomposites for Adhesive Applications Alexandra Ouzas, University of Ottawa</td>
</tr>
<tr>
<td>11:38</td>
<td>Beyond Buckling: Humidity Independent Measurement of the Mechanical Properties of Cellulose Nanocrystal Films Urooj Gill, McMaster University</td>
<td>Establishing the Safety of Cellulose Nanomaterials for Food Related Uses Jo Anne Shatkin, Vireo Advisors</td>
<td>Morphology and Mechanical Properties Electrospun Polystyrene Fibers Containing Cellulose Nanocrystals (CNC) Modified with Various Functional Groups Mahsa Kalantari, University of Alberta</td>
</tr>
<tr>
<td>12:00-2:00</td>
<td>Session 35: Keynote Presentation and Lunch</td>
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<td></td>
<td>Keynote Speaker: John Kozij, Canadian Forest Service</td>
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<table>
<thead>
<tr>
<th>2:00-3:30</th>
<th><strong>Session 36:</strong> Quantitative Property Control for Cellulose Nanofibril Production</th>
<th><strong>Session 37:</strong> Cellulose Nanomaterial Product Development</th>
<th><strong>Session 38:</strong> Composites - Melt &amp; Dry Processing</th>
<th><strong>Session 39:</strong> Student Session: Career Roundtable</th>
</tr>
</thead>
</table>
| 2:02              | Understanding Longitudinal Wood Fiber Ultra-Structure for the Production of Cellulose Nanofibrils Using Disk Milling with Dilute Acid Prehydrolysis  
JY Zhu, USDA Forest Service, Forest Products Laboratory | The Nanocellulose Platform Economy - An Emerging Disruptor  
Jesse Kautto, Pöyry Management Consulting Oy  

Lu Wang, University of Maine | Cellulose Nanofibrils Reinforced Polypropylene Filaments for Fused Filament Fabrication: Crystallization Consideration  
Makoto Arai, Nippon Paper Industries Co., Ltd. | Hosted by the Nano Student Committee  
Wim Thielemans, KU Leuven |  
Jeffrey Youngblood, Purdue University  
Orlando Rojas, Aalto University  
Johan Foster, Virginia Tech |
| 2:24              | What is the Difference Between Different Cellulose Nanofibrils? The Quality Index  
Johanna Desmaisons, LGP2 | Challenges for the Commercialization of Cellulose Nanofibers (CNFs)  
Makoto Arai, Nippon Paper Industries Co., Ltd. | Reactive Extrusion of Hydrophobic Polymer with Nanocellulose Filler for Improved Mechanical Properties  
Kevin Holder, Essentium Materials University of Maine |  
Sean Ireland, FibreLean  
Kim Nelson, American Process  
Shaul Lapidot, Melodea  
Linda Johnston, National Research Council of Canada |
| 2:46              | Optimization of the Reaction Conditions of TEMPO-Mediated Oxidation and the Fibrillation Process for the Production of Nanofibrillated Cellulose from Rice Hulls  
Guido de Titto, National Institute of Industrial Technology | Nanocellulose Commercialization: An End User Perspective  
Jack Miller, Market-Intell LLC | Processing Strategies for Incorporating Cellulose Nanocrystals in a Commercially Available Semicrystalline Thermoplastic  
Matthew Orr, Georgia Institute of Technology |  
Sean Ireland, FibreLean  
Kim Nelson, American Process  
Shaul Lapidot, Melodea  
Linda Johnston, National Research Council of Canada |
| 3:08              | Fluorogenically Modified Cellulose Nanofibrils  
Jeremiah Woodcock, NIST | Risk Assessment of Polymer Composites Containing Cellulose Nanofibrils (CNF)  
Considerations of Industrial Production  
Heli Kangas, VTT Technical Research Centre of Finland Ltd. | Development of the Continuous Production Process "Kyoto Process" of CNF Reinforced Plastics  
Hirohito Yamano, Kyoto University |  
Jeffrey Gilman, NIST |
| 3:30-4:00         | Break |  |  |  |
### Thursday • 8 June 2017

<table>
<thead>
<tr>
<th>4:00-5:30</th>
<th>Session 40: Production and Characterization of Cellulose Nanomaterials</th>
<th>Session 41: Standards and International/Commercial Measurement Needs</th>
<th>Session 42: Composites - Reactive Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:24</td>
<td></td>
<td>Survey of Measurement Methods for CNCs Jeffrey W. Gilman, NIST</td>
<td>Epoxies Can Solve Moisture Problems in Nanocellulose Materials Farhan Ansari, KTH Royal Institute of Technology</td>
</tr>
<tr>
<td>4:46</td>
<td>Extraction and Characterization of Nanocellulose from Several Agro-Industrial Residues Guillermo Jimenez, Laboratory of Polymers (POLIUNA)</td>
<td>On the Importance of Size Characterisation of Commercial Grades of Microfibrillated Cellulose Per A. Larsson, KTH Royal Institute of Technology</td>
<td>Synthesis and Characterization of CO2-Responsive Cellulose Nanocrystals via Living Radical Polymerization Omar Garcia-Valdez, Queen’s University</td>
</tr>
<tr>
<td>5:08</td>
<td>Cellulose Nanofibril (CNF) Metrology Mahyar Mazloumi, National Research Council of Canada</td>
<td>Development of an Online Analyzer for Characterizing Cellulose Filaments Natalie Pagé, FPInnovations</td>
<td>Effect of Nanocellulose Type and Surface Functionalization on Nanocellulose Coated Glass Fiber Reinforced Polyester Composite Joyanta Goswami, Georgia Institute of Technology</td>
</tr>
</tbody>
</table>

### Friday • 9 June 2017

<table>
<thead>
<tr>
<th>9:00-12:00</th>
<th>Producers Committee Meeting (Members Only)</th>
</tr>
</thead>
</table>

**Nano 2017 Conference Co-chairs**
Emily Cranston, McMaster University  
Derek Gray, McGill University  
Tom Lindstrom, Innventia  
Jean Bouchard, FPInnovations

**2017 Conference Program Chair**
Joel Kelly, BC Research Inc.
Registration Information

Register online at conference.tappinan.org or by contacting TAPPI’s Member Connection Center at 1.800.332.8686 (US), 1.800.446.9431 (Canada) or +1.770.446.1400 (Worldwide) +1.770.446.6947 (Fax)

Registration Fees *(All fees must be paid in US Dollars.)*

<table>
<thead>
<tr>
<th>FULL CONFERENCE**</th>
<th>On or before 10 May 2017</th>
<th>10 May to 1 June 2017</th>
<th>Onsite</th>
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<tbody>
<tr>
<td>Member *</td>
<td>$995</td>
<td>$1,145</td>
<td>$1,237</td>
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<tr>
<td>Nonmember</td>
<td>$1,270</td>
<td>$1,475</td>
<td>$1,714</td>
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<tr>
<td>Speaker - Full Conference Member *</td>
<td>$715</td>
<td>$785</td>
<td>$897</td>
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<tr>
<td>Speaker - Full Conference Nonmember</td>
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<td>$959</td>
<td>$1029</td>
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<tr>
<td>Group Discount - Member * (price per person for 3+ from same company)</td>
<td>$870</td>
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<tr>
<td>Group Discount - Non-member (price per person for 3+ from same company)</td>
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<tr>
<td>Retired Member *</td>
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<tr>
<td>Student Member</td>
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<td>$285</td>
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<tr>
<td>Student Nonmember</td>
<td>$320</td>
<td>$325</td>
<td>$365</td>
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| SINGLE DAY**      |                          |                      |        |
| Single Day - Member* | $495                   | $565                 | $635   |
| Single Day - Nonmember | $650               | $740                 | $838   |

**Special Events (optional)**

- Conference Dinner (not included in registration) | $100 | $100 | $100
- Tour | $25 | $25 | $25
- EHS Workshop
  - Member * | $160 | $160 | $160
  - Nonmember | $220 | $220 | $220

*Member discounts are available to members of TAPPI in good standing.
**Conference Dinner ticket not included with conference registration. Must purchase a separate ticket to attend.

Cancellation and Refunds

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 10 May, 2017. Please note: There will be a 50% refund for all written cancellations made after 10 May, 2017 but no later than 5 business days prior to the start of the conference, 31 May, 2017. Understandably, after this time, no refunds can be issued. Substitutions, however, will be accepted any time without a penalty.

Refund:

- **100%**: Cancellation received by 10 May, 2017.
- **50%**: Cancellations received after 10 May, 2017 and no later than 31 May, 2017.
- **NO REFUND**: Cancellations received after 31 May, 2017.

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All registered attendees can download a free Nano Conference app that has it all. You’ll have access to the conference schedule, speaker information, floor plans, and exhibitor details, as well as tools to connect with other participants.
Hotel Information

Hyatt Regency Montreal
http://conference.tappinano.org/hotel-and-travel/
1255, Jeanne - Mance Street CP. 130, Montreal, QC H5B 1E5 Canada
phone: + 514.982.1234, fax: + 514.841.2036

A block of discounted rooms have been reserved for conference participants and guests. Cut-off date for discounted rates is 10 May 2017. Rates for Nano participants are $229* single/double occupancy. Rates are in Canadian Dollar.

*Nightly rate listed does not include tax or incidentals.

Please note: TAPPI has negotiated complimentary internet service in all guest rooms for all attendees booked under the conference rate over the event dates of 3 - 8 June, 2017. Be sure to mention that you’re attending Nano 2017 when you reserve your room!

Conference Bookstore
http://conference.tappinano.org/attend/bookstore/

Nano 2017 Special Publications
These special publications from TAPPI are available to attendees, most a “conference only” discount. You can purchase these books when registering and pick them up when you arrive at the conference. Rates are in US Dollars.

Production and Application of Cellulose Nanomaterials
Order code: 0101R322
Special Conference Price: $149

Nano Science and Nano Materials: Synthesis, Manufacturing and Industry Impacts
Order code: 12NSNM
Special Conference Price: $120

Nanotechnology Health and Environmental Risks, Second Edition
Order code: 3NANOENV
Special Conference Price: $120

Nanocellulose: From Nature to High Performance Tailored Materials
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Special Conference Price: $180

Nanotechnology: Understanding Small Systems
Order code: 11NANOSMALL
Special Conference Price: $80

Polymer Nanocomposite Handbook
Order code: 11POLYNANO
Special Conference Price: $115

Nanotechnology for the Forest Product Industry Vision and Technology Road Map
Order code: 0101R314
Special Conference Price: $60

Fundamentals of Fiber Science
Order code: 15FUNDFIBER
Special Conference Price: $149

Introduction to Nanocomposite Materials
Order code: 16INTNANO
Special Conference Price: $89

Order code: 0202SMOOK4
Special Conference Price: $75

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TAPPI’s International Nanotechnology Division
www.tappinano.org

TAPPI’s International Nanotechnology Division is a forum for scientists, technical professionals, students and other stakeholders interested in advancing the responsible and sustainable production and use of renewable nanomaterials. Launched in 2011, as a new division within TAPPI after several years as a large committee, the Nano Division is active and busy! Together, members plan this annual conference; develop books and webinars to provide information, both general and detailed, to audiences all around the world; promote the use of renewable nanomaterials; provide a forum for researchers and scientists to gather and share information and needs; and engage today’s students to become tomorrow’s leaders.

Join the Nano Division!
To belong to the NanoDivision, all you need to do is join TAPPI. Once you are a TAPPI member, you can join committees and get access to member-only information. Visit the Division web page (tappinano.org) for details on the benefits of joining TAPPI and how to join the Division.