As of 28 February, 2013
Technical Program
Subject to Change.

Monday, 24 June 2013 - Stockholm, Sweden

18:00 – 18:30  Sing-Sing, Lindstedtsvägen 30, KTH Campus

Session a:  Speaker/Session Chair Meeting Reception

18:30 – 19:30  Sing-Sing, Lindstedtsvägen 30, KTH Campus

Session b:  Welcome Reception

Tuesday, 25 June 2013
F1/F2 Conference Rooms, Lindstedtsvägen 22, KTH Campus, Stockholm, Sweden

8:00 – 8:45

Session 1:  Welcome & Keynote Presentation

• Welcome & Introductions: Conference Chairs
• Keynote Speaker: David Lazarevic, Division of Environmental Strategies Research and the Division of Industrial Ecology, KTH
Session Chair: Bruce Lyne, Royal Institute of Technology

9:00 – 10:30  F1

Session 2:  CN Processing

Session Chair: Alan Rudie, US Forest Products Laboratory

• High CNC Yield with Zero Cellulose Loss: Recovering Cellulosic Solid Residue (CSR) from CNC Production Waste Stream to Produce Strong and Optically Transparent Film, Junyong Zhu, US Forest Products Laboratory
• Energy Efficient Manufacture of Microfibrillated Cellulose by Attachment of Carboxymethyl Cellulose, Mikael Ankerfors, Innventia AB
• Correlations Between Pulp Composition and Efficiency of M/NFC Production, Michel Petit-

9:00 – 10:30  F2

Session 3:  Self and Directed Assembly of Nanocellulose

Session Chair: Eero Konturri, Aalto University

• Tailoring of Supramolecular Interactions in Nanocellulose Systems for New Functions, Olli Ikkala, Aalto University
• Nanoparticles and Nanostructures from Direct- and Self- Assembly of Components Cleaved from Fiber Cell Walls, Orlando Rojas, North Carolina State & Aalto University
• Pattern Production in Iridescent Cellulose Nanocrystal Films, Stephanie Beck, FPInnovations
2013 TAPPI INTERNATIONAL CONFERENCE ON
Nanotechnology for Renewable Materials
24-27 June 2013
KTH Royal Institute of Technology • Stockholm, Sweden

Conil, FCBA
- Water Redispersable Dried Nanofibrillated Cellulose, Julien Bras, Grenoble INP Pagora - LGP2 (FSCN)
- 2-Dimensional Nanoscale Structures from Cellulosic Materials, Eero Kontturi, Aalto University

10:30 – 11:00 BREAK

Session 4: CNC Composite Processing
Session Chair: Hamdy Kahlil, Woodbridge Group
- Fabrication of Polyolefin / Nanocrystalline Cellulose Composites by Conventional Extrusion and by Water-Assisted Extrusion, Karen Stoeffler, National Research Council Canada
- Synthesis and Characterization of NCC-Reinforced Polyacrylamide Nanocomposite Hydrogels, Wadood Hamad, CelluForce
- Super-Strong Soy Protein/Nanocellulose Composite Aerogels, Julio Arboleda, North Carolina State University
- Nano Crystalline Cellulose Composite Foams From Renewable Resources, Shaul Lapidot, Melodea Ltd

Session 5: Surface Modification and Responsive Materials
Session Chair: Ted Wegner, US Forest Products Laboratory
- Surface Assembly of Chemically Reactive Polysaccharides on Nanocellulose, Janne Laine, Aalto University
- Surface Modified Cellulose Nanocrystals for Use as in Durable Good Applications, Dylan Boday, IBM Materials Engineering
- Responsive Cellulose Nanocrystals: A One-Step, Water-Based Polymerization Method, Emily Cranston, McMaster University
- Towards a Green Chemistry for Surface Functionalization of Cellulose Nanocrystals: the Case of Aroma Grafting Compounds, Etzael Espino Perez, Grenoble INP Pagora-PGP2 (FSCN)

12:45 – 13:45 Lunch in Student Union (kårhuset)

Session 6: Keynote Presentation
Keynote Speaker: Arthur Carty, Executive Director & Research Professor in the Department of Chemistry, Waterloo Institute for Nanotechnology, Univ. of Waterloo, and Special Advisor to the President on Intl. Science and Technology Collaboration, “Small World, Large Impact: Driving a Materials Revolution through Nanotechnology”

Session Chair: Robert Moon, US Forest Products Laboratory

Session 7: CNF Composite Processing
Session Chair: Alain Dufresne, Grenoble Institute of Technology
- Membranes from Renewable Resources for Water-Purification, Andreas Mautner, Imperial

Session 8: Nanocellulose-Organic/Inorganic Hybrids
Session Chair: Marie-Pierre Laborie, University of Freiburg
- Hydrogelation of Carboxylated Cellulose
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<td>• Hydrophobic Nanofibrillated Cellulose-Based Nanopaper Through a Mild Chemical Functionalization Approach, <strong>Houssine Sehaqui</strong>, EMPA</td>
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<td>• Magnetic Cellulose Nanocrystal Hybrid, <strong>Tiina Nypelä</strong>, North Carolina State University</td>
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<td>• ZnO-Bacterial Cellulose Nanocrystal Composite and its Potential as Energy Harvesting Material, <strong>Levente Csoka</strong>, University of West Hungary</td>
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<td>• Atomic Layer Deposition on Cellulose Nanocrystal Aerogels, <strong>John Simonsen</strong>, Oregon State University</td>
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15:30 – 16:00 BREAK

16:00 – 17:30 **F1**

**Session 9: CN Composite Interfaces**

**Session Chair:** Wadood Hamad, CelluForce

• Interface/Interphase Measurements of Cellulose Nanofiber-Based Nanocomposites, **Jeffrey Gilman**, NIST

• Structure Properties and Interface in Polystyrene Nanocomposites Based on Cellulose Nanocrystals with Physical and Chemical Modifications from Non-Covalent and Covalent PEG Compatibilization, **Ning Lin**, Grenoble Institute of Technology (Grenoble INP)-Pagora

• Development of Pigmented Composites on the Basis of Nano- and Micro-Fibrillated Cellulose, **Michel Schenker**, Omya Development AG

• Utilising the Potential of Bacterial Cellulose in Composite Materials, **Alexander Bismarck**, Imperial College London

16:00 – 17:30 **F2**

**Session 10: Assembly in Suspension and Rheology**

**Session Chair:** Yaman Boluk, University of Alberta

• The Rheological Properties Nanofibrillated Cellulose at Moderate Solids, **Douglas Bousfield**, University of Maine

• Nanofibrillar Cellulose - The link Between Rheology and Stabilising Effect, **Antti Laukkanen**, UPM Corporation, **Martina Lille** and **Pirkko Forssell**, VTT Technical Research Centre of Finland

• Rheological Properties of Suspensions of Nanocrystalline Cellulose in Polymer Solutions, **Liyan Zhao**, Alberta Innovates Technology Futures

• Hybrid Polymer-Nanocrystalline Cellulose (NCC) Suspensions as Smart Materials - **Yaman Boluk**, University of Alberta

17:30 – 19:30 Sing-Sing, Lindstedtsvägen 30, KTH Campus

**Session 11:** Conference Reception, Poster Session and Exhibitor Displays

Session chair: **Martti Toivakka**, Abo Akademi University

*Over 50 posters will be presented at the Conference.*

*Please see full listing below (last page)*
**Wednesday, 26 June 2013**

F1/F2 Conference Rooms, Lindstedtsvägen 22, KTH Campus, Stockholm, Sweden

8:00 – 8:45 **F1**

**Session 12:** Keynote Presentation  

**Session Chair:** **Ulla Forsstrom**, VTT Technical Research Centre of Finland

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| 9:00 – 10:30  | F1   | **Session 13:** CNF | **Jouni Paltakari**, Aalto University | • Flow Modifications with Nanofibrillated Cellulose Suspensions, **Paul Krochak**, Innventia AB  
• Processability of Nanocelluloses, **Ari Jäsb erg**, VTT Technical Research Centre of Finland  
• Potential of Micro Fibrillar Cellulose in Water-Laid and Foam-Laid Papers, **Jani Lehmonen**, VTT Technical Research Centre of Finland  
• Structural Change in Nanofibrillated Cellulose Mat by Grinding, Dewatering, and Drying Conditions, **Kyujeong Sim**, Seoul National University |  |
| 9:00 – 10:30  | F2   | **Session 14:** CN Composites | **Johan Foster**, University of Fribourg | • Thermal Behavior of Cellulose Nanocrystal Films, **Jeffrey Youngblood**, Purdue University  
• Effect of Temperature and Humidity on Mechanical Properties of Cellulose Nano-Crystals Films, **Siqun Wang**, University of Tennessee  
• Thermo-Sensitive Ultrathin Nanocomposite Films Manufactured with Cellulose Nanowhiskers and Maleic Anhydride Plasma Polymerization, **Michel Brioude**, University of Freiburg  
• Biomimetic Nanocomposites Through Self-Assembly of Nanofibrillated Cellulose and Water-Soluble Polysaccharides, **Monika Österberg**, Aalto University |  |
| 10:30 – 11:00 |      | BREAK     |                    |                                             |                                                                      |
| 11:00 – 12:30 | F1   | **Session 15:** CNF | **Sean Ireland**, Verso Paper Corp. | • MFC Labelling, Retention and Distribution in Paper, **Juha Salmela**, VTT Technical Research Centre of Finland |  |
| 11:00 – 12:30 | F2   | **Session 16:** CNF Barrier | **Julien Bras**, Grenoble INP Pagora - LGP2 (FSCN) | • Use of cellulose Microfibrils in the Development |  |
Centre of Finland
- The Effects of Nanocelluloses on Flocculation and Retention of Papermaking Fillers, Markus Korhonen, Aalto University
- Pre-Flocculation of GCC and Clay onto Nano-/Microfibrillated Cellulose as Compound to Improve the Strength Properties of Highly Filled Graphical Papers, Tiemo Arndt, Papiertechnische Stiftung (Heidenau)
- Binding Fillers for Paper Applications Using Nanoscale Calcium Silicate Hydrate Coating and Nanofibrillated Cellulose, Katriina Torvinen, VTT Technical Research Centre of Finland

12:45 – 13:45 Lunch in Student Union (kårhuset)

Session 17: Keynote Presentation
Keynote Speaker: Martha Marrapese, Keller and Heckman, USA
Session Chair: World Nieh, US Forest Service

14:00 – 15:30 F1

Session 18: Packaging
Session Chair: Tamal Ghosh, Pepsico Advanced Research
- Nanofibrillated Cellulose/Layered Silicates Composite Films for Barrier Applications, Tanja Zimmermann, EMPA
- Hybrid Antimicrobial Copper-Cellulose Based Nanocomposite Embedded in Thermoplastic Resins for Active Food Packaging, Gloria Oporto, West Virginia University
- Fungal Chitin – Promising Renewable Nanomaterial for Future, Wan Mohd Fazli Wan Nawawi, Polymer and Composite Group, Imperial College London
- Improving THE Barrier Properties of Poly(Lactic Acid) Bottle by APPLYing LbL-technique, Katalin Halasz, University of West Hungary

14:00 – 15:30 F2

Session 19: Safety 1
Session Chair: JoAnne Shatkin, CLF Ventures
- Environmental Health and Safety Studies Associated with the Demonstration Scale Production of NanoCrystalline Cellulose (NCCTM) at the CelluForce plant in Windsor, Quebec, Brian O’Connor, FPInnovations
- Amount, Characteristics and Toxicity of Nano-Scale Cellulose Fibrils, Heli Kangas, VTT Technical Research Centre of Finland
- Verifying the Biocompatibility of Cellulose Nanofibril Structures as a First Step to Develop Filters for Air-Borne Nano-Particles, Kristin Syverud, Paper and Fibre Research Institute
- Biodistribution of Poly (Lactic-Co-Glycolic) Acid (PLGA) and PLGA/Chitosan Nanoparticles in F344 Rats Orally Exposed to Nanoparticles for Seven Days, Cristina Sabliov, Louisiana State Univ. and LSU AgCenter

15:30 – 16:00 BREAK

16:00 – 17:30 F1

Session 20: CN Modeling

16:00 – 17:30 F2

Session 21: Safety 2
Session Co-Chairs: Stan Stoyanov and Andriy Kovalenko, National Institute of Nanotechnology

- Molecular Mechanisms of the Axial Stiffness of Cellulose Nanocrystals, Malin Wohlert, Wallenberg Wood Science Center
- Multiscale Modeling for Rational Design of Nanocrystalline Cellulose Based Nanocomposites, Foams, Drug Carriers, and Security Inks, Andriy Kovalenko, National Institute for Nanotechnology
- Micro-Rheology of Nanocellulose Suspensions with Smoothed Particle Hydrodynamics Simulation, Jukka Ketoja, VTT Technical Research Centre of Finland

Session Chair: Brian O’Connor, FPInnovations

- Consumer, Health and Safety perspectives: Recent results related to nanofibrillar cellulose, Juulia Rouhiainen, Poyry Management Consulting Oy
- Sustainability Assessment of Nanocellulose and Its Applications: A Critical Review and a Proposal of an Integrated Methodology, Marco Cinelli, University of Warwick
- Incorporating Life Cycle Thinking into Risk Assessment for Nanoscale Materials: Case Study of Nanocellulose, Jo Anne Shatkin, CLF Ventures Inc

18:30 – 22:00
Session 22: Conference Dinner at the Vasa Museum

Thursday, 27 June 2013
F1/F2 Conference Rooms, Lindstedtsvägen 22, KTH Campus, Stockholm, Sweden

8:00 – 8:45 F1
Session 23: Keynote Presentation
Keynote Speaker: Tom van Teunenbroek, Ministry of Infrastructure and Environment (Netherlands), “Nanosafety Research and Legislation in European Union.: Future Activities”
Session Chair: Juulia Rouhiainen, Poyry Management Consulting Oy

9:00 – 10:30 F1
Session 24: Nanotech Coatings 1
Session Chair: Pia Qvintas, VTT
- Functional Thin Coatings for Paper by Foam Coating, Karita Kinnunen, VTT Tech University of Centre Finland
- Roll-to-Roll Atomic Layer Deposition for Flexible Substrates, Kimmo Lahtinen, Lappeenranta Univ. of Technology
- The Properties of Paper Coating Layers That

9:00 – 10:30 F2
Session 25: Novel Medical Applications
Session Chair: Orlando Rojas, North Caroline State University & Aalto University
- Surface Functionalized Nanofibrillar Cellulose (NFC) Film as a Platform for Immunoassays and Diagnostics, Ilari Filpponen, Aalto University
- Nanoemulsion Based-Biopolymers for Oral Delivery of Insulin, Barbara Abraham-Vieira, Faculty of Pharmacy of University of Coimbra
- Cellulose Nanoparticle Based Ester Prodrugs for
Contain Nanofibrillated Cellulose, **Douglas Bousfield, University of Maine**

- Meeting the Challenge of Replacing High Cost White Top Liner: Designing the High Bright Nanotechnology Solution, **Catherine Ridgway, Omya Development AG**

Potential Colon-specific Drug Delivery: Synthesis, Physicochemical Characterization and Drug Release Studies, **Yuvraj Negi, IIT Roorkee**

- Nanofibrillated Cellulose as Carrier for Short Peptides Assemblies for Human IgG Detection and Affinity Separation, **Yanxia Zhang, North Carolina State University**

10:30 – 11:00 BREAK

11:00 – 12:30 F1

**Session 26**: Nanotech Coatings 2

Session Chair: **Doug Bousfield**, University of Maine

- Multifunctional Nanoparticle Coatings on Cellulose Based Substrates Using Liquid Flame Spray (LFS) Technique, **Mikko Tuominen, Tampere University of Technology**

- Wear Resistance of LFS-Nanoparticle Coated Paper, **Milena Stepien, Abo Akademi University**

- Cellulose Nanofibers: A Suitable Additive to Improve the Performance of Wood Coatings? **Stefan Veigel, University of Natural Resources and Life Sciences**

- Nanofibrillated Cellulose as an Additive in Coating Applications, **Saila Jämsä, VTT Technical Research Centre of Finland**

11:00 – 12:30 F2

**Session 27**: Standards Characterization

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

- Viscosity Measurement – A Valuable Tool for Routine Quality Control of Fibril Cellulose, **Asko Sneck, VTT Technical Research Centre of Finland**

- Fractional Analysis and Characterization of Microfibrillated Cellulose, **Ossi Laitinen, University of Oulu**

- Surface Ionic Charge on Cellulose Nanocrystals, **Derek Gray, McGill University, Department of Chemistry**

- Surface Modification of Cellulose Nanowhiskers, **Wim Thielemans, University of Nottingham**

12:45 – 13:45 Lunch On Own

14:00 – 16:00 F2

**Session 29**: Standardization Workshop

Session Chair: **World Nieh**, US Forest Service

16:00 – ADJOURN

16:00 – 17:00 Post-Meeting Steering Committee Meeting

- Review/Critique of 2013 Conference and Planning for 2014–Steering Committee

**Thank you to the volunteers for all of your hard work in putting the conference technical program together. We look forward to seeing you at the 2013 TAPPI Nanotechnology Conference!**
**Conference Co-Chairs:**
Ulla Forsström, VTT Technical Research Centre of Finland
Bruce Lyne, Royal Institute of Technology
Phil Jones, IMERYS

**Theme Leaders:**
Jouko Niinimäki, University of Oulu
Lars Wagberg, KTH
Jouni Paltakari, Helsinki Univ. of Technology
Paul Gatenholm, Chalmers University of Goteborg
Jouko Peltonen, Abo Akademi University
Martti Toivakka, Abo Akademi University
Juulia Rouhiainen, Poyry Management Consulting Oy
World Nieh, USDA Forest Service
Robert Moon, USDA Forest Service
Orlando Rojas, North Carolina State & Aalto University

**POSTERS**

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<td>Nanoemulsion Based-Biopolymers for Oral Delivery of Insulin</td>
<td><strong>Barbara Azevedo Abrahim-Vieira, Faculty of Pharmacy of University of Coimbra</strong></td>
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Rheology of Coating Suspensions and Possibilities for Predicting the Final Dry Structure of Coated Layers - Yana Petkova, Karlstad University

Processing of Nanocomposites Containing Cellulose Nanocrystals - Johan Foster, University of Fribourg

Role of Ligno-Hemicellulosic Matrix Composition in Plant Biomass Recalcitrance: Investigation by the 3D-RISM-KH Molecular Theory of Solvation - Stanislav Stoyanov, National Institute for Nanotechnology

Characteristics of Cellulose Nanocrystals and Their Reinforcement of Polyvinyl Alcohol-Based Nanocomposites - Byung-Dae Park, Kyungpook National University