2013 TAPPI INTERNATIONAL CONFERENCE

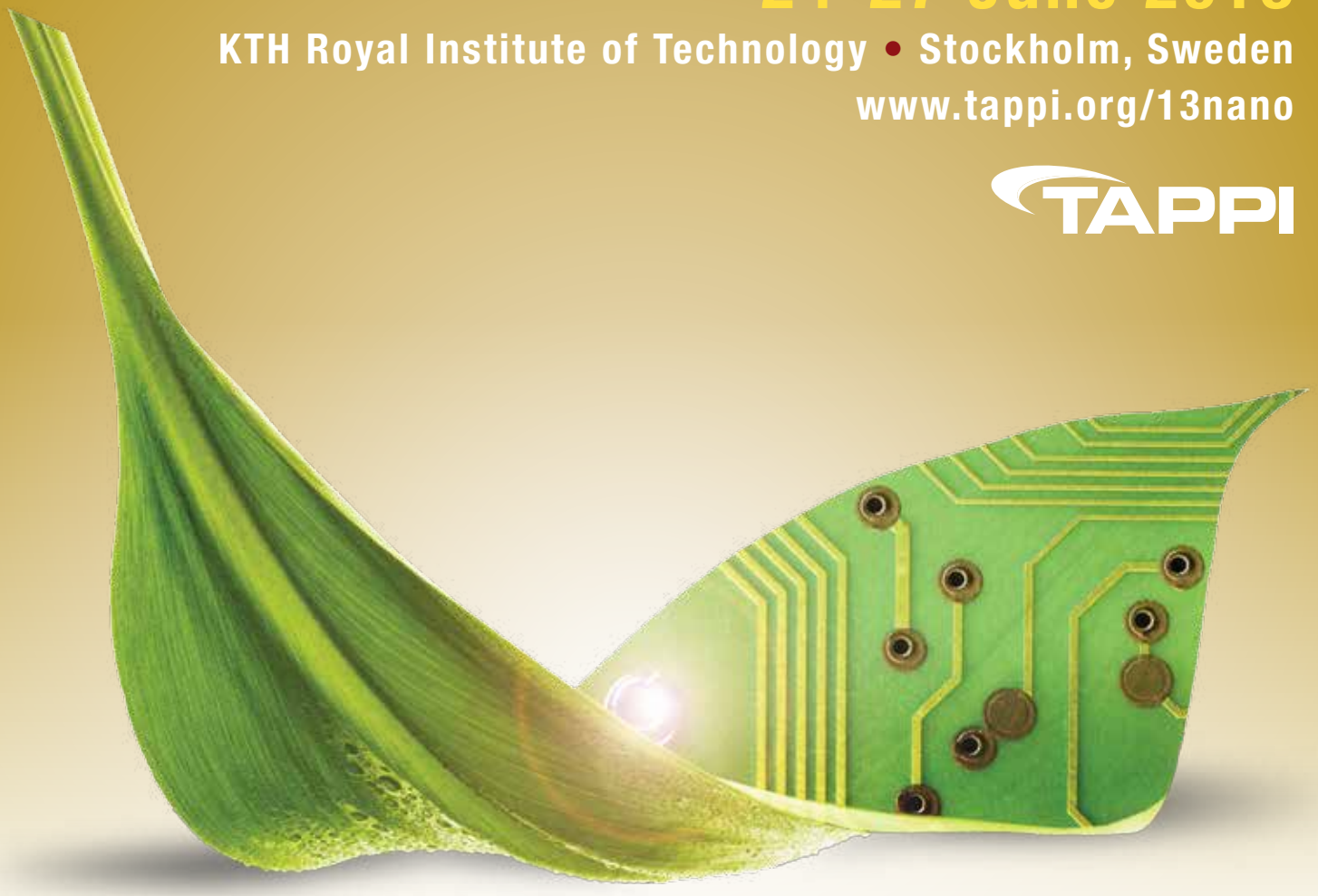
On Nanotechnology for Renewable Materials

24-27 June 2013

KTH Royal Institute of Technology • Stockholm, Sweden

www.tappi.org/13nano

TAPPI



Endorsed by: MRS Materials Research Society

Royal National Sponsor: U.S. Forest Service, Department of Agriculture

Non-Financial Co-Sponsors: The Nonwovens Institute; ABTCP 2013

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Sustainable Solutions for Tomorrow´s Bioeconomy

The *only* conference that focuses exclusively on renewable nanomaterials

Learn about Current Applications:
- Unique and Thin-Film Composites from Cellulose Nanomaterials
- Filler and Coating Applications for Different Paper Grades
- Improved Barrier Properties for Packaging Applications
- Cellulose Nanomaterials as Films and Carriers in Medical Applications
- Nanopaper & Iridescent Colored Cellulose Films

Discover the Versatility of Renewable Nanomaterials:
- Wood-Based Cellulose Nanocrystals and Nanofibrils
- Bacterial Cellulose
- Fungal Chitin and Other Chitosan Derivatives

Commercialization Updates
- Production and Characterization of Cellulose Nanomaterials
- Evaluating Health and Safety Issues

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 Royal Institute of Technology
Jouni Paltakari, Helsinki University 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

Keynote Presenters:

David Lazarevic, *Division of Environmental Strategies Research and the Division of Industrial Ecology*, KTH Royal Institute of Technology, "Life Cycle Considerations of Nanomaterials: Possibilities for Evaluating the Environmental Impact Renewable Nanomaterials"

Arthur Carty, *Executive Director & Research Professor in the Department of Chemistry, Waterloo Institute for Nanotechnology, University of Waterloo, Special Advisor to the President on International Science and Technology Collaboration,* "Small World, Large Impact: Driving a Materials Revolution through Nanotechnology"

Katja Salmenkivi, *Pöyry Management Consulting,* "Towards High-Value Applications of Nanocellulose: A Player and Patent Landscape Approach"

Tom van Teunenbroek, *Ministry of Infrastructure and Environment, The Netherlands,* "Nanosafety Research and Legislation in European Union: Future Activities"

Martha Marrapese, *Keller and Heckman, USA,* "Key Considerations for Successful Technology Transfer of Nanocellulose"

TAPPI International NANOtechnology Division

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TECHNICAL PROGRAM

(Subject to Change. To view the most current program schedule go www.tappi.org/13nano)

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

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 Royal Institute of Technology*, "Life Cycle Considerations of Nanomaterials: Possibilities for Evaluating the Environmental Impact Renewable Nanomaterials"
  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-Conil,*** FCBA
- Water Redispersable Dried Nanofibrillated Cellulose, ***Julien Bras,*** Grenoble INP Pagora - LGP2 (FSCN)

9:00 – 10:30 F2

Session 3: Self and Directed Assembly of Nanocellulose

Session Chair: Eero Konturri, Aalto University

- Tailoring of Supramolecular Iinteractions 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
- 2-Dimensional Nanoscale Structures from Cellulosic Materials, ***Eero Kontturi,*** Aalto University

10:30 – 11:00 BREAK

11:00 – 12:30 F1

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
- Cellulose Nanocrystal Reinforced Cementitous Materials ***Jeffrey P. Youngblood***, Purdue University
- 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.

11:00 – 12:30 F2

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)

TAPPI International NANOtechnology Division

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, University of Waterloo, and Special Advisor to the President on International. Science and Technology Collaboration,* "Small World, Large Impact: Driving a Materials Revolution through Nanotechnology"

Session Chair: **Robert Moon,** US Forest Products Laboratory

14:00 – 15:30 F1

Session 7: CNF Composite Processing

Session Chair: Alain Dufresne, Grenoble Institute of Technology

- Membranes from Renewable Resources for Water-Purification, ***Andreas Mautner,*** Imperial College London
- Super-Strong Soy Protein/Nanocellulose Composite Aerogels, ***Julio Arboleda***, North Carolina State University
- Hemicellulose Acetates as Matrix/Binder for Nanofibrillated Cellulose Reinforced Composites, ***Agnes Stepan,*** Chalmers University of Technology
- Hydrophobic Nanofibrillated Cellulose-Based Nanopaper Through a Mild Chemical Functionalization Approach, ***Houssine Sehaqui,*** EMPA

14:00 – 15:30 F2

Session 8: Nanocellulose-Organic/Inorganic Hybrids

Session Chair: Marie-Pierre Laborie, University of Freiburg

- Hydrogelation of Carboxylated Cellulose Nanofibrils Modulated by Metal Ions, ***Hong Dong,*** U.S. Army Research Laboratory
- Magnetic Cellulose Nanocrystal Hybrid, ***Tiina Nypelö,*** North Carolina State University
- ZnO-Bacterial Cellulose Nanocrystal Composite and its Potential as Energy Harvesting Material, ***Levente Csoka,*** University of West Hungary
- Atomic Layer Deposition on Cellulose Nanocrystal Aerogels, ***John Simonsen,*** Oregon State University

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-Fibrillate d 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
- 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

TAPPI International NANOtechnology Division

17:30 – 19:30 Foyer

Session 11: Conference Reception, Poster Session and Exhibitor Displays
Session chair: Martti Toivakka, Abo Alkademi University
Over 50 posters will be presented at the conference. See list on page 8-10

Wednesday, 26 June 2013

F1/F2 Conference Rooms, Lindstedtsvägen 22, KTH Campus

8:00 – 8:45 F1

Session 12: Keynote Presentation
Keynote Speaker: **Katja Salmenkivi,** *Pöyry Management Consulting,*
"Towards High-Value Applications of Nanocellulose: A Player and Patent Landscape Approach"
Session Chair: Ulla Forsstrom, VTT Technical Research Centre of Finland

9:00 – 10:30 F1

Session 13: CNF Processing for Paper Webs
Session Chair: Jouni Paltakari, Aalto University

- Processability of Nanocelluloses, ***Ari Jäsberg,*** 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,*** Se

9:00 – 10:30 F2

Session 14: CN Composites
Session Chair: 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 & Fillers
Session Chair: Sean Ireland, Verso Paper Corp.

- MFC Labelling, Retention and Distribution in Paper, ***Juha Salmela,*** VTT Technical Research 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, ***Katariina Torvinen,*** VTT Technical Research Centre of Finland

11:00 – 12:30 F2

Session 16: CNF Barrier
Session Chair: Julien Bras, Grenoble INP Pagora - LGP2 (FSCN)

- Use of cellulose Microfibrils in the Development of Barrier Materials – Benefits and Challenges, ***Céline Guézénnec,*** Centre Technique du Papier
- Green Barrier Coating and Film of Microfibrillated Cellulose (MFC) and Its Composites, ***Yulin Deng,*** Georgia Institute of Technology
- Nanocellulose Films and Coatings with Tunable Oxygen and Water Vapor Permeability for Use in Renewable Packaging Solutions, ***Christian Aulin,*** Innventia AB

TAPPI International NANOtechnology Division

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

Session 17: Keynote Presentation

Keynote Speaker: **Martha Marrapese,** *Keller and Heckman, USA, "Key Considerations for Successful Technology Transfer of Nanocellulose"*

Session Chair: World Nieh, US Forest Service, "Key Considerations for Successful Technology Transfer of Nanocellulose"

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 University and LSU AgCenter

15:30 – 16:00 BREAK

16:00 – 17:30 F1

Session 20: CN Modeling

Session Co-Chairs: Stan Stoyanov and Andriy Kovalenka, 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
- Multiscale Modeling of Solvation Structure and Thermodynamics of Cellulose Nanocrystals in Solution: Dispersion, Functionalization, ***Sergey Gusarov,*** National Institute for Nanotechnology
- Micro-Rheology of Nanocellulose Suspensions with Smoothed Particle Hydrodynamics Simulation, ***Jukka Ketoja,*** VTT Technical Research Centre of Finland

16:00 – 17:30 F2

Session 21: Safety 2

Session Chair: Brian O´Connor, FPInnovations

- Consumer, Health and Safety perspectives: Recent results related to nanofibrillar cellulose, ***Juulia Rouhiainen,*** Poyry Management Consulting Oy
- Different products – common concerns? Negotiating nanosafety, ***Petrus Kautto,*** Finnish Environment Institute
- 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.

TAPPI International NANOtechnology

18:30 – 22:00

Session 22: Conference Dinner at the Vasa Museum

Included in your registration rates, except for single day and student registrations, is an evening at the Vasa Museum. On 26 June, you and your fellow delegates will tour the museum and dine alongside the Vasa. Transportation to and from the event is included.

The Vasa sank on her maiden voyage in 1628 in Stockholm and was salvaged in 1961; a giant puzzle to be reassembled. There were no plans or contemporary pictures of the ship, so the restorers had to work directly from the remains. Thousands of loose pieces from the collapsed upper parts of the hull were raised and conserved, and then the right places for them had to be found on the ship. Today, the wood of Vasa is more than 95% original timber. In addition to the ship and the longboat (esping in Swedish), the Vasa Museum's collections include over 45,000 loose finds.

Thursday, 27 June 2013

F1/F2 Conference Rooms, Lindstedtsvägen 22, KTH Campus

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 Technical Research Centre of Finland

- 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 University of Technology
- The Properties of Paper Coating Layers That 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

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 Abrahim-Vieira,*** Faculty of Pharmacy of University of Coimbra
- Cellulose Nanoparticle Based Ester Prodrugs for 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***

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

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

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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

POSTERS

Effect of Annealing on the Structural, Magnetic and Magnetocaloric Effect in Ni49Mn38Sn13 Ribbons Heusler Alloy.- ***Mst Nazmunnahar,*** University of Basque Country(UPV/EHU)

Nanoemulsion Based-Biopolymers for Oral Delivery of Insulin-***Barbara Azevedo Abrahim-Vieira,*** Faculty of Pharmacy of University of Coimbra

Influence of Chemical Grafting of NFC on Antibacterial Activity-***Seema SAINI,*** Grenoble INP Pagora - LGP2

Immobilization of Amino-Containing Functionalities onto the External Surface of MCM-41-***Nadiia V. Roik,*** Chuiko Institute of Surface Chemistry of NAS of Ukraine

Production of Oxygen Scavenging Board Containing Enzymes Coupled to Nanoparticles-***Kristin Johansson,*** Karlstad University

Sustainable corrosion protection by superhydrophobic AKD based coatings in different wetting states-***Agne Swerin,*** SP Chemistry

Preparation of Chitin Nanofibers and Nanocomposite from Shrimp Shell Wastage-***Subir Kumar Biswas,*** Asian Institute of Technology

Size and Flow Properties Control of Nanofirillated Cellulose from Date Palm Tree by Control TEMPO- Mediated Oxidation Time-***Karima Ben Hamou,*** International School of Paper, Print Media and Biomaterials

Use of Different Quality of MFC for Producing Controlled Release Films-***Nathalie Lavoine,*** Grenoble INP Pagora - LGP2

Effect of Nano Particle Size Zinc Oxide Coating on Optical Properties and Printing Characteristics of Paper-***Dharm Dutt,*** IIT Roorkee

Current Understanding and Critical Gaps in Environmental, Health and Safety Issues for Nanomaterials-***Juulia Rouhiainen,*** Poyry Management Consulting Oy

Influence of Poly(Vinyl Alcohol) on Suspensions of Nanofibrillated Cellulose and Subsequent Spray Drying-***Lars M. Jarnstrom & Dr. Henrik Ullsten,*** Karlstad University

Reinforcing Nanocellulose Isolated from Banana Rachis and Corn Husk-***Robin Zuluaga Gallego,*** Pontificia Bolivariana University

Hydrophobization of Cellulosic Substrates by Creating Surface Nanostructures Using Enzymatic Methods-***Oriol Cusola,*** Universitat Politècnica de Catalunya UPC-BarcelonaTech

POSTERS CONTINUED ON NEXT PAGE

POSTERS

A Biotechnological Approach to Produce High Cellulose-Content NFC from Alkaline Pulps- ***Facundo Beltramino,*** Universitat Politecnica De Catalunya

Effect of Enzyme Concoctions on Deinking Efficiency and its Relationship with Nano-Variations on Fiber Surface Roughness- ***Dharm Dutt,*** IIT Roorkee

AFM Imaging and Analysis of CNF Reinforced Films Under Strain- ***Michael Obersriebnig,*** BOKU Vienna

Exploring the Bleaching Possibilities of Dissolving Grade-Pulps by Means of Enzymatic Treatments- ***Elisabet Quintana,*** Universitat Politecnica De Catalunya

Comparative Study of Obtaining Cellulose Nanofibers from Curaua Fibers by Enzymatic and Acid Hydrolysis- ***Ana Carolina Correa,*** Embrapa Instrumentation

Thermal Properties and Antioxidant Potential Evaluation of Dioxane Lignin Nanoparticles: Matrix Material for Controlled Release of Agrochemicals.- ***Srinivasa Rao Yearla,*** University of Hyderabad, ***Kollipara Padmasree,*** Department of Biotechnology, School of Life Sciences, University of Hyderabad

Mechanical Properties of High Yield Pulp Handsheets, as Affected by Blends of Nano-Ligno Cellulose, ***Sinke Osong,*** Mid Sweden University, Fibre Science and Communication Network (FSCN)

Scope of Zinc Oxide Nanoparticle Coating in Library and Information Science for Preservation of Paper Based Resrouces.- ***Suchismita Majumdar Mandal,*** Sir Gurudas Mahavidyalaya

Swelling Behavior of Wood Pulp Fibres in an Acidic Ionic Liquid (IL)/ Water Systems- ***Jia Mao,*** University of Freiburg

Optimization of the Production of Cellulose Nanowhiskers from Wood Pulp Fibers by Mean of an Ionic Liquid/Water System- ***Jia Mao,*** University of Freiburg

Investigation of Different Post Treatments of Nanocrystalline Cellulose in Order to Obtain Narrowly Dispersed Rods- ***Raphael Bardet,*** Grenoble INP Pagora - LGP2

Influence of residual Lignin and Specific Surface Area of Nanocellulose Fillers on Urea-Formaldehyde Bonding of Wood- ***Heiko Winter,*** University of Freiburg

Silver Nanoparticles on Glass and Paperboard Substrate for Surface-Enhanced Raman Scattering (SERS) Sensing- ***Jarkko J Saarinen,*** Abo Akademi University

Novel Materials Based on Nanocellulose- ***Marcus Ruda,*** SweTree Technologies AB, ***Asa Ek,*** Cellutech

Organosolv Pulping of Norway Spruce for Nanocellulose Production: Kinetic and Mechanistic Study- ***Hatem Abushammala***, University of Freiburg

Tailoring the Mechanical Properties of Tannin-Based Foams with Natural Additives- ***Ricarda Bohm,*** University of Freiburg / Freiburg Materials Research Center

Chitosan Derivatives Nanoparticles for Removal of Toxic Metal Ions from Industrial Wastewater- ***Julius Ratumo Toeri,*** University of Freiburg

Antifungal Properties of Copper-Carbon Core-Shell Nanoparticles against Forest Pathogens- ***Yadong Qi,*** Southern University

Nanotechnology and Implications in Sustainable Development – ***Arezki Benfdila,*** University M. Mammeri Tizi-Ouzou

Nanolayer Characterization of Materials using Electron Spectroscopy for Chemical Analysis (ESCA)- ***Vijay Kumar Kaushik,*** Parul Institute of Engineering and Technology

Surface and Total Charge Density of Functionalized Nanofibrillar Cellulose Dispersions-***Karoliina Junka,*** Aalto University

POSTERS CONTINUED ON NEXT PAGE

POSTERS

Improved Bleachability of Bagasse and Cotton Stalk - Zenat Adeeb Nagieb, National Research Center Molecular Junction-***Shu Han Hsu,*** National Device Laboratory

Reinforcement of Wet Milled Jute Nanofibrils in Poly Lactic Acid (PLA) Films-***Vijaykumar Baheti PhD Student,*** Technical University of Liberec

Mechanical Properties of NFC Suspension and Wet NFC Sheet-***Ryu Jaeho,*** Seoul National University, South Korea

Multifunctional Bamboo Rayon-Copper Nanoparticles Composite Fabric Using Grafting as a Tool-***Javed N. Sheikh,*** Institute of Chemical Technology

Surface Modification of Nanocrystalline Cellulose (NCC) by a Quaternary Ammonium Salt-***Alireza Kaboorani,*** Universite Laval

Microfibrillated Cellulose (MFC) from Triodia Pungens, an Australian Native Grass-***Nasim Amiralian,*** University of Queensland

Microwave-Assisted Upgrading of Bio-Oil Produced from Renewable Resources Using Nanostructured Zeolite Catalyst-***Dorin Boldor*** LSU and LSU AgCenter

Nanotechnologies for Renewable Materials – Industrial Innovation, Patents and Standardisation-***David Carlander,*** Nanotechnology Industries Association

Poly-Flavonoids Derivatives as Potential Sustainable bio-Based Building Blocks-***Danny E. Garcia-Marrero,*** University of Freiburg

Self-Assembly of Cellulose Fibrils/SiO2 Nanoparticles During Synthesis by Gluconacetobacter Bacteria- ***Robin Zuluaga Gallego,*** Pontificia Bolivariana University

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-***Stanislov Stoyanov,*** National Institute for Nanotechnology

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

New Route for Preparation of Aerogels from Hemicelluloses-***Abdul Ghafar***, University of Helsinki

Structural Lithium Ion Battery Electrolytes Reinforced by NFC-Aerogels-***Markus Willgert***, KTH Royal Institute of Technology

Nanostructured Biocomposite Materials of Poly (e-Caprolactone) and High Surface Area Nanopaper-***Assya Boujemaoui***, KTH Royal Institute of Technology

Physical Tuning of Cellulose-Polymer Interactions Utilizing Cationic Block Copolymers Based on PCL and Quaternized PDMAEMA-***Carl Bruce***, KTH Royal Institute of Technology

Wood Hydrolysate - Montmorillonite Barriers for Food Packaging Applications Under High Humidity Conditions-***Anas Ibn Yaich***, KTH Royal Institute of Technology

TAPPI International NANOtechnology

2013 TAPPI INTERNATIONAL CONFERENCE

On Nanotechnology for Renewable Materials

24-27 June 2013

KTH Royal Institute of Technology • Stockholm, Sweden • www.tappi.org/13nano

This year's technical program features presentations and posters from these leading institutions:

Aalto University	National Research Center
Abo Akademi University	National Research Council Canada
Alberta Innovates Technology Futures	NIST
Asian Institute of Technology	North Carolina State University
BOKU Vienna	Omya Development AG
Cellutech	Oregon State University
Centre Technique Du Papier	Paper and Fibre Research Institute
Chalmers University of Technology	Papiertechnische Stiftung (Heidenau)
Chuiko Institute of Surface Chemistry of NAS of Ukraine	Parul Institute of Engineering and Technology
CLF Ventures Inc	Polymer and Composite Group, Imperial College London
Embrapa Instrumentation	Pontificia Bolivariana University
EMPA	Poyry Management Consulting Oy
Faculty of Pharmacy of University of Coimbra	Purdue University
Finnish Environment Institute	Seoul National University
FPInnovations	Sir Gurudas Mahavidyalaya
Georgia Institute of Technology	Southern University
Grenoble INP Pagora - LGP2	Tampere University of Technology
Grenoble Institute of Technology	Technical University of Liberec
IBM Materials Engineering	U.S. Army Research Laboratory
IIT Roorkee	Universitat Politècnica de Catalunya UPC-BarcelonaTech
Imperial College London	Universite Laval
Innventia AB	University M. Mammeri Tizi-Ouzou
Institute of Chemical Technology	University of Alberta
International School of Paper, Print Media and Biomaterials	University of Basque Country(UPV/EHU)
JSS Mahavidyapeetha	University of Freiburg / Freiburg Materials Research Center
Karlstad University	University of Fribourg
KTH and Institute for Surface Chemistry (YKI)	University of Hyderabad
Lappeenranta University of Technology	University of Maine
Louisiana State University and LSU AgCenter	University of Natural Resources and Life Sciences
LSU and LSU AgCenter	University of Oulu
McGill University, Department of Chemistry	University of Queensland
McMaster University	University of Tennessee
Melodea Ltd.	University of Warwick
Mid Sweden University	UPM Corporation
Monash University	US Forest Products Laboratory
Nanotechnology Industries Association	VTT Technical Research Centre of Finland
National Device Laboratory	Wallenberg Wood Science Center
National Institute for Nanotechnology	West Virginia University

TAPPI International NANOtechnology Division

2013 TAPPI INTERNATIONAL CONFERENCE

On Nanotechnology for Renewable Materials

24-27 June 2013

KTH Royal Institute of Technology • Stockholm, Sweden • www.tappi.org/13nano

Hotel
Preferred Hotel:
Elite Hotel Arcadia
Telephone: +46 8 566 215 00
Address: Körsbärsvägen 1, 114 23 Stockholm
Website: http://www.elite.se/eng/node/1403
Located 850 m, about an 11 minute walk from the KTH Royal Institute of Technology.

TAPPI has a limited number of discounted guest rooms blocked at the Elite Hotel Arcadia in Stockholm. Rates and information are as follows:

Superior Guest Room Rate: 207 USD*/1390 SEK per night. Room rate includes internet access and a free breakfast buffet.
* USD room rate subject to change based on exchange rate.

Please be sure to use the booking code 1325721 when booking your room in order to receive our discounted rate.

Reservations may be made over the phone at +46 8 566 217 40 or by email at reservation.arcadia@elite.se.

Reservations must be made by Monday,15 April 2013 in order to receive the TAPPI discounted rate.

Other Hotel Options
Delegates may choose to book their hotel stay at a hotel other than our preferred conference hotel. Please be advised that TAPPI has only blocked rooms at a discounted rate at the Elite Hotel Arcadia.

Scandic Park
Telephone: +46 8 517 348 00
Address: Karlavägen 43, 102 46 Stockholm
Website: http://www.scandichotels.se/Hotels/Countries/Sverige/Stockholm/Hotels/Scandic-Park/
Located 1.2 km, about a 16 minute walk from the KTH Royal Institute of Technology.

Clarion Hotel Tapto
Telephone: +46 8 664 50 00
Address: Jungfrugatan 57, Stockholm, SE, 115 31
Website: http://www.clarionhotel.com/hotel-stockholm-sweden-SE018
Located 1.4 km, about a 17 minute walk from the KTH Royal Institute of Technology.

Elite Stockholm Plaza
Telephone: +46 8 566 220 00
Address: Birger Jarlsgatan 29, 111 45 Stockholm
Website: http://www.elite.se/eng/node/704
Located 1.4 km, about a 17 minute walk from the KTH Royal Institute of Technology.

Traveling to Stockholm
Stockholm International Airport is Arlanda (ARN). Visit the Hotel and Travel section on www.tappi.org/13nano for transportation options from Arlanda to Stockholm.

TAPPI PRESS Conference Bookstore
These special publications from TAPPI are available to the 2013 TAPPI International Conference on Nanotechnology for Renewable Materials attendees, most at a "conference only" discount. You can purchase these books when registering and pick them up when you arrive at the conference.

2011 TAPPI International Conference on Nanotechnology for Renewable Materials Proceedings CD
Order Code: 11NANOCD
List: $137 / **SPECIAL CONFERENCE PRICE:** $117 • **Member:** $100 / Special Conference Price: $80

2012 TAPPI International Conference on Nanotechnology for Renewable Materials Proceedings CD
Order Code: 12NANOCD
List: $137 / **SPECIAL CONFERENCE PRICE:** $127 • **Member:** $100 / Special Conference Price: $90

Nanotechnology Health and Environmental Risks
Order Code: 11NANOENV • **List:** $52 • **Member:** $42

Nano Science and Nano Materials: Synthesis, Manufacturing and Industry Impacts
Order Code: 12NSNM
List: $149 • **Member:** $129

Nanocellulose: From Nature to High Performance Tailored Materials
Order Code: 13NANOCELL
List: $196 • **Member:** $180

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2013 TAPPI International Conference on Nanotechnology for Renewable Materials
Registration Fees

Two easy ways to register for the conference:
1. Online at www.tappi.org/13nano
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 for details.

	Before 29 April 2013	30 April to 20 June 2013	After 20 June 2013
Member*	$995	$1,105	$1,197
Non-Member	$1,230	$1,435	$1,674
Join/Renew TAPPI and SAVE	$1,169	$1,279	$1,371
Single Day - Member**	$495	$495	$662
Single Day - Non-Member**	$700	$700	$838
Single Day - Join/ Renew TAPPI and SAVE**	$669	$669	$836
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
Group Discount - Join/ Renew TAPPI and SAVE (price per person for 3+ from same company)	$1,004	$1,004	$1,128
Speaker Full Conference	$675	$745	$857
Retired	$830	$830	$954
Student	$200	$200	$215
Spouse/Guest Registration includes Gala Ticket	$165	$165	$165
Ticket for Gala	$165	$165	$165

*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 29 April 2013. Please note: There will be a 50% refund for all written cancellations made after 29 April 2013 but no later than 5 business days prior to the start of the conference, 17 June 2013. Understandably, after this time, no refunds can be issued. Substitutions, however, will be accepted any time without a penalty.

Refund:
100% - Cancellation received by 29 April 2013
50% - Cancellations received after 29 April 2013 and no later than 17June 2013.
NO REFUND- Cancellations received after 17 June 17 2013.