

# 2024 International Conference on Nanotechnology for Renewable Materials

10–14 June 2024 | Atlanta, Georgia USA



## INVITATION TO PRESENT

### Conference Theme

*Building from the Bottom Up: Shaping a Sustainable World using Renewable Nanomaterials*

Abstracts are currently being accepted for the **2024 TAPPI Nanotechnology Conference**. TAPPI's Nano event continues to grow in attendance and quality of presentations. Please consider submitting an abstract for an oral and poster presentation to this premier event addressing the latest technical developments and applications of renewable nanomaterials. While primarily focused on cellulose nanomaterials (CNMs), submissions regarding other renewable nanomaterials are highly encouraged.

### **Special Topics for 2024**

The organizers of this year's conference are requesting abstract submissions in three additional focus areas:

**Development of CNM in Environmental Defense** – the development of cellulose nanomaterial in plant/crop protection (e.g., drought, fire, and pathogens), soil erosion, desert reclamation, biomass production.

**Preserving Product Quality in the Supply Chain** – dewatering technologies, temperature management, stability, redispersion, etc. during transportation and storage.

**CNMs in Functional Applications** – this topic is focused on understanding which cellulose nanomaterial (fibril or crystal) is needed to achieve desired performance in applications such as biomedical and electronics.

### **TECHNICAL PRESENTATIONS ON NEW RESEARCH FINDINGS**

*Topics where novel research and new findings are presented are preferred while literature reviews are not encouraged.*

*Please see the detailed list of suggested topics on the following:*

#### **Nanomaterial Production**

##### **Structure-processing-properties relationships & CNM Quality Assessment**

- Structure-processing-properties relationships of CNMs
- Stability of CNMs

##### **Dewatering and Drying**

- Drying CNMs (freeze drying, spray drying, supercritical drying, microwave drying, etc.)
- Dewatering (press, filtration, ultrasound, contact dewatering, etc.)

##### **Production of CNMs**

- Production of CNMs (MFCs, CNFs, CNCs, TEMPO-CNFs, etc.) and their lignin-containing versions such as LCNFs and LCNCs from various raw materials and through different techniques
- Efficient pretreatment methods to improve process throughput and productivity (different pretreatment methods e.g., enzymatic, chemical, thermal, hydrothermal, etc.)

##### **Energy Reduction Methods and Optimization Technologies**

- Methods to reduce energy demand
- Optimization of process
- Scale up of CNMs production

##### **Chemical Modifications: Pre-treatment, Post-production or In-situ**

- Pre-treatment of biomass
- In-situ modifications
- Post-production chemical modifications

## Nanomaterial Characterization

### Fundamental Properties at the Microscale and Nanoscale

- Measurement of intrinsic properties, such as surface chemistry, optical, thermal, mechanical, and other properties
- Key properties for comparison and benchmarking

### Metrology for Characterization at the Microscale and Nanoscale

- New metrologies
- Commercial measurement needs (online, quantitative, property control)
- Development of new measurement standards

### Matching Properties to Applications

- Materials specifications, regulations, and new standard characterization methods
- Evaluation of existing methods for usefulness and practicality

### Advanced Computing Analysis Tools

- Automated image analysis
- Modeling and simulation of nanomaterials
- Development of materials informatics platform (e.g., AI, integrated computing-experimental research, etc.)

## Applications and Product Development: CNFs & MFCs

### Polymer Composites

- Design and manufacture of reinforced matrices, micro- and nano-structural characterization, measurement of mechanical, physical and chemical behaviors, and the performance and durability of composites in service
  - Thermoplastic composites, such as polyolefins, polystyrene, and polyesters
  - Thermoset composites, such as epoxies and polyurethanes
  - Water-based polymer composites including polyvinyl alcohol and polyethylene oxide
  - Sustainable and bio-based and/ or biodegradable polymer composites, such as poly(lactic acid) and polycaprolactone

### Other Composites

- Inorganic matrices such as cement/concrete, sol-gels, metal-organic frameworks, etc.
- Other bio-based or hybrid matrices (alginates, starch, etc.)

### Pulp and Paper Products

- High CNF/MFC-content papers
- CNFs/MFCs as additives in papers/board

### Foams

- Rigid foams for insulation, sound dampening, packaging, etc.
- Soft/flexible foams for cushioning, impact resistance, packaging, etc.
- Composite foams, hybrid formulations, etc.

### Scaffolds

- Catalyst support
- Cell/tissue cultures

### Freestanding Films and Membranes

- Transparent/translucent films
- Barrier properties (oxygen, water vapor, grease resistance, etc.)
- Ion-exchange, battery separators
- Printed electronics
- Filtration (air and water)

### Coatings

- Barrier properties
- Substrates for printed electronics

### Adhesives and Binders

- CNFs/MFCs as binders for organic/inorganic particles/fibers
- CNFs/MFCs as additives in adhesives
- Adhesion mechanisms

### Other Products, Emerging Applications, and New Developments

## Applications and Product Development: CNCs, Lignin, and Other Renewable Nanomaterials

The following list of application areas are intended to provide examples only. Any applications for CNCs, lignin and other renewable nanomaterials not listed here should also be submitted.

### Product Development & Applications of Cellulose Nanocrystals

- CNCs, as mechanical fillers/reinforcing agents of (nano)composites for diverse applications
- Advanced functional CNC-based products and their potential applications
- From wet foams, Pickering emulsions to solid porous materials
- Photoactive and functional films and membranes
- Any other functional material and applications for CNCs, lignin and other nano bio-based materials

### Nanoscale Lignin in Advanced Functional and Sustainable Materials

- Colloidal lignin particles (or lignin nanoparticles) products & applications
- Technical lignins products & applications
- Native/residual lignins potential and opportunities in products development & applications

### Product Development & Applications of Other Renewable Nanomaterials

- Chitin & chitosan nanomaterials
- Wood/plant-based nanomaterials, from hemicelluloses and tannins to ashes
- Other renewable nanoparticles-based products and applications
- Bacterial nanocellulose

## EH&S, Product Stewardship, Standards & Regulations

### Risk Assessment and Safety

- Product and consumer safety
- Occupational safety
- Risk management
- Methods development

### Product Stewardship

- Sustainability assessment
- Safer-by-design
- Environmental management strategies
- Life cycle assessment
- Techno-economic analysis
- Biodegradability, recycling, and compostability strategies

### Standards Development

- Newly published standards, or standards in development
- Standards development needs and challenges

### Regulations

- Regulatory developments relevant to authorization and commercialization
- Impacts of regulation on commercialization
- Commercial strategies for regulatory acceptance of renewable nanomaterial products

## NEW TECHNOLOGY SHOWCASE

*Share your company's latest technologies and advances in the industry!*

Demonstrate your new products and services to attendees with an eight-minute presentation during the technical program. This technology must have been developed within the last year. Exhibitors who participate in the New Technology Showcase will have the first opportunity to present. Non-exhibitors who submit abstracts for this session will be conditionally accepted but won't be confirmed until after the exhibitor deadline of **13 May 2024**. After this date, non-exhibiting participants may present on new technology if space is available and will be selected at the discretion of the committee. Presentations will be reviewed for anti-trust, uniqueness and quality. This is a rare opportunity to showcase your company's new innovations and to speak directly to interested consumers. Abstracts are due on **08 January 2024** and will remain conditionally accepted until **13 May 2024**.

## STUDENT POSTER SESSION AND COMPETITION

*A Competition for Students and Young Professionals*

Are you a student, graduate student or young professional who has recently joined the renewable nanotechnology industry? Have you successfully conducted research, implemented a project or have an idea for a project that sustainably drives our industry forward? The student poster session is your opportunity to display your research work in poster format. The session is an ideal setting for conference attendees to view your work in an informal and conversational setting. Posters are judged by conference attendees and the top-ranking posters are eligible for prizes. All accepted posters will be evaluated at the conference by a team of judges. The poster winners will be recognized at the conference, and the top poster presenters awarded a prize.

[Click here](#) to see past winners. Abstracts are due on **08 January 2024**.

### CONFERENCE CO-CHAIRS

- Meisha Shofner, Georgia Tech
- Maria Soledad Peresin, Aurburn University
- Raquel Martin, INIA—CSIC

### ABSTRACT SUBMITTALS

Submissions are due by **8 January 2024**. Submissions must be received by the stated deadline to be considered for acceptance. Due to the large number of submissions received, the organizers cannot guarantee that the submission will be accepted. All submissions will be peer reviewed by the conference Co-Chairs and Nano Division Research Subcommittees for acceptance. Submit title and 300-word or shorter abstracts via TAPPI's [Speaker Management System](#).

### IMPORTANT DATES

- 08 January 2024** – Abstracts Due
- 04 March 2024** – Acceptance Letters Sent to Authors
- 15 April 2024** – Speaker Registration Deadline
- 13 May 2024** – Presentation Drafts Due to Session Chairs
- 03 June 2024** – Final Presentations Due to TAPPI

### REGISTRATION INFORMATION

Speakers must register by **15 April 2024** to confirm inclusion in the technical program. If speakers are not registered by this date, their presentation will be pulled from the program. A reduced conference rate is available for speakers. Visit the [conference website](#) for more information. To learn more about the Nano Division [click here](#).

### Questions?

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