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The state of cellulosic nanotechnology: June conference captures current and emerging trends

From June 12-16, 253 participants from 18 countries gathered in Vancouver, BC, Canada, for TAPPI's 2023 International Conference on Nanotechnology for Renewable Materials. Representatives from academia, industry, and federal research institutes could choose from among 140 technical presentations on production, characterization, applications, and functionalization of renewable nanomaterials.

Some of the most popular technical sessions were dedicated to nanocellulose films, cellulose nanocrystals (CNC)-based packaging materials and films, and packaging. Other highlights from the conference are described below.

Keynote speeches

There were four distinctive keynote addresses at the 2023 Nano Conference, many of which covered commercialized products.

- **Opening keynote:** Gurminder Minhas, managing director of Performance Biofilaments in Vancouver, briefed attendees on his company's journey since its launch, covering successes, challenges, and surprises that have occurred.
- **Beyond nano:** Dave Skuse, technology vice president at FiberLean Technologies in Par, UK, highlighted game-changing, sustainable opportunities made possible with industrial-scale microfibrillated cellulose (MFC) production units. These units, along with surface applicators, can achieve flexibility, strength, and new dimensions for existing, evolving, and new products.
- **From trees to tires:** Kim Nelson, chief technical officer of GranBio USA in Georgia and Lewis Tunnicliffe, product development manager for Birla Carbon in Atlanta, shared their recent joint development of the Nanocellulose Dispersion Composite (NDC™). This new masterbatch product was the result of a six-year joint development designed to address sustainability demands from the tire industry in terms of

improving tire rolling resistance and vehicle fuel economy, as well as utilization of sustainable, bio-derived materials.

- **Sustainable packaging:** Julien Bras, associate professor at Grenoble INP, spoke about the main challenges in the sustainable packaging industry and discussed how nanocellulose can be used to create promising solutions by providing examples from his R&D background.

Academic and research organization activities

University activities in the field of nanocellulose were prominent at the 2023 Nano Conference. There was an academic tour of the University of British Columbia, in collaboration with the BioProducts Institute, where attendees could explore campus laboratories dedicated to research and experimental development in nanotechnology. Additionally, a product showcase featured products and materials from labs at the following universities: Perdue, Maine, Sao Paulo, and Putra Malaysia.

Also, there were more than 48 presentations in the student poster session that focused on applications, characterization, and functionalization of cellulose and other renewable nanomaterials. Conference attendees voted on the student posters, and the winner was Ariane Fernandes of University of British Columbia for "Development of nanocellulose emulgels for oral health care applications." The runners-up presented on red wine vinegar waste for oxidation catalysis and cellulose nanofibril (CNF)-mycelium nanocomposites for heavy metal remediation.

In the research realm, there was a tour of the Noram BC Research Center showcasing the analytical lab, where processes such as lignin fractionation, micro-plastic separation, and CNC-related activities support carboxymethyl cellulose (CMC) manufacturing. Attendees also explored the pilot plant to view mass transfer processes, cross flow filtration, and CO₂ sequestration.

Other activities at the 2023 Nano Conference

In addition to the activities previously mentioned, there was an expert panel discussion around end-user issues and requirements, as well as another expert panel that discussed how to navigate international nanomaterial regulations and ongoing characterization changes. Additionally, two workshops, one on nanomaterial characterization and one on cellulose nanomaterials in packaging, featured instructors from academic, research, and industry organizations.

TAPPI's Nanotechnology Division presented several awards. Soydan Ozcan of Oak Ridge National Laboratory received the Technical Award & FiberLean Technologies Prize, and Emily Cranston of the University of British Columbia received the Leadership & Service Award. The Mid-Career Award went to Feng Jiang of the University of British Columbia. Keith Guorlay of Performance Biofilaments received the Young Professional Award, and Eupidio Scopel of the University of Campinas was the recipient of the Student Award.

Get involved in TAPPI's Nano Division – and webinars

There are many opportunities to get involved with TAPPI's Nanotechnology Division as a member, specific committee participant, or conference technical program planner. For more information, [visit here](#) or contact [Natasha Bush-Postell](#), TAPPI's division manager for Nanotechnology, Pulping, & Engineering.

The next International Conference on Nanotechnology for Renewable Materials will be held June 10-14, 2024, at the Westin Buckhead in Atlanta, GA. However, if you would like to share your nanotechnology or research developments before then, TAPPI has webinar openings from August through November. If you are interested in presenting a webinar, [please fill out this form](#) and contact [Natasha Bush-Postell](#) or [Tiffany Abitbol](#), Nano webinar chair. **TJ**

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