



TAPPI Nano Student Committee **NANO 360°**



WELCOME

A message from your Student Committee

Welcome new and old readers alike.

Since the TAPPI Nano Conference in Vancouver is coming up, we decided it was about time to introduce the new Student Committee team, highlight more outreach events and share some exciting recent advances in nanocellulose research

We hope you enjoy

STUDENT UPDATES

The next coffee break is scheduled for September. Stay tuned to our social media for more information.

STUDENT OPED

The student committee presents the poster competition winners. They shared their outstanding research with us.

Page 3

HIGHLIGHT OF THE CONFERENCE REPRESENTATIONS

The Student Committee reveals the standout moments from the groundbreaking 2023 TAPPI Nano conference.

Page 4

Student Committee Updates

Mission and Vision

The Nano Division Student Committee is dedicated to providing a global network that connects students and young professionals around the world, facilitating knowledge exchange, providing useful tools, advice, and encouragement, so that students pursue careers that advance the use of renewable and sustainable nanomaterials.



Emilien Fréville
Co-Chair



Robyn Hill
Co-Chair



Eupídio Scopel
Vice CoChair



Yufei Nan
Vice CoChair



Gili Bar
Engagement CoChair



**Julia Pescheux
Sergienko**
Engagement CoChair



Javier Rodriguez
Secretary



Anderson Veiga
Secretary



Ariane Fernandes
Member at Large



Xia Sun
Member at large



Yuhang Ye
Member at large

STUDENT COMMITTEE ACTIVITIES

Mentorship Coffee Breaks: It is meant to provide open doors for professional development and mentorship opportunities. This hour-long online session gives students and young professionals insight into the diverse career paths available to them after graduation. The coffee break speakers discuss their career paths and what inspired them towards the work they are doing with nanocellulose.

The next coffee break will be on September. Stay tuned on the student committee social media for further information.

The student committee would like to thank the attendees of the conference and all the committee members for the remarkable 2023 conference.

We would like to express our gratitude to the speakers, presenters, panelists, researchers, and audience members for sharing their expertise and insights, fostering a collaborative atmosphere. We also thank the organizing committee, sponsors, and partners for their invaluable support. Your dedication and enthusiasm made this conference a memorable experience. We look forward to future collaborations and advancements in the field inspired by the connections made during this event. Thank you for being part of this remarkable conference.

Student OP-ED

Students from around the world are recognized for their outstanding research

Every year at the NANO conference, the student committee organizes and manages the student poster competition, where research posters are evaluated based on their research, goals, approach, clarity of content, and quality of presentation. In a show of support, this year's conference poster award was sponsored by the Renewable BioProducts Institute from Georgia Tech, the student committee, and the Nano Division. They express their heartfelt gratitude for the unwavering support from our sponsors whose continuous contributions have been instrumental in making this event possible and successful. In the 2023 conference, the committee had the pleasure of awarding the prize to three outstanding PhD students from the University of British Columbia (UBC): Ariane Fernandes, Marina Mehling, and Victoria French. These talented students have made remarkable achievements in their respective fields, and their accomplishments will be featured in this open-Ed, providing a platform to showcase their groundbreaking work and inspire others in the field.

At the BioProducts Institute, these three exceptional individuals are immersed in cutting-edge research of valorizing cellulose BioProducts. Ariane Fernandes, our first-place winner, has Emily Cranston as her advisor. Her project focuses on exploiting the potential of cellulose nanocrystals in developing dental materials for the prevention of dental plaque. Ariane emphasizes the significance of this research by stating, "Dental plaque is the leading cause of tooth decay, a pervasive disease affecting over 30% of the global population. Finding a safe approach for daily use to combat dental plaque is crucial in mitigating tooth decay." With a background in Pharmaceutical sciences, Ariane has dedicated herself to translating her knowledge and expertise into working with sustainable materials. Throughout her academic journey, she has aspired to showcase the feasibility of therapeutic approaches rooted in sustainability,

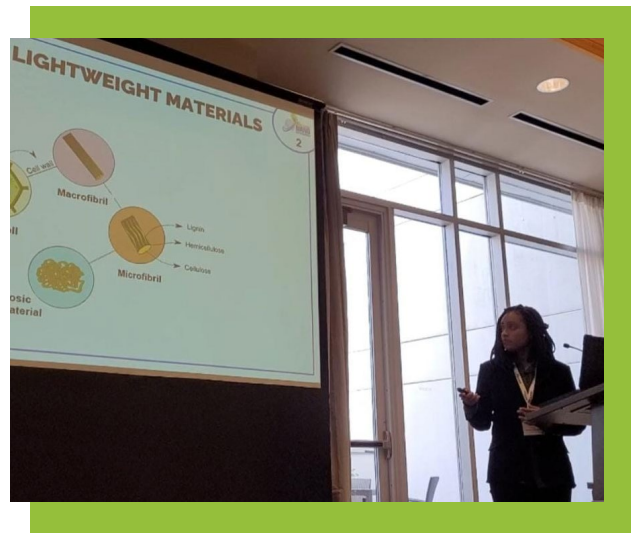


stating, "The primary goal of my PhD is to demonstrate that it is not only possible but imperative to develop therapeutics based on sustainable principles. We can and should prioritize sustainability in our research." By highlighting their innovative work, these researchers exemplify the transformative potential of sustainable materials in addressing pressing global challenges. Victoria French, also from UBC, received the third place in the competition. Her dedication to sustainable biobased materials is evident in her research on CNF-Mycelium Nanocomposites for Heavy Metal Remediation. Victoria recognizes the paramount importance of water remediation, highlighting its significance by stating, "Water remediation is a critical area as it is crucial to treat water for ourselves and future generations." Her research endeavors to develop innovative solutions for addressing heavy metal contamination in water sources, exemplifying the vital role that sustainable materials can play in safeguarding our environment and ensuring a better future for all.

The committee is delighted to have had the opportunity to engage with the winners and learn more about their remarkable research. Their groundbreaking work in sustainable biobased materials demonstrates their commitment to addressing critical global challenges. The committee eagerly looks forward to the next poster competition, where we anticipate the emergence of new ideas and discoveries that will further propel the field of nanotechnology forward.

Advances in Nano-cellulose Research

The student committee reveals the standout moments from the groundbreaking 2023 TAPPI Nano conference.



Polianna Ferreira from University of Campinas, Brazil.

Polianna S. Ferreira (University of Campinas, Sao Paulo, Brazil) “Effect of Cellulose Nanofibrils and Lignin Nanoparticles on the Properties of Lightweight Materials for Oil/Water Separation”.

This study showed the possibility of producing sustainable lignocellulose-based materials combining the presence of cellulose and lignin in different scales (micro and nanometric) as potential material for oil sorption. Usually, lightweight materials based on lignocellulose fibers perform low mechanical resistance under stress and absorb both water and oil. For this reason, they employed cellulose nanofibrils (CNF) as a nanofiller along with lignin nanoparticles (LNP) which enhanced the hydrophobic properties. By doing so, a promising environmentally friendly alternative for producing lignocellulose-based materials may be produced.

Darren Martin (University of Queensland, Brisbane, Australia) “Sustainable Production of Non-wood MFC Biocomposites for Compostable Personal Care and Packaging Applications”.

MFC are produced from agricultural side products of sorghum. Sorghum is an annual plant cultivated on 42 M ha in 105 countries around the world. It is an abundant, resilient, amenable and low cost product. Sorghum side products are introduced in a twin-screw extruder (TSE) equipped with high shear profiles screws at 20 wt% solid content in a mild alkali media to enhance the nanofibrillation in the TSE. Extruded MFC are then compounded with PHA powder in the TSE. The composite pellets are injected in a dog-bone sample to perform mechanical characterization. 5% MFC in the PHA doubled the tensile stress compared to neat PHA from 10 MPa to 20 MPa. The final application is to inject compostable razor blades. Compostable films were realized from thermoplastic starch compounded with 2% of MFC, the Young's modulus was doubled compared to the neat TPS from 120 MPa to 270 MPa. This is a very promising study to be followed due to the very low cost production of MFC.

François Drolet (FPInnovation)'s "Production Of Translucent Films from Cellulose Filaments for Packaging Applications. Part 1: Development of properties"

In a captivating talk presented by Francois Drolet, we delved into the world of cellulose filaments and their transformative role in film production for packaging applications. The presentation shed light on the intriguing relationship between the properties of cellulose filaments and the resulting film properties. Of particular interest was the exploration of how the film's surface influenced its opacity, with an intriguing discovery that calendaring the films led to a decrease in opacity. Furthermore, we gained valuable insights into the development of an industrial process for creating films from fibrillated cellulose, with a focus on selecting the most optimal materials to achieve exceptional film quality."

Workshop Highlight: Opportunities for Cellulose Nanomaterials in Packaging

Dr. Nicole Stark and Dr. Ron Sabo, esteemed experts from the US Forest Service's Forest Products Laboratory, hosted an engaging workshop on the potential of cellulose nanomaterials (CNMs) in the packaging industry. This comprehensive session offered participants a comprehensive introduction to CNMs, along with a deep dive into their specific applications. Attendees gained valuable knowledge on ongoing research surrounding CNMs and their ability to provide desirable barriers to oxygen, water vapor, and grease. The workshop also highlighted the challenges that researchers, producers, and end users face, paving the way for innovative solutions and future advancements in this field. The lively group conversation that followed was an excellent opportunity for participants from diverse backgrounds to exchange ideas and explore the vast potential of cellulose nanomaterials. We hope you found these insights as fascinating as we did! Stay tuned for more updates and intriguing presentations as we continue to explore the exciting world of cellulose-based packaging materials.

REACH US!

We hope to meet you soon!
but in the meantime, follow us on social media to get the latest information!



www.linkedin.com/in/TAPPINANOSTUDENTCOMMITTEE



<https://twitter.com/TAPPINanoStdnts>



tappinanostudents@gmail.com