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Message from the President



The legacy that keeps SNO being sustainable

SNO will have its upcoming 15th Annual Conference soon in 2027. At the SNO conference, we have seen young scholars exhibiting excellent sciences in academic and industrial fields, new generations bringing in talents and science discovery to furnish nano fields in broad aspects way beyond where we started in the early 2000s. I have been in our big SNO family since it was founded by

Dr. Barbara Karn and Dr. Wunmi Sadik, and had the chance to know every nano scientist who furthered technology development in the past decades. SNO is a warm society, where we welcome everyone, collaborate and work together with joy. This is my home society. It keeps me coming back, being excited to contribute and having fun every time we meet.

The SNO Governor is growing with many young scientists from newer generations with multi-disciplinary expertise joining us to continue our legacy.

We welcome Dr. Nirupam Aich from University of Nebraska-Lincoln with PFAS expertise in environmental engineering; Dr. Lok Pokhrel from East Carolina University with public health and toxicity expertise; Dr. Wen Ma from Université de Sherbrooke in Canada with environmental engineering expertise; Dr. François Perreault from Université du Québec à Montréal in Canada with environmental chemistry expertise; Dr. Omer Sadak from Clemson University with food, nutrition and packing sciences expertise; Dr. Tiezheng Tong from Arizona State University with Sustainable Engineering expertise; and Dr. Boya Xiong from University of Minnesota with polymer science expertise. We thank you for the continuous efforts of Drs. Achintya Bezbaruah, Vinka Craver, Mariya V Khodakovskaya, Barbara Karn, Omowunmi Sadik, Sudipta Seal, and Xing Xie as Board Members.

Regarding the 15th SNO Conference, one of our young investigator awardees, Dr. Nirupam Aich, is co-chairing with Dr. Sadak. In addition, going forward, the SNO conference will be held in March instead of November. We are making this change to bring in a fresh setting in a different season and prepare the conference to be held in a Midwest state, Minnesota, in 2027.

After more than 15 years of SNO, we are growing to serve the next generation of scientists and communities, as well as engage students beyond nano with our legacy. Thanks to the efforts of Dr. Karn, Dr. Sadik, and numerous others that have come after, we have built a tightly knit organization that has furthered the development of science, engineering, and health, and we hope to continue that legacy long into the future.

Candace Tsai

SNO conference preview 2027

Conference Organizers:

- Nirupam Aich, Conference Co-Chair
- Omer Sadak, Conference Co-Chair
- Candace Tsai, SNO President

Call for Technical Session Proposals The Sustainable Nanotechnology Organization (SNO) invites proposals for technical sessions for the **15th SNO Conference**, which will be held in **Minneapolis, Minnesota (USA), from March 25–27, 2027**.

SNO welcomes proposals for new technical sessions and invites volunteers to serve as session chairs or co-chairs. Each proposed session should include at least 10 committed speakers.

The current technical program includes the following session topics:

1. Tribute Session: Center for Sustainable Nanotechnology
2. Early Career Researchers' Spotlight
3. Sources, Fate, and Effects of Micro/Nanoplastics
4. Nano-Enabled Materials and Processes for Circular Plastics
5. Safe and Sustainable Nanotechnology for Environmental Applications
6. AI/ML and Computational Chemistry for Nanotechnology Applications
7. Nano-Bubbles Theory and Applications
8. Nanotechnology for Energy & Decarbonization
9. Nano-Agriculture and Nano-Bioeconomy (Ag/Food/Energy)
10. Nanotechnology for Circular Economy: Critical Minerals and Resource Recovery
11. Translations of Nanotechnology from Lab to Industry
12. Nanomedicine & Environmental Health
13. Quantum Science and Engineering
14. Nano-Education, Outreach, and Workforce Development

To submit a proposal, please send the session title, chair(s)/co-chair(s), and a session description of 4–5 sentences session description by **September 15, 2026** to nirupam.aich@unl.edu and osadak@clemson.edu.

We encourage members of the SNO community to contribute to the technical program by proposing new session topics or volunteering to lead or co-lead a session.

Important Dates:

- Conference Session Proposal Call: June 8, 2026
- Session Proposal Submission Deadline September 15, 2026
- Call for Abstracts: August 14, 2026
- Abstract Submission Deadline: December 4, 2026
- Abstract Acceptance Notifications: December 18, 2026
- Early-Bird Registration Opens: January 15, 2027
- Early Registration Period: January 16 – February 25, 2027
- Late Registration Begins: February 26, 2027

SNO conference summary 2025

2025 14th Next-generation Applications of Nanotechnology for Optimal sustainability (NANO) Conference

Jointly Organized by SNO & IWA (International Water Association)

TIME: November 07-09, 2025

LOCATION: Wyndham San Diego Bayside Hotel, San Diego, California, USA



The 14th SNO conference (2025) showcased the latest breakthroughs in nanoscale science and technology with a focus on sustainability. A total of 122 participants registered for the conference, representing academia, industry, and government sectors. Most attendees were affiliated with institutions in the United States, while 13 participants were identified from international institutions outside the U.S., including Canada (2), Japan (2), South Korea (2), Mexico (2), India (1), Denmark (1), Ireland (1), Israel (1), and Thailand (1). The participant group included professors, researchers, postdoctoral fellows, and students, highlighting the interdisciplinary and international nature of the conference.

There was a special tribute session for the Nanotechnology Enabled Water Treatment (NEWT) Center, celebrating its 10-year legacy of transformative contributions to sustainable nanotechnology. In addition, we had a discussion on Future of Metals-Organic Framework (MOF) in the Nano World, celebrating 2025 Nobel Prize. We are grateful for funding from the National Science Foundation ENG Nano Incentive Fund and the Environmental Sustainability and Nanoscale Interactions programs (Grant No. 2434177) for supporting student and travel awards.

Conference Organizing Committee

Conference Chairs: Xing Xie (Georgia Institute of Technology); Tonoy Das (Texas A&M University-Kingsville)

SNO President: Achintya Bezbaruah, North Dakota State University

SNO Executive Director: Deb Newberry, SNO

Plenary Speakers

Plenary I Dr. Qilin Li, Co-Director, NEWT Center, Rice University

Plenary II Emerging Investigator, Dr. Wenjie Xia, Associate Professor, Iowa State University

Plenary III Dr. Aydogan Ozcan, Associate Director-CNSI, UCLA

Plenary IV Dr. Joseph Wang, SAIC Endowed Chair, UCSD

Key Themes

Sources, Fate, and Effects of Nano/Microplastics
Nano Energy and Decarbonization
NanoEducation, Outreach, and Workforce Development
Safety and Sustainability of Nano-Based Applications
NanoBioeconomy: Agriculture, Energy, Food, and the Allied
AI and Machine Learning in Nanotechnology

NanoPolymers
Nanomedicine
NanoWaters
Tribute to NEWT

EMERGING INVESTIGATOR AWARDS: Dr. Wenjie Xia, Associate Professor, Iowa State University

STUDENT AWARDS

Nano Pitch Contest:

First: Kenneth Mensah (Penn State University, kjm7587@psu.edu)

Second: Feifei Liu (Georgia Tech, fliu337@gatech.edu)

Third: Cain Patel (Georgia Tech, cainpatel@gatech.edu)

Poster:

First: Joshua Quinn (jsquinn3@asu.edu, Arizona State University)

Second: Alex T Zhang (alextzhang@bernardsboe.com, Ridge High School)*

Third: Kenneth Mensah (Pennsylvania State University, kjm7587@psu.edu)

*High School Student



Sponsorship:  ROYAL SOCIETY
OF CHEMISTRY

SNO conference summary 2024

2024 13th SNO CONFERENCE PROGRAM OVERVIEW

TIME: November 08-10, 2024

LOCATION, Omni Providence Hotel, Providence, Rhode Island, USA

This year's SNO conference focused on fundamental nano-scale processes related to sustainability and the environment and presented current state-of-the-art knowledge and an outlook on nano-enabled applications. The conference brought together 91 participants from academia, state agencies, and federal organizations to exchange ideas, foster collaborations, and recognize outstanding contributions to the field of sustainable nanotechnology. The conference featured 58 oral presentations and 33 poster presentations, highlighting recent advances in sustainable nanotechnology, nanoplastics, environmental applications, and nanomedicine. A special tribute session was also held in honor of Prof. Robert Hurt recognizing his significant contributions and lasting impact on the sustainable nanotechnology community. We are grateful for funding from the National Science Foundation ENG Nano Incentive Fund and the Environmental Sustainability and Nanoscale Interactions programs (Grant No. 2434177) for supporting student travel awards.

Conference Organizing Committee

Conference Chair: Geoffrey Bothun, University of Rhode Island

SNO President: Achintya Bezbaruah, North Dakota State University

SNO Executive Director: Barbara Karn, SNO

Coordinator: Barbara "BJ" Carangia, University of Rhode Island

Sponsorship:



Plenary Speakers

- Plenary I Philip Demokritou, Rutgers University (SNO Lifetime Achievement Awardee, 2023) Sustainable Nanotechnology: Bio-inspired, nature-derived, and non-toxic nanomaterials for agri-food applications and beyond
- Plenary II Jay Vietas, Chief, Emerging Technologies Branch, NIOSH Nanotechnology Research Center (NTRC): 20 Years and Looking Ahead into the Future
- Plenary III Ines Zucker, Tel Aviv University (Emerging Investigator Awardee): Nanocomposites for Water Treatment: Are we on the right track?
- Plenary IV Reginald Rogers, University of Missouri: Responsible Development of Nanotechnology for Educating the Next Generation of Scientists and Engineers
- Plenary V Robert Hurt, Brown University: Enabling Nanotechnology Development through Research on Stability, Scaling, and Safety
- Plenary VI Sudipta Seal, University of Central Florida (SNO Lifetime Achievement Awardee, 2024): The journey of a Nano Rare Earth Oxide: From Metallurgy to Medicine
- Plenary VII Marissa Giroux, U.S. EPA Office of Research and Development: Nanoplastics Quantification & Ecological Effects: Challenges, Successes, and Future Directions
- Invited Talk Sara Mason, Group Leader, Theory and Computation, CFN BNL Center for Functional Nanomaterials

Concurrent Sessions:

- | | |
|---|--|
| • Nano for Energy, Infrastructure, and the Environment | • NanoMedicine |
| • Fate, Transport and Exposure | • NanoSustainability |
| • NanoBioeconomy: Agriculture, Energy, Food, and the Allied | • Emerging Research in Nanoplastics |
| • Nanotechnology Education, Industry and Workforce Open House | • Translating Nano EHS to Nanoplastics |
| • NanoPolymers | • Tribute to Robert Hurt |

SNO conference summary 2024

2024 13th SNO CONFERENCE PROGRAM OVERVIEW CONT'D

EMERGING INVESTIGATOR :

•Ines Zucker, Tel Aviv University

STUDENT TRAVELLING AWARDS: 35 recipients (covering nearly all applicants)

NANO PITCH CONTEST

NanoPitch 2024 Awardees

First: Yifei Ma, University of Pittsburgh, Pittsburgh, PA

Second (Joint): Ehsanur Rahman, University of Minnesota-Twin Cities, MN

Second (Joint): Pierre Bambier, École de technologie supérieure (ÉTS), Montreal, QB, Canada

Third: Ezequiel G. Locascio, Tecnológico de Monterrey, Monterrey, Mexico.

Students interview



Where are you now, and what are you currently working on?

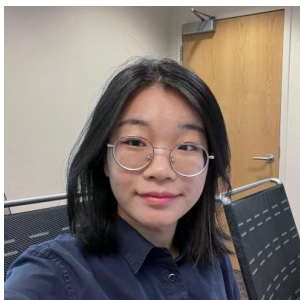
Kenneth Mensah: I am currently a PhD candidate in Civil and Environmental Engineering at Pennsylvania State University with Dr. Onur Apul. My research focuses on nanobubble-enabled interfaces and their applications in environmental engineering, particularly in water and wastewater treatment, advanced oxidation processes, resource recovery, and space life-support systems. More recently, I have been investigating the fundamental stability and interfacial behavior of nanobubbles under both terrestrial and near-space conditions, with the broader goal of designing more efficient and sustainable environmental technologies.

How did the SNO student award or participation in SNO contribute to your professional development and career journey?

Participating in SNO has been incredibly valuable because it brings together researchers from diverse disciplines who share a common interest in sustainable nanotechnology. The conference environment encouraged meaningful scientific discussions, networking, and collaboration across fields that do not always interact directly. Receiving recognition through the student competitions was especially encouraging and helped reinforce confidence in communicating interdisciplinary research to a broader audience. More importantly, SNO has provided a supportive community that values both scientific rigor and sustainability-driven innovation.

What excites you most about the future of sustainable nanotechnology research?

What excites me most is the growing realization that nanoscale phenomena can fundamentally reshape how we approach global sustainability challenges. Sustainable nanotechnology is moving beyond proof-of-concept studies toward scalable solutions for water treatment, environmental remediation, energy systems, circular resource recovery, and even space exploration. I am particularly excited by research that integrates fundamental interfacial science with real-world engineering applications. The field is becoming increasingly interdisciplinary, combining materials science, environmental engineering, biology, artificial intelligence, and systems design, which creates enormous potential for transformative innovation.



Where are you now, and what are you currently working on?

Feifei Liu: Now I am in Atlanta, Georgia and working in Georgia Tech with Dr. Xing Xie. My research focuses on the microscale-interdigitated electrodes induced electroporation for surficial bacterial inactivation.

How did the SNO student award or participation in SNO contribute to your professional development and career journey?

SNO is a warm family and embraces lots of possibilities. I feel everyone is so kind, and they are happy to talk and discuss with you. It gives me faith to work with people in such a warm environment. I worked as a grader during the poster session, and I feel I am a part of the organizer. It drives me to know about their study systematic too and I met some people who were doing research in different ways, like more engineering or more science part. Moreover, I am very happy to get the second place in the nano pitch competition. I am a comparative shy person, and English is not my native language. I do prepare a while for this competition, and my original goal is to challenge myself. So, I am very happy that I get the award which gave me confidence and positive feedback to my struggling.

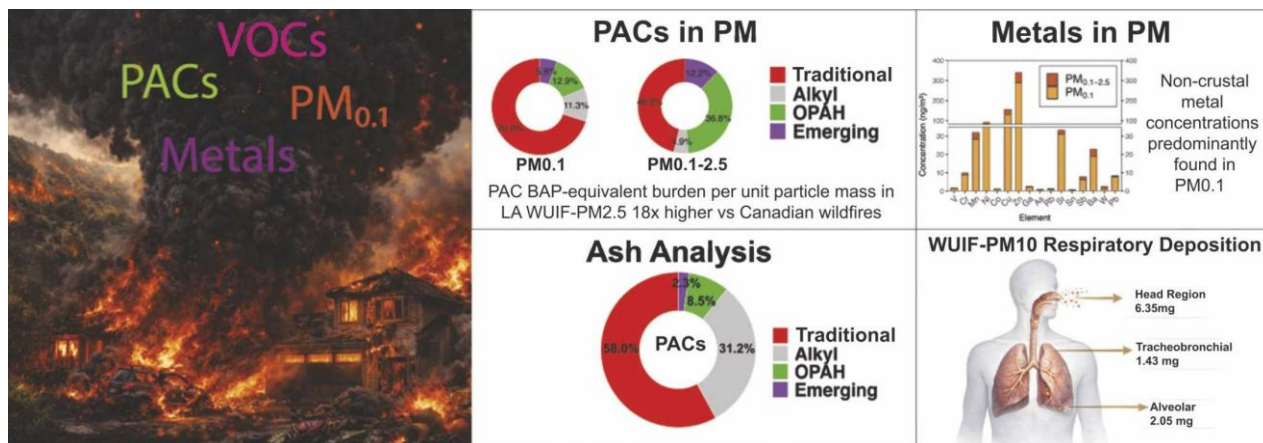
What excites you most about the future of sustainable nanotechnology research?

It reminds me of book of the *"The Three-Body Problem"* where they use nanomaterials to combat the organizations who want the humans on earth to be defeated by species that come from three bodies. That is the power of three body even though it could be a research result that can probably be published in nature. I still think we can explore a lot in the nano scale and probably one day there will be something that can get into another dimension of "trade off". Another thing I feel excited about is interdisciplinary research. Sometimes you feel it is so hard for you because you do not have the basic knowledge but another person in another field thinks it is just an easy task. The power of interdisciplinary research is strong, and I am also looking forward to chemistry, materials, biology in nanoscale.

Academia spotlight

Chemical complexity and enrichment in wildland–urban interface fire emissions: A case study of particulate matter, gas-phase pollutants, and ash from the 2025 Los Angeles fires

Cedeño-Laurent, J. G.; Calderón, L.; Tsiodra, I.; Pradeep, S.; Davey, H.; Rahmati, R.; Bazina, L.; Fu, X.; Batbaatar, N.; Tsai, C. S. J. Chemical Complexity and Enrichment in Wildland–Urban Interface Fire Emissions: A Case Study of Particulate Matter, Gas-Phase Pollutants, and Ash from the 2025 Los Angeles Fires. *J. Hazard. Mater.* 2026, 142357. <https://doi.org/10.1016/j.jhazmat.2026.142357>



Abstract: The Los Angeles (LA) wildland–urban interface (WUI) fires of January 2025, are among the most destructive natural disasters in U.S. history, generating complex emission profiles that remain insufficiently characterized. An intensive field sampling campaign was conducted during the active burn period to collect and characterize the complex physicochemical properties of size-segregated particulate matter (WUIF-PM), vapor-phase compounds (WUIF-VOC), and ash (WUIF ash). While regulatory air quality indices remained within moderate categories during the sampling period, chemical analyses revealed substantial enrichment of hazardous species relative to urban background and biomass-only wildfire conditions. Oxygenated and highly toxic polycyclic aromatic hydrocarbons (OPAHs) were found in ultrafine WUIF-PM_{0.1}, (size < 100 nm) and the fractional concentration (µg/g) of US EPA 16 priority polycyclic aromatic hydrocarbons (PAHs) in WUIF-PM_{2.5} exceeded recent levels for LA background, and biomass-only wildfires by an order of magnitude due to the excessive burn of human-made structures. Non-crustal metals were predominantly concentrated in WUIF-PM_{0.1} and consistently enriched relative to both LA background (up to ~30 ×) and biomass-only wildfire aerosols (10–1000 ×). Benzene, toluene, ethylbenzene, and xylene (BTEX) concentrations in WUIF-VOC air samples were 4.8–13-fold higher than background levels. More alarmingly, WUIF ash samples contained PAHs, metals, and per- and polyfluoroalkyl substances (PFAS) consistent with mixed combustion of structural materials and vegetation raising concerns for post-fire environmental health risks. These findings indicate that PM_{2.5} mass and criteria air pollutants alone may underestimate the toxicological burden of WUI smoke, and expanded physicochemical monitoring and characterization is needed to advance exposure assessment and health risk evaluation during complex WUI fire events.

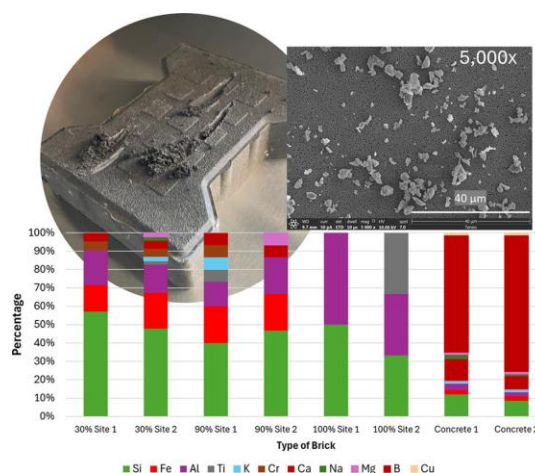
Evaluation of airborne exposures associated with grinding applications of plastic-sand composite bricks

Sridharan, S.; Nforsoh, S. N.; Oyanedel-Craver, J. S. V.; Tsai, C. S.-J. Evaluation of Airborne Exposures Associated with Grinding Applications of Plastic-Sand Composite Bricks. *J. Hazard. Mater.* 2026, 101175. <https://doi.org/10.1016/j.jhazadv.2026.101175>

Abstract: Construction bricks made from plastic waste present an emerging method of recycling plastics, but there is little documentation on the potential health risks associated with plastic waste bricks. To examine particle emission hazards, this study evaluated micro- and nano- sized particles emitted from plastic-sand composite bricks when operators are cutting or grinding them. We utilized three plastic-sand composite bricks which were composed from a mixture of high-density polyethylene (HDPE) waste plastics and sand in the following ratios, 30 % wasteplastic with 70 % sand, 90 % waste plastic with 10 % sand, and 100 % waste plastic. Common exposures were simulated by grinding plastic-sand composite bricks in an enclosure. The resulting particle emissions were as

Academia spotlight

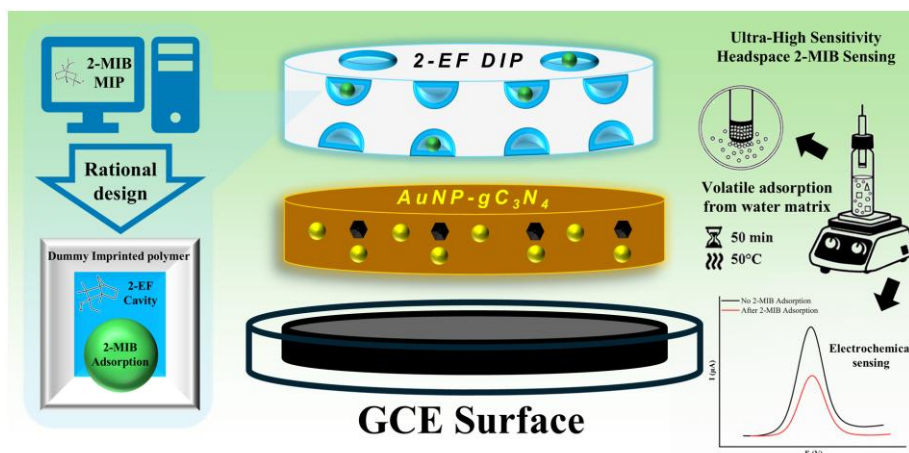
5.3×10^6 particles/cm³ in the 10–420 nm size range and 6100 particles/cm³ in the 0.3–10 μ m size range. Energy dispersive X-ray spectroscopy (EDX) analysis showed that brick particles contained various elements including Si, Al, Ti, and Cr. Exposure to these elements has been correlated with adverse health outcomes including carcinogenicity. The results suggest that brick grinding and cutting may migrate thousands to millions of ultrafine inhalable and respirable particles into the environment and the operator's breathing zone while performing tasks. The small size of nanoscale particles poses a higher potential for respirable particle hazard; these findings suggest adding appropriate controls when operators are utilizing plastic-sand composite bricks. Emitted particle characteristics may vary with different brick compositions, and nanoparticle occupational exposure limits do not exist yet; these limitations suggest taking caution in extrapolation and highlight the need for further research.



Rational design of a dummy-imprinted nanoplatform for ultrasensitive and leakage-free headspace-electrochemical detection of 2-MIB

Li, Z.; Tripathi, A.; Tian, Y.; Gao, J.; Zhou, J.; Xie, X. Rational Design of a Dummy-Imprinted Nanoplatform for Ultrasensitive and Leakage-Free Headspace-Electrochemical Detection of 2-MIB. *Environ. Sci. Nano* **2026**, *13* (5), 2350–2363. <https://doi.org/10.1039/d6en00099a>

Abstract: The accumulation of taste and odor (T&O) metabolites, particularly 2-methylisoborneol (2-MIB), poses persistent challenges to drinking water security. Conventional reliance on centralized chromatography creates logistical bottlenecks that impede real-time decision-making. Herein, we report an integrated headspace-electrochemical nanoplatform (IHEN) utilizing a high-fidelity “dummy” template strategy for rapid on-site detection. Guided by a multi-scale computational screening protocol involving topological similarity analysis and density functional theory (DFT) calculations, 2-ethylfenchol (2-EF) was rationally selected as a cost-effective, isostructural analog to create precise recognition cavities. This approach significantly enhances analytical fidelity by distinguishing signal responses from potential template residues, while the integrated headspace configuration ensures a physically leakage-free detection process that protects the original sample matrix from secondary contamination. The sensing interface integrates a dummy-imprinted polymer with a gold nanoparticle (AuNP) and graphitic carbon nitride (g-C₃N₄) nanocomposite scaffold, which synergistically amplifies electron transfer kinetics and vapor-phase capture efficiency. The resulting sensor achieves an ultralow limit of detection (LOD) of ~96 pg L⁻¹, far surpassing human sensory thresholds. Validated by excellent recovery in natural waters, this portable, cost-effective paradigm enables decentralized monitoring for the proactive management of T&O events in water treatment facilities.



WANTED: Good ideas for SNO Newsletter

SNO is your organization. If you have an idea you want to implement through SNO, including a workshop, a publication, an outreach activity, a new curriculum, or a different session, please let us know.

We are also warmly welcoming news, conference announcements, student/postdoc openings, job opportunities, and other member-related announcements.

Please do not hesitate to submit the news that you would like to share and other contribution to the SNO newsletter to the editor, Wen Ma or Kenneth Mensah:

wen.ma@usherbrooke.ca; kjm7587@psu.edu

Join us as a member

Become part of a vibrant and interdisciplinary community dedicated to advancing sustainable nanotechnology through research, education, and collaboration. SNO membership provides opportunities to connect with researchers from academia, industry, and government while staying informed about the latest developments in the field.

As an SNO member, you can enjoy a variety of benefits, including:

- ❖ *Discount on conference registration fees:*
 - \$250 discount for regular members
 - \$175 discount for student members
- ❖ *Three webinars for members only:*
 - September-for students – how to best position yourself for the job you want
 - November – Artificial Intelligence and nanotechnology
 - January - Nanoplastics
- ❖ *SNO newsletter:*
 - All you want to know about SNO's activities
- ❖ *Membership in a community of like-minded scholars:*
 - About 200 researchers specializing in sustainable nanotechnology
- ❖ *Opportunities to share*
 - job openings, conference announcements, and other community news through the SNO website and newsletter.
- ❖ *Professional development and leadership opportunities,*
 - Particularly for students and early-career researchers, through conference activities, volunteer committees, and society initiatives.

To become a member, please visit susnano.org/membership-form.html.