



SNO REPORT

**Sustainable
Nanotechnology
Organization**

VOLUME 7, ISSUE 1

APRIL 2018

Research | Education | Responsibility

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Please send news, conference announcements, job postings, and other contributions to the SNO Report to SNO@susnano.org

Newsletter Editorial Board

Dr. Sanghamitra Majumdar

University of California Santa Barbara

Dr. Nirupam Aich

University of Buffalo, The State University of New York.

Dr. Illya A. Medina

University of Texas El Paso

Looking Ahead: Sadik Stepping Down as SNO's President



This edition of SNO brings highlights of events from the 2017 annual conference held in Los Angeles in November as well as important changes in the organization. As the inaugural President and Co-Founder of SNO, I will be stepping down in November this year. I plan to continue serv-

ing on the Advisory Board as co-founder to take SNO to the next level. The SNO Board has approved the election of Dr. Vinka Craver as the next SNO President. Prof. Vinka Oyanedel-Craver (University of Rhode Island, USA) is an Associate Professor in the Department of Civil and Environmental Engineering at the University of Rhode Island. Her current research interests are in the areas of drinking water, wastewater and stormwater treatment. Recently she is focusing on Environmental Nanotechnology: specifically, on the behavior of nanoparticles in different environmental compartments and their use as antimicrobial compounds at point of use water treatment in rural developing communities. Dr. Oyanedel-Craver has served on the SNO Board as the Secretary and has represented SNO at the USA Science and Engineering Festival.

I would like to thank all those that have served SNO as volunteers working behind the scene to help realize the creation of this new and growing organization. These include my co-founder Dr. Barbara Karn, as well as others on the Advisory Board, poster organizers, nanopitch organizers, SNO Newsletter editors, past conference chairs, session chairs, and, in fact, all volunteers, too many to mention. SNO was founded in 2011 as a result of discussions at the inaugural Gordon Research Conference (GRC) on Environmental Nanotechnology which was held at Waterville, Valley, NH. In 2012, the first SNO conference was held in Arlington, Virginia, in response to a follow-up survey conducted after the GRC meeting. I have overseen the creation of the organization along with Dr. Barbara Karn, together setting the vision for the organization to fulfil its mission of providing neutral platforms where scientists, engineers, and other professionals can exchange information and ideas for the development and responsible application of nanotechnology that would lead to overall sustainability.

Under my leadership as President and co-founder of SNO, the organization is building support for science, promoting the understanding of its wider relevance to society, with transformative effect on sustainable nanotechnology. In just 6 years of existence, SNO has organized six annual conferences that have brought together over 2,000 nanotechnology practitioners at various venues within the US and around the world. SNO workshops have been targeted towards specific topics of relevant interests and have produced three workshop reports on thematic subjects. SNO has recognized lead-

ers in the field of nanotechnology through the SNO awards and has engaged the young and upcoming groups of students, postdocs and other young investigators through its travel grants, poster awards, Nanopitch competitions, and Emerging Investigator awards. SNO has broadened its appeal to the wider community through its participation in the USA Science & Engineering Festival since 2013. Through this program, it has presented short activities and hands-on activities related to sustainable nanotechnologies and has also presented a workshop on "Communicating Nanostuff." The organization has partnered with other organizations such as the Royal Society of Chemistry and the American Chemical Society to produce special journal issues. SNO has reached across the continents by working with partners in Europe and Asia. I have no plans to ease up on SNO activities in the coming years. We plan to continue enhancing the SNO brand through Trademarks, seeking foundation grants, and building international charters and sub-sections.

We are also working on the 2018 annual conference. The seventh annual conference will be held at the Hilton Alexandria Old Town from November 8-10, 2018, in Alexandria, Virginia. Don't forget to take advantage of the low rates for hotel registration and conference rates by visiting www.susnano.org. Again as this edition of SNO is highlighting events from the last annual conference, I congratulate the 2017 SNO awardee: Professor Paul Westerhoff of Arizona State University (ASU) and the SNO/RSC Young Investigator Awardee, Dr. Perreault, also of ASU. The Best Poster awardees were Douglas Rice (first place), Dema Almasri (Second place), and Zachary Shephard, (Third place). The 2017 nanopitch winners were Douglas Rice, Zachary Shephard and Natalie Gonzalez. The interview with Dr. Jorge Gardea-Torresdey, Dudley Professor of Environmental Science and Chemistry at UTEP underscored the importance of sustainability using environmentally-friendly nano-enabled products. Young investigators will be encouraged to read the interview with Dr. Sujung (Candace) Tsai on her involvement with SNO and career plans.

This edition of SNO Report contains other exciting news. Enjoy!

Sincerely,

Wunmi Sadik, PhD
SNO President & Co-Founder

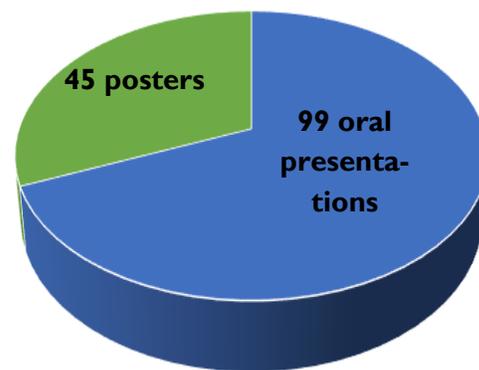
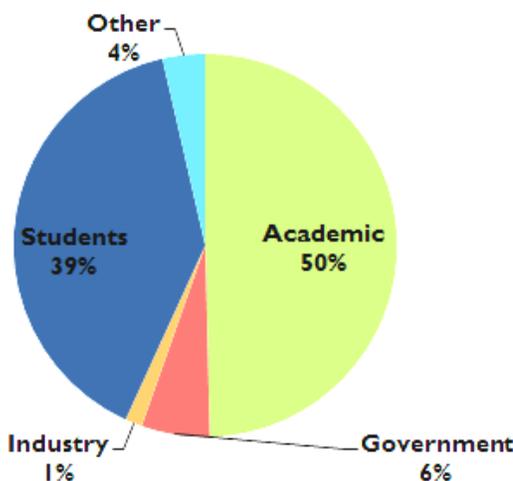
**HIGHLIGHTS FROM SNO CONFERENCE 2017
LOS ANGELES, CALIFORNIA**



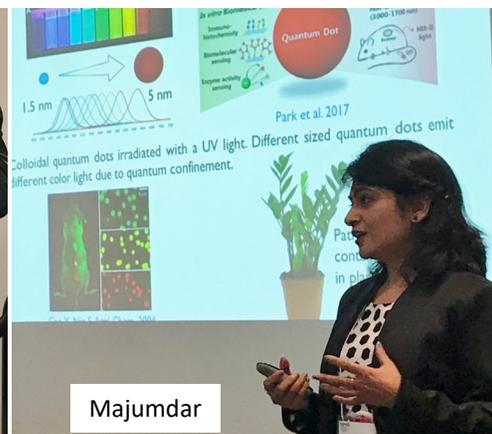
The 6th SNO conference was organized by Dr. Jorge Gardea-Torresdey (Conference Chair), Dr. Arturo Keller (Conference Co-Chair), Dr. Wunmi Sadik (SNO President and Co-founder), and Dr. Barbara Karn (SNO Executive Director and Co-founder) in Los Angeles, California, from November 5-7, 2017. 137 researchers and administrators from industry, government and academic institutions including students, post-docs and professors attended the conference sharing their exemplary work on sustainable nanotechnology.

The sessions covered a wide range of topics

- Tribute to Pedro Alvarez
- Food /Agriculture
- Water
- Exposure
- Nanotoxicology
- Life cycle
- Sensors/M Measurement
- Green synthesis
- Education/Social aspects
- Nanomedicine



Karn, Alvarez, Sadik, Keller, Gardea-Torresdey



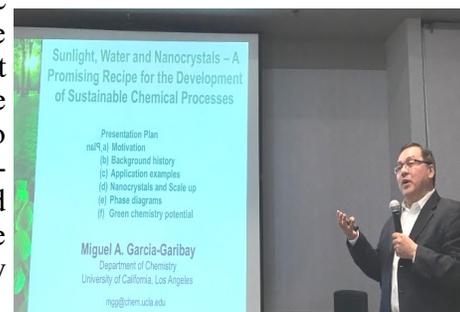
Majumdar

2017 SNO PLENARY SPEAKERS

Dr. Pedro J. J. Alvarez is the George R. Brown Professor of Civil and Environmental Engineering at Rice University, where he also serves as Director of the NSF ERC on Nanotechnology-Enabled Water Treatment (NEWT). His research interests include environmental applications and implications of nanotechnology, bioremediation of toxic chemicals, water footprint of biofuels, water treatment and reuse, and antibiotic resistance control. Dr. Alvarez currently serves on the advisory board of NSF Engineering Directorate and as Associate Editor of *Environmental Science and Technology*. As a tribute to his exemplary contribution to the field of sustainable nanotechnology research on how engineered nanomaterials interact with bacteria, elucidating their mode of action and discerning potential impacts to microbial ecosystem services, an oral session was chaired by Dr. Jorge Gardea-Torresdey in which 12 researchers presenting their contribution to sustainable nanotechnology. Dr. Alvarez in his plenary speech discussed the vision for next generation water treatment technologies using nanomaterials.



Dr. Miguel A. Garcia-Garibay is a professor in the department of chemistry and biochemistry at the University of California Los Angeles (UCLA) and currently the Dean of Physical Sciences in the UCLA College. Garcia-Garibay has achieved international reputation for his work in solid-state organic chemistry, solid state reaction mechanisms, dynamics in crystals, and crystalline molecular machines. His current research efforts are aimed at the development of chemical process that occur in the solid state with great efficiency under the effects solar energy, without harmful additives, and with no solvents. He also works on the development of fluids for application in solar-thermal energy capture and on the design and construction of collective amphidynamic crystals and molecular machines. Dr. Garcia-Garibay in his plenary speech discussed the use of nanocrystal and sunlight to perform water chemistry for sustainable energy and environmental applications.



Dr. Seth Coe-Sullivan is VP and Chief Technology Officer of Luminitt LLC, where his team is currently introducing new products involving transparent holographic components and computer-generated holography and collaborating with the US government on a variety of longer term research projects. Before joining Luminitt, Seth was co-founder, member of the Board of Directors, and Chief Technology Officer of QD Vision, winner of the 2014 Presidential Green Chemistry Award and which was recently acquired by Samsung. Dr. Coe-Sullivan in his plenary speech discussed how nanomaterials have revolutionized lighting technology and evolution of holographic systems.

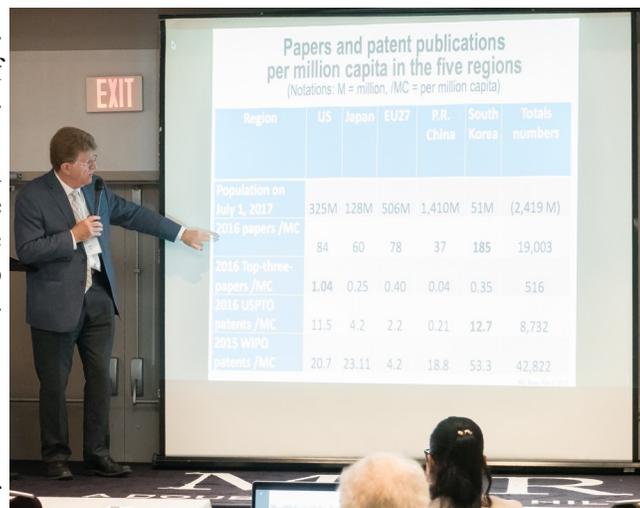


Dr. Charles Geraci is the Associate Director for Nanotechnology and Advanced Materials at the National Institute for Occupational Safety and Health (NIOSH). He provides overall strategic guidance to the Nanotechnology Research Center which focuses on understand the potential human health implications of engineered nano and advanced materials; and developing effective strategies to manage any recognized risk. Dr. Geraci in his speech discussed directions and strategies which will be helpful to determine the risks of emerging advanced materials and also for their safer-by-design synthesis and application.



2017 SNO PLENARY SPEAKERS Continued..

Dr. Mihail Roco is the Senior Advisor for Science and Engineering at the National Science Foundation and founding chair of the U.S. National Science and Technology Council's subcommittee on Nanoscale Science, Engineering and Technology (NSET). He proposed the National Nanotechnology Initiative (NNI) on March 11, 1999, at the White House and is a key architect of the NNI. Dr. Roco in his plenary speech gave a broad overview of the state-of-the-art nanotechnology innovations and research and also discussed the path forward towards the convergence of technologies.



Dr. Omowunmi "Wunmi" Sadik is a Professor of Chemistry and founding Director of the Center for Research in Advanced sensing Technologies and Environmental Sustainability (CREATES) at the State University of New York at Binghamton (SUNY Binghamton). Sadik serves as the President and Co-Founder of the Sustainable Nanotechnology Organization (SNO). Her research areas are in surface chemistry, chemical sensors and biosensors, and in their application to solving real-life problems in biological systems, energy and the environment. Dr. Sadik in her plenary speech discussed about the birth and growth of SNO as a strong organization advocating for sustainable and safer design of nanotechnology and nano-materials for diverse applications.



Dr. Joseph Wang is a Distinguished Professor, SAIC Endowed Professor and Chair of Nanoengineering at University of California San Diego (UCSD), USA. After holding a Regents Professor and Manasse Chair positions at NMSU, he moved to ASU where he served as the Director of the Center for Bioelectronics and Biosensors (Biodesign Institute). The research interests of Dr. Wang include the development of nanomotors and nanoactuators, bioelectronics and biosensors, wearable sensor systems, and flexible materials. Dr. Wang in his plenary speech discussed the design and application of novel nanomotors for environmental sensing applications.



HIGHLIGHTS FROM SNO CONFERENCE 2017

LOS ANGELES, CALIFORNIA

2017 SNO Award

Dr. Paul Westerhoff
Arizona State University



The SNO Award is given annually to a top contributor in the field of sustainable nanotechnology. **Dr. Paul Westerhoff** was honored with the 2017 SNO award for his contributions to sustainability research aimed at advances in water treatment and improving water quality and safety through nanotechnology solutions. He is the Vice Dean for Research and Innovation at The Ira A. Fulton Schools of Engineering, ASU. Dr. Westerhoff is currently the deputy director of the NSF Nanosystems Engineering Research Center for Nanotechnology Enabled Water Treatment where he conducts research using the novel properties of nanomaterials such as optical and selective binding to

purify water.

2017 SNO/RSC Emerging Investigator Award

The SNO/Royal Society of Chemistry Emerging Investigator Award is given annually to a top (untenured) scientist working in sustainable nanotechnology.

Dr. Francois Perreault has been contributing greatly in the understanding of the cellular interactions of nanomaterials for sustainable designing of antimicrobial surfaces, and use of graphene nanomaterials in membrane based water treatment. We look forward to seeing his future contributions and accomplishments.

Dr. Francois Perreault

Arizona State University
(ASU)



Honorary Award

Dr. Vicky Grassian, Executive Associate Dean, distinguished chair of physical chemistry and distinguished professor in the Department of Chemistry and Biochemistry, University of California San Diego was honored for her exemplary contribution as the founding Editor-in-Chief of the journal *Environmental Science: Nano* which was started in 2013 to encourage research on sustainable designing of nanomaterials to address environmental and human health concerns. *Environmental Science: Nano* has served as SNO's official journal for the past three years.



Grassian with Sam Keltie, RSC

HIGHLIGHTS FROM SNO CONFERENCE 2017 LOS ANGELES, CALIFORNIA

2017 SNO Student Travel Award

In 2017 conference, SNO recognized 19 students including undergraduates and graduates from US Institutions with travel awards based on their motivation, experience and advancement in sustainability research which encourages them to participate and present their interesting ongoing research projects amongst the stalwarts in the field of sustainable nanotechnology.



Student travel awardees with Dr. Barbara Karn and Dr. Wunmi Sadik

2017 Awardees:

Ana Barrios, Arizona State University

James Dillon, SUNY Polytechnic Institute

Isabel Foreman-Ortiz, University of Wisconsin- Madison

Michael Giannetto, Yale University

Huiyuan Guo, University of Massachusetts, Amherst

Leigh Hamlet, University of Massachusetts, Amherst

Junyeol Kim, University of Notre Dame

Elizabeth Laudadio, University of Wisconsin-Madison

Roland Miller, SUNY Binghamton

Tashfia Mohona, University at Buffalo, The State University of New York

Fabiola Moreno Olivas, Binghamton University

Douglas Rice, Arizona State University

Runsheng Song, University of California Santa Barbara

Ying Wang, University of California Santa Barbara

Meng Wang, University of California, Los Angeles

Tianxi Yang, University of Massachusetts, Amherst

Jing Zhang, Binghamton University

Jessica Couture, University of California Santa Barbara

Mark Falinski, Yale University

HIGHLIGHTS FROM SNO CONFERENCE 2017

LOS ANGELES, CALIFORNIA

Best Student Poster Awards

First prize. Douglas Rice, Arizona State University

Developing anti-fouling reverse osmosis feed spacers to improve performance of reverse osmosis modules

Second Prize. Dema Almasri, University of Texas at Austin, Adsorption of phosphate on iron oxide modified halloysite nanotubes

Third prize. Zachary Shepard, Assumption College. Environmental Application of Nano Zero Valent Iron (NZVI) Conjugated with 2D MoS₂ Nanosheets



Nanopitch Winners

In 2017 Nanopitch contest, organized by Dr. Achintya Bezbaruah, students from different universities participated to pitch their research project to a distinguished panel of judges in 100 seconds. And the winners were:

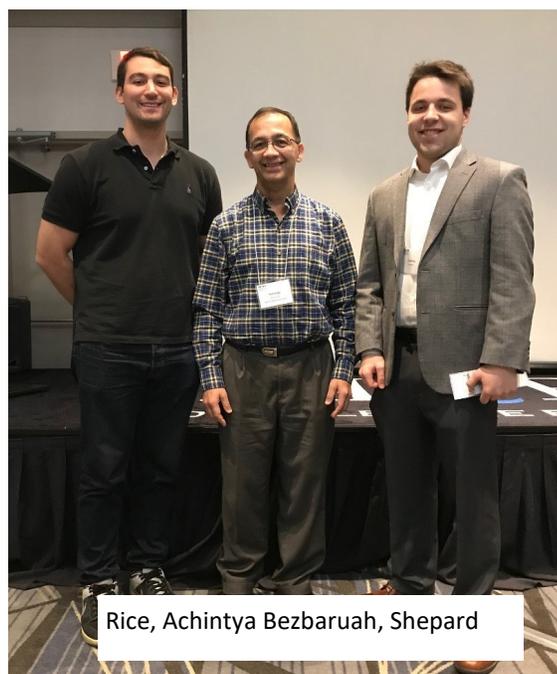
First prize **Douglas Rice**,
Arizona State University

Second prize **Zachary Shepard**,
Assumption College

Third prize **Natalie Gonzalez**,
University of California
San Diego



Sadik, Almasri, Shepard, Gonzalez, Rice, Candace Tsai



Rice, Achintya Bezbaruah, Shepard

RESEARCH HIGHLIGHTS

Dr. Jorge Gardea-Torresdey



**Dr. Jorge
Gardea-Torresdey**

is the Dudley Professor of Environmental Science & Engineering and Professor of Chemistry at The University of Texas at El Paso (UTEP).

He is currently the Chair of the Department of Chemistry at UTEP.

He has authored over 420 publications and has been issued 5 US patents for environmental remediation.

Dr. Gardea has graduated 35 Ph.D. Students and 29 students have received their M.Sc. degrees under his mentorship. Also, he has mentored more than 35 undergraduate students in research.

<https://www.utep.edu/science/gardea/>

jgardea@utep.edu

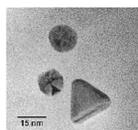
“Our research in environmental nanotechnology promotes sustainability because we are trying to protect the environment by investigating the potential toxicological effects of nanomaterials”

Dr. Gardea considers that by using nanotechnology to help mankind, it is possible to produce environmentally friendly nano-enabled products. For example, to ensure that we are drinking clean water. Also by enhancing agricultural yield through the use of nanofertilizers we can ensure that food demand is satisfied.

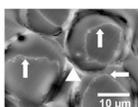
“We are looking to protect the environment and all its organisms by investigating the potential positive or negative effects of different nanomaterials.”

Dr. Gardea’s visions his future research in applications of nanotechnology for enhancing agriculture, fighting drought, and providing accessible and affordable clean water.

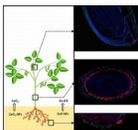
Dr. Gardea’s research articles in the sustainable nanotechnology



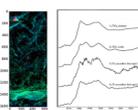
Gardea-Torresdey, J. L., et al. "Formation and growth of Au nanoparticles inside live alfalfa plants." *Nano letters* 2.4 (2002): 397-401.



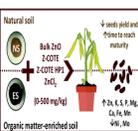
Priester, John H., et al. "Soybean susceptibility to manufactured nanomaterials with evidence for food quality and soil fertility interruption." *Proceedings of the National Academy of Sciences* 109.37 (2012): E2451-E2456. <https://doi.org/10.1073/pnas.1205431109>



Hernandez-Viezcas, Jose A., et al. "In situ synchrotron X-ray fluorescence mapping and speciation of CeO₂ and ZnO nanoparticles in soil cultivated soybean (Glycine max)." *ACS nano* 7.2 (2013): 1415-1423.



Servin, Alia D., et al. "Synchrotron verification of TiO₂ accumulation in cucumber fruit: a possible pathway of TiO₂ nanoparticle transfer from soil into the food chain." *Environmental science & technology* 47.20 (2013): 11592-11598. <https://doi.org/10.1021/es403368j>



Medina-Velo, Illya A., et al. "Nutritional quality of bean seeds harvested from plants grown in different soils amended with coated and uncoated zinc oxide nanomaterials." *Environmental Science: Nano* 4.12 (2017): 2336-2347. <https://doi.org/10.1039/C7EN00495H>

SNO BOARD MEMBER Q & A

Dr. Su-Jung (Candace) Tsai



Welcome to our Young Researcher Q&A section, where we talk one on one with young faculty members and learn from them about their motivation, passion, challenges and direction in sustainable nano-research. In this issue, Dr. Nirupam Aich, Assistant Professor at University of Buffalo, SUNY interviewed Dr. Su-Jung (Candace) Tsai, Assistant professor at Colorado State University to discuss how SNO involvement aided in her career plans and her plans in addressing occupational exposure concerns in nano-EHS.

(Aich) What drew you to SNO? Why did you think SNO's work was important?

(Tsai) I have actually been involved with SNO from the very beginning as a member of the board. During that time (in 2011-2012), I was at University of Massachusetts Lowell and was involved in and co-Chair of the 5th International Symposium on Nanotechnology, Occupational and Environmental Health. Barbara Karn was also present at that meeting in 2011 and approached me with the invitation to be part of the first organizing board of SNO. Barbara planned to include occupational hazard of nanomaterials as one of the major themes for SNO, an area of my expertise, environmental health and safety (EHS), where I could really have an impactful contribution.

From my graduate studies in industrial and occupational hazards, I am quite aware of the importance of sustainability via cleaner production and ensuring occupational safety. I believe that nanomanufacturing and related industries will need to understand occupational hazards from nanomaterials. SNO is a strong proponent of Nano-EHS in occupational settings and thus, SNO's work in this area is quite im-

portant.

(Aich) Can you please tell us in details about your research and explain how your research in the environmental health implications of nanoparticles is related to gaining insights on sustainable nanotechnology?

(Tsai) Thanks for the question. I have had a multidisciplinary journey from my undergraduate to graduate studies along with an industrial job in between, and these experiences have shaped my research interests around the major pillars of Sustainable Nanotechnology and Nanomanufacturing. I received my undergraduate degree in Chemical Engineering and then MS in Chemical (Biomaterial) Engineering in 1995 when I performed research related to drug delivery and established my interest in human health. My several years of experience working on-site at plants as an engineer for a big corporation gave me a strong motivation to protect employees and workers. I came back to School and obtained another master's degree in Business School and my doctorate in Cleaner Production and Occupational Hygiene from University of Massachusetts, Lowell. During my doctoral study back in early 2000, I started nano-EHS research in occu-

pational exposure, engineering control and related risks pertaining the use of engineered nanomaterials in various settings.

My research is focusing on the assessment of nanomaterial exposure through mostly airborne and inhalation pathways. My goal is to be able to eliminate the exposure through identification of the exposed sources and controls of exposure. If there is no exposure, there won't be concerns to human health. From manufacturing through the lifecycle of nanomaterials to the end of product use, there are many ways consumers and workers could get exposed to nanomaterials. My research aims to understand how and to what extent the inhalation exposure of nanomaterials happens and also the changes in the physico-chemical properties of the exposed nanomaterials based on the product itself or by the methods of processing or usage.

(Continued on Page 10)

SNO BOARD MEMBER Q & A

Dr. Su-Jung (Candace) Tsai Continued..

Continued (Tsai) One of the major areas is to develop better nanoparticle exposure assessment methods through improved collection/sampling of nano-aerosols. Now my research is looking at a different approach for nano-aerosol collection which relies simultaneously on number count and chemical analysis for the exposure assessment in addition to the gravimetric measurement. This provides a unique ability to measure and detect airborne nanoparticles at any possible environment and at very low concentration. Through this patented technology, we can know both the quantity and identity of the airborne nanoparticles and get a more accurate assessment of their environmental or occupational exposure.

(Aich) Many companies/industries are moving away from utilization of nanomaterials. This is delaying the commercialization of nanomaterials and nano-enabled products. How do you think SNO can play a role in overcoming this difficulty?

(Tsai) I don't think that the companies or industries are moving away from utilization of nanomaterials. However, they are possibly moving away from the claims of using nanotechnology/nanomaterials. This has probably been caused by the definition of nanomaterials and cautions of the potential risk raised in numbers of publications and research results coming out in the nano-EHS or nano-Risk area. The companies are using so-called 'advanced materials' lately which are essentially different hierarchical versions of nanomaterials. However, the overlap of nanomaterials and advanced materials was not clearly identified and companies themselves don't want to be labelled with risks associated with nanomaterials.

I believe that SNO can start communicating with such industries and should claim that the advanced materials and nanotechnology enabled materials both benefit the technology development and our society. Any form of nanomaterials, whatever they are constituted in products, should be included in the discussion for SNO. That will expand our industry collaboration and better management of sustainable nanomanufacturing.

(Aich) Your work is related to occupational health of workers in the nanomaterial industry. Can you comment on the epidemiological studies that have been done so far and the needs for similar research?

(Tsai) We published a review on the epidemiological studies on nanomaterial exposure in 2016, we found only a few (5-6) studies. The difference between then and now is not much. Epidemiological studies are critical for developing the decision rule in terms of the effect on human health. For example, if regulatory decision regarding the carcinogenicity classification of a material or chemical is needed to be made, when *in vitro* and animal studies alone won't suffice. Epidemiological studies

need to be performed to confirm that the substance is associated with the human case. However, in Europe few countries take precautionary steps and can impose exposure limits on substances just based on animal studies.

(Aich) How can SNO help to build the next generation of nanoscientists?

(Tsai) This is really a topic that has been discussed in the SNO board. Universities and departments are varying in their opinions about nano-education and sustainability. A rather sad thing is that nanotechnology has never been identified yet as a separate industry unlike biological/biomedical industry. The academics would really have to reach out to the industry and decide how to train better the students and make ready for them with concepts about sustainable nanotechnology.



We have recently partnered with the Center for Nanotechnology and Nanotoxicology at Harvard University to provide our member access to the "Nanolecture Series". SNO member will be able to register for the webinar or access to the recorded lectures from their website. The upcoming lecture is:

May 24th. Rapid In Vivo Assessment of the Nano/Bio Interference to Help Develop Safer Nanomaterials. Robert Tanguay, Professor of Environmental and Molecular Toxicology, Oregon State University.

SNO ANNOUNCEMENTS

SNO CONFERENCE 2018

Mark your calendars for “**The 7th Sustainable Nanotechnology Organization Conference 2018**” held from November 8-10 in **Alexandria, VA**. Deadline for abstract submission is **August 17**. The deadline for student awards is **August 17**.

Young investigators are invited to apply for SNO Emerging Investigator by September 16.

Do not forget to register before **September 15** to avoid late fees. More details on sessions and organizers can be found online at <http://www.susnano.org/SNO2018/conference-overview-2018.html>.

Renew your SNO membership early and enjoy benefits !!

Location

**Hilton Alexandria Old
Town 11767 King Street,
Alexandria, Virginia-22314,
USA**



Deadline for reservations to get SNO rate at the hotel: Sunday, October 7, 2018
Please click [here](#) to get conference rates. Conference rate is \$189/night.

UPCOMING EVENTS



SNO members, Drs. Cristina Sabliov and David W. Britt are chairing the 2018 Nanoscale Science and Engineering for Agriculture and Food Systems to be held on **June 3 - 8, 2018**. Applications for this meeting must be submitted by May 6, 2018.



The 9th International Conference on Nanotoxicology will take place from **18 - 21 September 2018** in Neuss, Germany. More details on sessions and organizers can be found online at www.nanotox2018.org.

The 19th International Conference on Heavy Metals in the Environment to be held from **July 21-25, 2018** in Athens, Georgia, is hosting a session “*Analysis of Nanoparticulates and Colloidal Metals Using Advanced ICP-MS Techniques*”. Please find more details at <https://ichmet2018usa.org/>.



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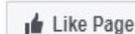
SNO is an organization for all things “sustainable nanotechnology.” Social media is a great way to stay up-to-date on the latest topics and remained connected to our members. We use Twitter and Facebook to post news relevant to SNO and to stay engaged with our members. **Please follow us @susnanotech.** Publish a paper? Obtain a new research grant? Give a lecture on sustainable nano? We would love to hear from you!



Support the development of sustainable nanotechnology for the improvement of society, the...



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SNO's purpose is to provide a professional society forum to advance knowledge in all aspects of sustainable nanotechnology.

susnano.org

Joined September 2013

22 Photos and videos

