

# SNO letter

NEWSLETTER OF THE SUSTAINABLE NANOTECHNOLOGY ORGANIZATION



**Sustainable  
Nanotechnology  
Organization**

Research | Education | Responsibility

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### SNO Newsletter Submissions

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The next newsletter will be released in October 2015.

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## SNO Enters its 4<sup>th</sup> year of Dynamic Growth

If I were asked to take a stock of the achievements that SNO has enjoyed during the past year, I would first note that the list is long and growing.

In November 2014 we held our 3<sup>rd</sup> annual conference in Boston with over 220 participants in attendance. Seven eminent scientists, engineers, and leaders of sustainable nanotechnology gave plenary talks. We grew our industrial membership by 23% and added dozens of new members. Industrial participants were drawn from different sectors, including energy/defense, industrial hygiene/health risk management, product safety, and the health sciences sectors. Others included professionals charged with testing, inspection, legal, education, and green chemistry. Conference participants came from almost all states of the United States, as well as international participants. About 45% of participants were students, and this was indicative of the “recentness” of the field.



Earlier this year, we held the SUN-SNO-GUIDENANO Sustainable Nanotechnology Conference from 9 -11 March 2015 in Venice, Italy. The conference was jointly organized by SNO and two large EU FP7 nanosafety projects known as the [Sustainable Nanotechnologies \(SUN\) project](#) and [GUIDENANO](#). This forum provided a perspective on the implications and applications of nanotechnology by leading experts in EU and USA, as well as fostered new multi-sector collaborations in nanotechnology. Of the nearly 160 attendees, ~20% were from the US while others came from Russia, Italy, Israel, Denmark, France, Germany, Canada, UK, Spain, Austria, Poland and Turkey.

Also this year, we participated again in the Sustainability Expo in Washington, DC. as part of our outreach to potential graduate students in the K-12 range. We are now close to the production of our 4<sup>th</sup> “Special Issue” contributions to two ACS and RSC journals, including 9 newsletters. Besides all of these, we held a mini SNO meeting at the 2015 Gordon Research Conferences on Environmental Nanotechnology June 21 - 26, 2015 in West Dover, VT., and at the NSTI Nanotech meeting.

All these are a lot, but there is still a lot more to come as we get bigger and better. We are facilitating some potential research projects and workshops. The 4<sup>th</sup> SNO conference will be held at the Benson Hotel, Portland, Oregon November 8 - 10, 2015. The conference co-chairs are **Dr. Greg Lowry** (a Professor of Civil and Environmental Engineering at Carnegie Mellon University) and **Dr. Paul Tratnyek** (a Professor at the Oregon Health and Science University in the Institute of Environmental Health, Division of Environmental and Biomolecular Systems). This year's conference sessions will be organized around selected

"systems", e.g. air-water systems. There will be sessions on applications, effects and implications, analytical methods, and lifecycle aspects of nanomaterials within each system. The conference committee is putting together an outstanding technical program; please visit [www.susnano.org](http://www.susnano.org) for details. Don't miss important deadlines for SNO 2015; abstracts must be in by the end of August 2015. This is an important deadline both for student awards and conference abstracts. Early conference registration deadline is October 2, the deadline for hotel registration for conference rates is October 16, and late registration begins after October 3 until November 4, 2015.

SNO will also hold its 5th workshop that will focus on the Application of Sustainable Nanotechnology to Optimize and Unify Food, Energy and Water Systems. This workshop is sponsored by the National Science Foundation and SNO, and will be co-chaired by Drs. Greg Lowry and Jason White; Chief Analytical Chemist, CT Agricultural Experiment Station (CAES), Monday, October 19 - Tuesday, October 20, 2015 at Carnegie Mellon University, Pittsburgh, PA. This pioneering workshop will bring together leading scientists and engineers from many research fields comprising the FEW nexus. The aim is "to identify the most promising opportunities for nanotechnologies to improve overall agroecosystem performance, and to identify the scientific and engineering challenges currently inhibiting widespread applications of nanotechnology in food production."

In looking ahead, SNO is delighted to partner with the Congress of Nanotoxicology, which will take place in Boston in 2016. SNO has the convening power to bring people together. The congress will have access to the organization's diverse membership, including leaders in the field, early faculty career investigators, postdoctoral fellows, students, and industrial members.

We are continuing to grow and continuing to get better! SNO is very unique in its mission of focusing on a very new technology and its relationship to sustainability. No other organization has this combination of science and values. SNO is your organization. Let us all work toward its sustainable future through research, education, and responsibility.

*Wunmi Sadik*  
*SNO President*

In this *Issue*, our feature Q&A is **Dr. Jean-Yves Bottero**, Director of CEREGE in France, SNO happenings over the past few months, news related to the upcoming Portland meeting, and SNO related announcements.

## SNO is Holding a Membership Drive

While almost 200 researchers attend the SNO conferences, SNO has been lax on getting members outside the conference time. We hope to remedy this with our current push for membership. If you join now before **September 15**, you will get a lower conference fee than if you wait until after that date. Membership is good for one year and will give price breaks on other SNO activities. It's also tax deductible! Go to <http://susnano.org/membership.html>.



## SNO Q &amp; A SESSION

**DR. JEAN-YVES BOTTERO**

Director, [CEREGE, European Geosciences and Environment Lab](#)

**(Doudrick) How do you define sustainable nanotechnology?**

**(Bottero)** Sustainable nanotechnology can be defined using two concepts, safer by process and safer by design. Safer by process has been in practice and developing for many years in order to protect people working in nanomanufacturing companies using measures such as masks, gloves, and detectors. Safer by design concerns manipulation of nanomaterials and products containing nanomaterials in order to have a minimal negative impact. It means that the product is conceived from a very good knowledge of the nanomaterial's chemistry, morphology, size, surface coatings, etc., which allows design of the product to limit the production of harmful effects during and after the product life. This also requires a good knowledge of the life cycle of the products, expected quantities, probable exposure routes and product uses (paints, plastic composite, clothes, agro-food, etc.).

**(Doudrick) What is Europe's current approach for regulating nanomaterials in consumer products?**

**(Bottero)** Regulation in Europe is somewhat complex because some countries such as France, Belgium, and Denmark have their own approaches, which makes it difficult to define broad EU regulations. But, Europe has various programs such as NanoREG 1 and 2, SUN, MARINA, NanoMILE, and ProSAFE that all contribute to regulation. [NaNoREG](#) is a common European approach for regulatory testing of manufactured nanomaterials. It has three main objectives:

- 1. Providing legislators with a set of tools for risk assessment and decision making instruments for the short to medium term, by gathering data and performing pilot risk assessment, including exposure monitoring and control, for a selected number of nanomaterials used in products.*
- 2. Developing for the long term, new testing strategies adapted to a high number of nanomaterials where many factors can affect their environmental and health impact.*
- 3. Establishing a close collaboration among authorities and industry with regard to the knowledge required for appropriate risk management, and create the basis for common approaches, mutually acceptable datasets and risk management practices.*

[SUN](#), or SUsustainable Nanotechnologies, relies on the idea that if we can use our current knowledge of nanomaterials and an integrated approach to addressing the complete product lifecycle in order to guide nanomanufacturing. [NanoMILE](#), or Engineered nanomaterial mechanisms of interactions with living systems and the environment: a universal framework for safe nanotechnology, is in place to establish a fundamental understanding of the mechanisms of nanomaterial interactions with living systems and the environment, across the entire life cycle of nanomaterials and in a wide range of target species in order to implement safer by design manufacturing. [MARINA](#), or managing risks of nanomaterials, focuses on the integrated and intelligent testing, integrated assessment, and modular interconnection of knowledge and information for developing validated science-based risk management methods. [ProSAFE](#), or Product Safety Forum of Europe, is currently preparing a White Paper aimed at creating a broad-based platform of support between all levels of government, regulators, legislators, scientists, and

## SNO Q &amp; A SESSION

industry, in order to provide nano-safe products and services. This must also be accepted by the US and other non-EU players, and the program will allow us to work closely with US entities such as NSF and SNO as well as various research centers such as CEINT, UC-CEIN, and LC-Nano.

**(Doudrick) What area of study related to sustainable nanotechnology do you think is currently the most pressing?**

**(Bottero)** I think the agro-food sector is currently the most problematic. For example, there is no good approach for evaluating the benefit/risk of agro-food products containing nanomaterials, whether it be in the food or in the packing. We need to understand the transformation of nanomaterials during the aging of these products as well as the biological effects after humans and animals are exposed.

I also think that potential product areas that will use a large quantity of nanomaterials and be prevalent in the world are important. For example, self-cleaning cements and indoor/outdoor paints or stains, both having the potential to be present in all new and retrofitted buildings. We must first understand their life cycle completely and study these materials under real conditions. There is a current knowledge base, particularly in Switzerland with outdoor paints and France (CEREGE and SERENADE project) with cements and paints, but there are still a lot of unknowns, especially for products that may have a large impact on human health and the environment.

**(Doudrick) Can you briefly explain the SUN-SNO collaboration and ways those in the US can get involved with European counterparts? When is the next relevant meeting in Europe?**

**(Bottero)** The SUN-NANO collaboration brings together two like-minded organizations in the US and Europe. As discussed previously, projects such as ProSAFE are a great way to get parties involved from both countries. I will be in Portland in November for the SNO meeting and Washington DC in December for the EU/US meeting, both of these will be great opportunities to start some of these conversations. Although the project locations and times are unknown right now, we also welcome US scientists to MARINA and SUN meetings, as well as collaboration through SERENADE, which is a project that started in 2012 and ends in 2020. Please do not hesitate to send me an email ([bottero@cerege.fr](mailto:bottero@cerege.fr)) if you are interested in getting involved.



Sustainable Nanotechnologies Project



CENTRE EUROPEEN DE RECHERCHE ET D'ENSEIGNEMENT  
DE GÉOSCIENCES DE L'ENVIRONNEMENT

## UPCOMING SNO MEETING IN PORTLAND

**SNO Promotes A Systems Approach For Its Conference**

For its conference this year, SNO is trying a new approach to sustainable nanotechnology. This new approach involves looking at sustainable nanotechnology as systems and the interaction of those systems. Arguably, a major part of sustainability is climate change resulting from greenhouse gas emissions produced by anthropogenic energy systems. Therefore, energy systems comprise one of the sessions at the 2015 SNO conference. Examples of how nanotechnology research fits in with making energy more environmentally benign and sustainable include Energy storage; generation by solar, wind and salinity gradients; energy transmission; CO2 capture and storage; processing efficiency improvements; more efficient lighting, use of nanotechnology to improve biofuels, etc. In addition, implications the materials used in energy could fit into this session. For example, research into exposure limitation of some toxics used in nano material energy applications would be appropriate.

Food and water systems are also very important in sustainability. The food system session might include research on precision agriculture; pesticide delivery, nutrient delivery, improved food packaging and preservation; food fortification; stabilizing soil; human health and the environmental implications of all these. Water systems include both drinking water and wastewater. Nanotechnology is an important application in both these areas and any risks involved in using nano materials in water must be examined and mitigated.

Other systems of importance to sustainable nanotechnology are covered by sessions on industrial/manufacturing, solid waste management, environmental systems, medical systems, education systems, urban systems, and social systems. A major goal of this new approach is to make researchers aware of where their nanotechnology research fits into the bigger picture of sustainability. We also expect some synergies and creative interactions among researchers in the various areas. Sustainable nanotechnology lends itself to interdisciplinary tea, and we hope to promote this with our new approach in the 2015 SNO conference.



## UPCOMING SNO MEETING IN PORTLAND

**SNO Emerging Investigator Award**

The SNO Emerging Investigator designation gives recognition to emerging scientists and engineers working in the area of sustainable nanotechnology. In recognition of this designation, a certificate and a \$1500 prize will be presented at the 2015 SNO Conference.

Criteria and eligibility include:

- Investigators who are within the first 10 years post Ph.D.
- An impactful body of independent work and publications in the area of sustainable nanotechnology: environmental, societal, or economic.
- Attendance at the 2015 SNO Conference in Portland, Oregon November 8<sup>th</sup> - 10<sup>th</sup> 2015 (<http://www.susnano.org/SNO2015/conferenceOverview2015.html>)
- A high quality paper submission to ES: Nano within one year after receiving the award.

The nomination consists of a single (1-page max) nomination letter, a second (1-page max) support letter and a 2-page CV (self-nominations are not accepted). The nomination letter should describe how the nominee's research impacts the field of sustainable nanotechnology. The support letter should focus on the nominee's teaching, service and leadership in the field of sustainable nanotechnology. Both the nomination and support letters can be made by SNO members and *Environmental Science: Nano* Editorial and Advisory Board members. Nominations are not restricted to the US or UK.

Letters and CV are due to *Environmental Science: Nano* Editor-in-Chief Vicki H. Grassian ([vicki-grassian@uiowa.edu](mailto:vicki-grassian@uiowa.edu)) by **September 15, 2015**.

The selected Emerging Investigator will be honored at the SNO Awards dinner on Sunday November 8, 2015.

**Portland Pitch!**

It is time to get ready for the Nano Pitch Contest 2015 in the SNO Conference at Portland (OR). Students will be able register for the contest on-site in Portland. Each participant will be given 100 seconds (don't forget nano!) to present her/his work using one slide (without animation). Three cash prizes will be awarded. Contestants will be judge by a panel of experts. Given the enthusiasm of the participants in Boston and popularity of the contest, more participants are expected in the Portland Conference.



## SNO HAPPENINGS

**Virginia Tech students man SNO booth at EPA EXPO**

On April 11 and 12, Chang Liu, Haoran Wei, James Dale, and Marina Vance from Virginia Tech "manned" the SNO exhibit at EPA's National Sustainable Design Expo in Alexandria, VA. The SNO booth showed products containing nanomaterials and provided demonstrations of nanotechnology's unique properties such as water-proofing fabrics and improving building materials. The Expo featured student P3 projects which included several using nanotechnology. SNO is continuing its outreach projects by informing the public at events such as this and last year's Science and Technology Expo in Washington DC.

**Wunmi and Barb Visit English Nano Centers**

Many SNO members will recall completing a survey on priorities for sustainable nanotechnology developed by SNO member and PhD candidate Marco Cinelli. Marco is almost finished with his research and invited SNO president, Wunmi Sadik, and Executive Director, Barbara Karn to hear his preliminary results, present their own work, promote SNO, and learn what nanotechnology researchers are working on at the University of Warwick. The Warwick group, led by Dr. Kerry Kirwan, focuses on nanocomposites and has an impressive array of manufacturing tools. Tony McNally, Dr. Chaoying Wan and Professor Stefan Bon presented innovative work on nano-enabled structures and materials. We look forward to the final results from Marco's work. Wunmi and Barb also visited the REACH Center at the University of Lancaster which focuses on chemicals management and includes nanomaterials in its purview. The Reach Center was one of the partners in the SUN-SNO-Guidenano conference in March in Venice.



...and not trip to England would be complete without a castle!

## ANNOUNCEMENTS

**SNO holds Mini-SNO Meeting**

The Environmental Nanotechnology Gordon Research Conference is like Las Vegas—what goes on there stays there. However, we feel we can report that there was a mini-SNO meeting at the Conference. Surprisingly, many of the attendees did not know about SNO, so it was an opportunity to explain our purpose and activities. We hope to see some new faces as a result.

**Look for the SNO special issue**

Papers from the 2014 SNO Conference in Boston will be featured in a special issue of *Environmental Science: Nano*, SNO's official journal, in partnership with the Royal Society of Chemistry. Conference co-chairs, Jackie Isaacs and Phil Demokritou, plus SNO leaders Wunmi Sadik and Barbara Karn will be guest editors. Invitations to submit were sent to the best papers presented at the conference. Over 40 articles are expected for this issue. In addition, plenary speakers will give their insights on what they think about sustainable nanotechnology. Currently, issues of *ES: Nano* are available online by registering at <http://pubs.rsc.org/en/journals/journalissues/en#!recentarticles&all>.

**Annual SNO Meeting**  
**Portland, OR**  
**November 8-10, 2015**

**November 7 Workshop on Informatics**  
**Pre-SNO meeting**

**International Congress on Nanotoxicology**  
**June 1-4, 2016**

**WANTED: Good ideas for SNO**

SNO is your organization. If you have an idea you want to implement through SNO—a workshop, a publication, an outreach activity, a new curriculum, a different session, etc.—please let us know. We are always open to great new ideas.

We also welcome members to **post ads** including news, student/postdoc openings, job opportunities, and other member related announcements. ([info@susnano.org](mailto:info@susnano.org))

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**[www.susnano.org](http://www.susnano.org)**