

Sixth Sustainable Nanotechnology  
Organization Conference 2017  
Sunday, Nov. 5 – Tuesday, Nov. 7  
Los Angeles, California

# Nano Education Session

## November 5, 2017



Sustainable  
Nanotechnology  
Organization

Research | Education | Responsibility

# Nano Education for a Global World

J Nanopart Res (2013) 15:1946  
DOI 10.1007/s11051-013-1946-1

PERSPECTIVES

**The new world of discovery, invention, and innovation:  
convergence of knowledge, technology, and society**

Mihail C. Roco · William S. Bainbridge

DE GRUYTER

DOI 10.1515/ntrev-2013-0039 — Nanotechnol Rev 2014; 3(2): 211–221

Nanotechnology education

Ineke Malsch\*

**Nano-education from a European perspective:  
nano-training for non-R&D jobs**

**NTSE**



**Nano-Tech Science Education**

This work is funded by the European Commission, education and training:  
LLP Transversal Programme KA3-ICT through Project 511787-LLP-1-2010-1-TR-KA3-KA3MP



Lifelong Learning  
Programme



**SLINTEC**  
SRI LANKA INSTITUTE OF NANOTECHNOLOGY (PVT) LTD.

# Nano Education Literature

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NANO FOCUS

### Integrating Nanoscience into the Classroom: Perspectives on Nanoscience Education Projects

Andrew Greenberg\*

Nanoscale Science and Engineering Center, Institute for Chemical Education, and Department of Chemistry, University of Wisconsin-Madison, Madison, Wisconsin 53706

**ABSTRACT** The National Nanotechnology Initiative has motivated substantial growth in nanoscience and nanotechnology research in the United States and beyond. One of the central

central missions of the NNI is to "develop and sustain educational resources, a skilled workforce, and the supporting infrastruc-

ACS NANO

www.acsnano.org

## Nanotechnology Education for the Global World: Training the Leaders of Tomorrow

Joshua A. Jackman,<sup>†</sup> Dong-Joon Cho,<sup>‡</sup> Jaywon Lee,<sup>§</sup> Jia Ming Chen,<sup>||</sup> Flemming Besenbacher,<sup>+</sup>  
Dawn A. Bonnell,<sup>#</sup> Mark C. Hersam,<sup>||</sup> Paul S. Weiss,<sup>\*,||,▲,▽</sup> and Nam-Joon Cho<sup>\*,†,▽</sup>



# Sustainable Nano Education Building Blocks

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Online Resources

**NISE**  
NATIONAL INFORMAL  
STEM EDUCATION  
NETWORK



Nano Education  
Modules



Modules  
developed at  
ERCs and  
materials  
research  
centers

Nano Education  
Activities

NanoDays



Nano-labs,  
problem-based  
learning



# Nano Education Future

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- A Nano Education Journal
- Nanotechnology certificates
- Nanotechnology vocational training programs
- Nanotechnology-centered degrees
- The role of SUS Nano at the interface of nanoscience and environmental engineering and science



# Leadership from SUS Nano Community

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## PERSPECTIVES

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<b>Nanotechnology</b>	<b>Natural sciences</b>	<b>Governance/management skills</b>	<b>Practical skills</b>
Nanoparticles in waste	Natural science education	Legal background	Media training
New areas such as grapheme, third/ fourth generation nanomaterials	Safety	Regulation	Communication
Nanorisk assessment	Exposure mechanisms	Management of chemicals	
Nanotoxicology	Sustainable production	Environmental diplomacy	
Nanomaterials	Physical properties	Management	
Nanoscience	Physics/mathematics equations	Risk communication	
Legal and social aspects of nanotechnology	Climate change	Science policy	
Nanotechnology for journalists	Genetically modified organisms (GMOs)		
	Synthetic biology		



# 2A: Education Session-I

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## 2A Education II

- |                                                                                                                                   |                    |
|-----------------------------------------------------------------------------------------------------------------------------------|--------------------|
| 1:00 Introduction                                                                                                                 | Navid Saleh        |
| 1:10 Nanoeducation On Many Levels: Case Studies Spanning Informal Science Education to Undergraduate Research to Graduate Studies | Vicki Grassian     |
| 1:40 A Nano-Enabled Water Treatment Laboratory To Teach Earth Sciences And Chemistry Through Nanotechnology                       | Francois Perreault |
| 2:00 Nano Tools Course at the University of Rhode Island                                                                          | Vinka Craver       |
| 2:20 Managing Expectations for Graduate Students Involved in Nano-Related Sustainability Research                                 | David Jassby       |
| 2:40 Vault Nanoparticles for Water Treatment: Experimental and Educational Approaches                                             | Meng Wang          |

3:00 Break



# 2B: Education Session-II

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## 2B Education II

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|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| 3:30 Increasing the Reach of Nanotechnology and Sustainability Content in Multiple Educational Environments                                     | Deb Newberry              |
| 3:50 Nanomaterials and the Safer-By-Design approach for the next generation: Economic and regulation issues with the case of Amipaint.          | Camille de Garidel-Thoron |
| 4:10 Gauging Public Perceptions on the Economic and Ethical Implications of Food Nanotechnology                                                 | Yajuan Lu                 |
| 4:30 Sustainable Nanotechnology as a Platform for Interdisciplinary and Holistic Graduate Education                                             | Matthew Chan              |
| 4:50 Case Study on Nano-education Course Development: Sustainable Material Applications and Reuse in Treatment (SMART) of Water and Environment | Indranil Chowdhury        |
| 5:10 PARMA NANO-DAY: an International school for young researchers in “nano”                                                                    | Elena Maestri             |
| 5:30 An Active Learning Based Theory and Laboratory Course for Nano Education                                                                   | Navid B. Saleh            |

