

*Program*

***Nanotechnology Convergence for  
Sustainable Energy, Environment,  
Climate Change and Health:  
A US-Africa Conference***

July 14-18, 2024

Casablanca, Morocco

Conference Chairs:

Isabel Escobar, University of Kentucky  
Ahmed El-Gendy, University of Texas-El Paso



Engineering  
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**Engineering Conferences International**

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**The conference organizers gratefully acknowledge support from the U.S. National Science Foundation.**



## **Sunday, July 14, 2024**

- 17:00 – 18:00            Conference check-in (Câpre Room)
- 18:00 – 19:15            Opening and Welcome  
Isabel Escobar and Ahmed El-Gendy, Conference co-chairs

### **Plenary #1**

#### **Overview of the NSF ENG/CBET Division: Core programs and convergence research opportunities**

Nora Savage, National Science Foundation, USA

- 19:15 – 21:15            Reception and Dinner

### **NOTES**

- *Technical and Poster Sessions will be in the Anis & Basilic rooms on the ground floor of the hotel.*
- *The ECI Office is across from the meeting room in Origan & Capre.*
- *Breakfasts and lunches will be in the Bab Restaurant.*
- *Audiotaping, videotaping and photography of presentations are prohibited.*
- *Speakers – Please have your presentation loaded onto the conference computer prior to the session start (preferably the day before).*
- *Speakers – Please leave at least 3 minutes for questions*
- *Please do not smoke at any conference functions.*
- *Turn your cellular telephones to vibrate or off during technical sessions.*

**Monday, July 15, 2024**

07:00 – 09:00 Breakfast Buffet

09:00 – 10:00 **Plenary #2**  
**Selective membranes for ion recovery and fractionation of pharmaceutical components**  
Suzana Nunes, KAUST, Saudi Arabia

10:00 – 10:30 Coffee Break

10:30 – 12:00 **Session 1: Nano-Environment – Coatings and Manufacturing**  
Session Chair: Maria Coleman, University of Toledo, USA

**Oral107s1 - Fabrication of polymeric membranes with silver nanoparticles and eco-friendly solvents for biofouling reduction in water filtration**  
David Lu, University of Kentucky, USA

**Oral121s1 - Antimicrobial potential of nanocrystalline cellulose quaternary ammonium coatings**  
Christa Hestekin, University of Arkansas, USA

**Oral112s - Manufacturing of loose-nanofiltration polymeric membranes with eco-friendly solvents for water purification on an R2R system**  
Kwangjun Jung, Georgia Institute of Technology, USA

**Oral132s1 - Opportunities and challenges in complex particles**  
Martin Thuo, North Carolina State University, USA

12:00 – 13:30 Lunch

13:30 – 14:30 **Session 2: Nano-Energy**  
Session Chair: Kaitlyn Crawford, University of Central Florida, USA

**Oral102s1 - Nanoscale topological structure a non-equilibrium dynamics in functional materials**  
Edwin Fohitung, Rensselaer Polytechnic Institute, USA

**Oral108s1 - Thin film nanophotonics for clean energy applications**  
Mohamed El Kabbash, University of Arizona, USA

**Oral127s1 - A sustainable approach in energy application using clay-based membranes**  
Mohamad Roxy Islam, University of Central Florida, USA

14:30 – 15:00 Coffee Break

15:00 – 16:00 **Plenary #3**  
**The U.S. 21st Century Nanotechnology Research and Development Act at 21**  
Branden Brough, Director, NNCO, USA

16:45 – 19:00 Poster Session / Social Hour

Dinner on your own

**Tuesday, July 16, 2024**

07:00 – 08:45 Breakfast Buffet

09:00 – 10:00

**Plenary #4**

**Oral109s1 - Nanoparticles and multifunctional membranes for environmental remediation**

Dibakar Bhattacharyya, University of Kentucky, USA

10:00 – 10:30

Coffee Break

10:30 – 12:00

**Session 3: Nano-Environmental Applications**

Session Chair: Christa Hestekin, University of Arkansas, USA

**Oral137s1 - Sulfated nanocellulose coatings for enhanced agronomic benefits and environmental sustainability in wheat and quinoa cultivation**

Mohamed Jaouahar, Mohammed VI Polytechnic University, Morocco

**Oral125s1 - Delamination mitigation of modified bilayer membranes using a single slot die roll-to-roll manufacturing process**

Minwoo Jung, Georgia Institute of Technology, USA

**Oral134s1 - Sustainable additive manufacturing of polysulfone membranes for liquid separations**

Brian Leonard, West Virginia University, USA

**Oral114s1 - Effects of wet exfoliation strategies on the yield and colloidal behavior of 2D hexagonal boron nitride nanosheets**

Anika Azme, University of Nebraska – Lincoln, USA

12:00 – 13:30

Lunch

13:30 – 15:00

**Session 4: Nano-Medicine**

Session Chair: Peter Vikesland, Virginia Technical University, USA

**Oral106s1 - Smart nanomagnets for hyperthermia cancer therapy: in vitro and in vivo studies for breast, prostate tumor models**

Mariam Elabbasi, University of Texas at El Paso, USA

**Oral110s1 - Magnetically responsive biocompatible micromotors activated by light for targeted cell therapy**

Taiwo Sogbesan, FAMU-FSU College of Engineering, USA

**Oral122s1 - Nano(particles) to Treat Big (fat)**

MD Nurunnabi, University of Texas at El Paso, USA

**Oral130s1 - Nanoplastics: Emerging health effects and addressing knowledge gaps in their formation and remediation**

Kaitlyn Crawford, University of Central Florida, USA

15:30 - 16:00

Coffee Break



**Tuesday, July 16, 2024 (continued)**

16:00 – 17:00

**Session 5: Agriculture and Health**

Session Chair: Mohamed Jaouahar, Mohammed VI Polytechnic University, Morocco

**Oral124s1 - Addressing sustainability goals using nanobiotechnology enabled sensing**

Peter Vikesland, Virginia Technical University, USA

**Oral138s1 - Inactivation of Aerosolized Microbes using Chemically Immobilized Silver Nanoparticles on Air Filtration Membranes**

Isabel C. Escobar, University of Kentucky, USA

**Oral136s1 - Multifunctional phosphate-based bioplastics for sustainable environment, agriculture and energy**

Houssine Sehaqui, Mohammed VI Polytechnic University, Morocco.

**Virtual - Oral128s1 - Adaxial and abaxial leaf surfaces afford different nanocarrier foliar uptake pathways and nanofertilizer efficiency**

Gregory Lowry, Carnegie Mellon University, USA

17:00 – 17:15

Stretch Break

17:15 – 18:15

**Plenary #5**

**Leveraging nanotechnology applications to address climate change**

Jacob Jones, North Carolina State University and Director, Science and Technologies for Phosphorus Sustainability (STEPS) Center, USA

18:15 – 20:00

Poster Session / Social Hour

Dinner on your own

**Wednesday, July 17, 2024**

- 07:00 – 08:45 Breakfast Buffet
- 09:00 – 10:00 **Session 6: Sustainable Nanotechnology**  
Session Chair: Abdoulaye Ndao, University of California San Diego, USA
- Oral118s1 - Sustainable bimetallic nanocatalysts for electrochemical detection and degradation of 1, 4-dioxane in water and wastewater**  
Omowunmi Sadik, New Jersey Institute of Technology, USA
- Oral120s1 - Nanocellulose membranes for sustainable engineering**  
Jamie Hestekin, University of Arkansas, USA
- Virtual - Nanosciences & Nanotechnologies towards SDGs & Science with social impact**  
Malik Maaza, University of South Africa, South Africa
- 10:00 – 10:30 Coffee Break
- 10:30 – 11:30 **Session 7: Nano-Metrology**  
Session Chair: Jamie Hestekin, University of Arkansas, USA
- Oral101s1 - Symmetry and topology in photonics nanostructures**  
Abdoulaye Ndao, University of California San Diego, USA
- Oral111s1 - Leveraging nanoparticles for modeling viral vector recovery by membranes**  
Mara Leach, University of Kentucky, USA
- Oral139s1 - The Hidden Power of Nanomagnets in Industry and Medicine**  
Ahmed El-Gendy, University of Texas at El Paso, USA
- 11:30 – 12:00 Stretch Break
- 12:00 – 13:00 **Panel**  
**Bridging Divides: Connecting Nanotechnology Environmental, Health and Safety (EHS) Communities of Research (CORs) Across Regions**  
Moderator: Quinn Spadola (Deputy Director, NNCO)  
Panelists: Christof Asbach (Department Head (IUTA), Exposure COR Co-chair)  
Olga Tsyusko-Unrine (University of Kentucky, Ecotoxicity COR Co-chair)  
Mark Wiesner (Duke University, Risk Assessment COR Co-chair)
- 13:30 – 14:30 Lunch
- 14:30 Depart for Excursion (**Meet in hotel lobby no later than 14:25**)  
Guided tour of Casablanca will include visit to Hassan II Mosque.
- 19:30 Conference Dinner

**Thursday, July 18, 2024**

07:00 – 08:45 Breakfast Buffet

09:00 – 10:00

**Session 8: Nano-catalysis and Contaminant Barriers**

Session Chair: Dibakar Bhattacharyya, University of Kentucky, USA

**Oral123s1 - Efficacy of zero-valent iron (f0) particles and photocatalytic nanoparticles in removal of complex polar contaminants from water systems**

Hamidreza Sharifan, University of Texas at El Paso, USA

**Oral129s1 - Functional polymers composites for gas separations membrane and barrier applications**

Maria Coleman, University of Toledo, USA

**Oral135s1 - Assessing stability and toxicity of the polymeric membranes with phosphorene and their potential for removal of per-and polyfluoroalkyl substances**

Olga Tsyusko, University of Kentucky, USA

## Poster Presentations

<b><u>POSTER</u></b>	<b><u>TITLE</u></b>
1	<b>Leveraging nanoparticles for modeling viral vector recovery by membranes</b> Mara Leach, University of Kentucky, United States of America
2	<b>Harnessing Cellulose Nanofibers for Sustainable Water Filtration and Soil Remediation: A Nanotechnology Approach</b> Ke'Shan Lighty, North Carolina A&T State University, United States of America
3	<b>Chemical &amp; Physical characterization of Plastic Breakdown: accelerated oxidation of formulated polyethylene plastic</b> Aicha EL kharraf, University of Rennes, Duke university, France
4	<b>Exploring new and existing materials for development of phosphorus sensors.</b> Quintino Medi, Clemson University, STEPS, United States of America
5	<b>Characterization of polystyrene response in <i>Saccharomyces Cerevisiae</i></b> Kwaniyah Tuffour, UNCG & NCAT - Joint School of Nanoscience and Nanoengineering, United States of America
6	<b>Transcriptional Response of <i>Candida albicans</i> to Silica Nanoparticles</b> Zelena Johnson, University of North Carolina at Greensboro, United States of America
7	<b>Enhancing Phosphorus Degradation Efficiency with Nano-Enhanced Electrospun Fibers and Metallic Coatings</b> Sharika Cochran, NCAT - JSNN, United States of America
8	<b>Innovative Technologies for food, energy, and water nexus sustainability</b> Shawn Adams, UNC-Greensboro, United States of America