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
Casablanca Marriott Hotel
100, Avenue des Far
Casablanca 20000
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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 Fohtung, 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
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<td>Leveraging nanoparticles for modeling viral vector recovery by membranes</td>
<td>Mara Leach, University of Kentucky, United States of America</td>
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<td>Ke'Shan Lighty, North Carolina A&amp;T State University, United States of America</td>
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<td>Chemical &amp; Physical characterization of Plastic Breakdown: accelerated oxidation of formulated polyethylene plastic</td>
<td>Aicha EL kharraf, University of Rennes, Duke university, France</td>
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<td>Kwaniyah Tuffour, UNCG &amp; NCAT - Joint School of Nanoscience and Nanoengineering, United States of America</td>
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<td>Sharika Cochran, NCAT - JSNN, United States of America</td>
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<td>Innovative Technologies for food, energy, and water nexus sustainability</td>
<td>Shawn Adams, UNC-Greensboro, United States of America</td>
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<td>Magnetically Responsive Biocompatible Micromotors Activated by Light for Targeted Cell Therapy</td>
<td>Taiwo Sogbesan, FAMU-FSU College of Engineering, n/a, United States of America</td>
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