



2013
NanoTechnology
for Defense Conference

Conference
AGENDA

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DRIVING THE 21ST CENTURY MATERIALS REVOLUTION

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Vital Security Reminders

NT4D is ITAR Restricted & Military Critical

As a registered attendee of this Conference, you have a personal responsibility to help protect the data exchanged at this event. This includes responsibly managing your electronic devices (phones, computers, cameras, tablets, etc.), as well as your conversations. Please follow these basic guides at NT4D:

- Be aware of your surroundings when having technical conversations. All ITAR & Military Critical discussions should be held in the conference ballrooms or meeting space.
- All devices should be turned off (not on silent or vibrate) in the meeting space and exhibit hall. We understand it's important to stay connected, so please be prepared to step into the foyer to check messages and make phone calls.
 - The exception to this rule are computers or tablets used to take notes. Before entering the meeting space, you must turn off your wireless capability, cameras, recording functions, or microphones.
- If using a phone or having a conversation with someone in the general vicinity of the conference area, be mindful of other people or devices that could pick up or transmit your conversation or those conversations going on around you.
- Cameras are strictly prohibited. If you would like a photo of a booth, poster, speaker, or item within the confines of the conference space, see the NT4D photographer at the registration desk.
- NT4D Conference badges must be worn at all times when attending conference functions. You will not be admitted into the conference without it. Do not leave your badge unattended in your room. Keep it on your person or lock it in your room safe if not wearing it. If you lose or find a conference badge, please see the registration desk immediately.
- Do not leave the program agenda, conference notes, anything ITAR Restricted or Military Critical lying in the open. Keep it with you or lock it in your safe. Please turn into the registration desk any notes or agendas you find lying around.
- If you see or hear anything that concerns you, please err on the side of caution and report it. Ask for the conference coordinator, Michelle Williams, at the registration desk.

Thank you for your vigilance and awareness!

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NT4D Planning Team

Industry Sponsors

Thank you to our Industry Sponsors!

Lockheed Martin
The Boeing Company

Conference Technical Advisors

Dr. Rick Beyer, Army Research Laboratory
Dr. John Busbee, Xerion Materials Corporation
Dr. Anthony Esposito, Defense Threat Reduction Agency
Dr. Eric Snow, Office of Naval Research
Dr. Richard Vaia, Air Force Research Laboratory

Steering Committee

Dr. Wade Adams, Rice University
Dr. Chagaan Baatar, Office of Naval Research
Dr. Charles Cornwell, Army Engineer Research and Development Center
Mr. John Herold, Raytheon Missile Systems
Dr. Mike Meador, NASA Glenn Research Center
Dr. James Murday, University of Southern California
Dr. Revell Phillips, Defense Threat Reduction Agency
Dr. Edward Silverman, Northrop Grumman Corporation
Dr. Edwin Thomas, Rice University
Dr. Brian Valentine, Department of Energy
Lt Col Dan Wattendorf, Defense Advanced Research Projects Agency
Mr. Steve Yahata, Boeing Research & Technology

Technical Programming Committee

Dr. Paul Allison, Army Engineer Research and Development Center
Dr. John Beatty, Army Research Laboratory
Dr. Jeffrey Depriest, Defense Threat Reduction Agency
Dr. Bryce Devine, Army Engineer Research and Development Center

Technical Programming Committee, cntd.

- Mr. Kelly Dodds, Raytheon
- Dr. Eric Forsythe, Army Research Laboratory
- Dr. Josh Hagan, Air Force Research Laboratory
- Dr. Jacob Jordan, Defense Advanced Research Projects Agency
- Dr. Raouf Loutfy, MER Corporation
- Dr. Charles Marsh, Army Engineer Research and Development Center
- Dr. Benji Maruyama, Air Force Research Laboratory
- Dr. Heather Meeks, Defense Threat Reduction Agency
- Dr. Randy Mrozek, Army Research Laboratory
- Dr. Josh Orlicki, Army Research Laboratory
- Ms. Laura Rae, Air Force Research Laboratory
- Dr. Adam Rawlett, Army Research Laboratory
- Dr. John-David Rocha, Rochester Institute of Technology
- Dr. Calvin Shipbaugh, Defense Threat Reduction Agency
- Dr. Jeff Stuart, Lockheed Martin
- Dr. Tom Tsotsis, The Boeing Company
- Dr. Jennifer Weisman, Strategic Analysis, Inc.
- Dr. Josh Wolfe, Johns Hopkins University Applied Physics Laboratory
- Dr. Mingjun Zhang, The University of Tennessee

Event Coordination Team

Conference Coordinator

Ms. Michelle Williams, Blue52 Productions, LLC

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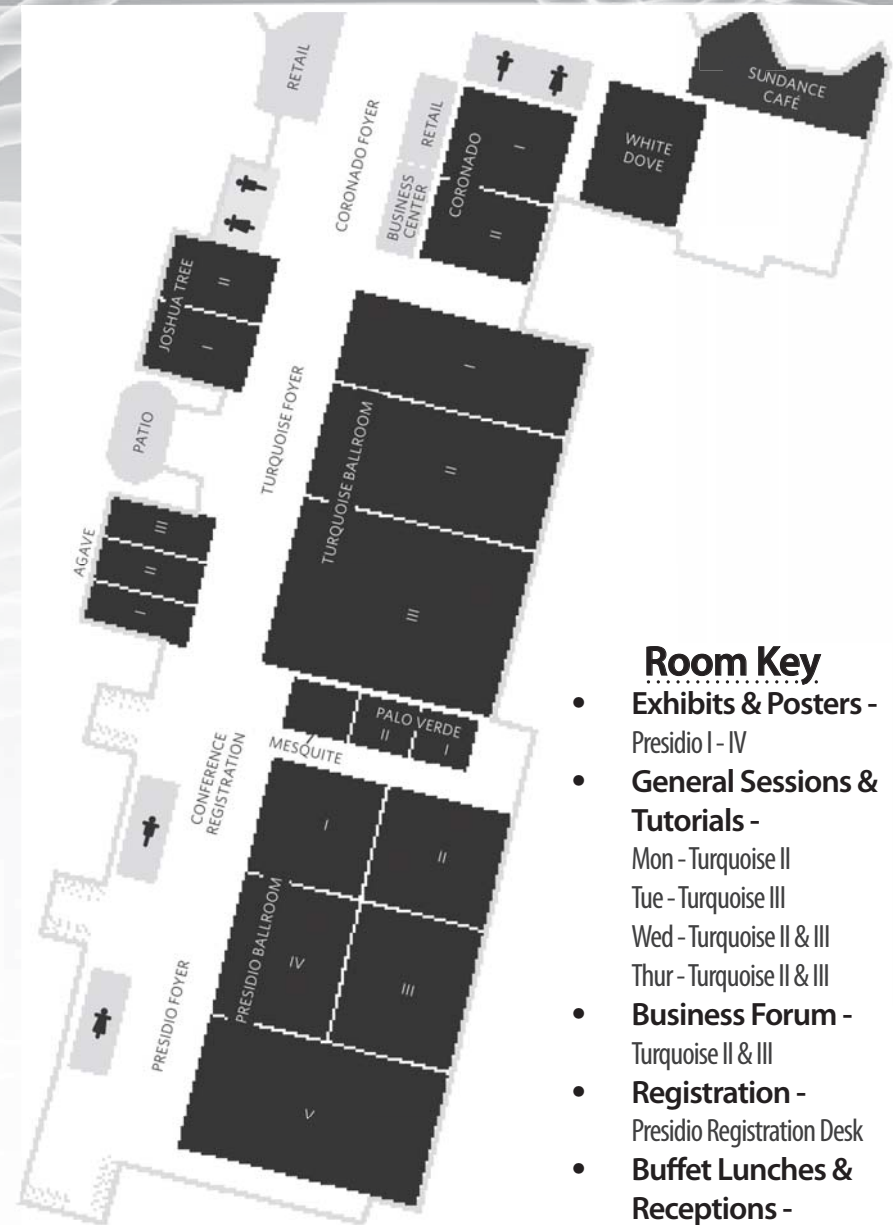
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Room Key

- **Exhibits & Posters -**
Presidio I - IV
- **General Sessions & Tutorials -**
Mon - Turquoise II
Tue - Turquoise III
Wed - Turquoise II & III
Thur - Turquoise II & III
- **Business Forum -**
Turquoise II & III
- **Registration -**
Presidio Registration Desk
- **Buffet Lunches & Receptions -**
Presidio I - IV

Sun, 3 & Mon, 4 November 2013

Mon, 4 & Tue, 5 November 2013

Sunday, 3 November 2013

- 1230 -->** Sabino Canyon Tour (Meet in the Foyer for Optional Car Pooling)
1700 – 2000 Registration (Presidio Registration Desk)

Monday, 4 November 2013

- 0730 – 0900** Continental Breakfast (Sundance Courtyard & Gazebo)
0730 – 1700 Registration (Presidio Registration Desk)
1000 – 1630 Exhibit Set-Up (Presidio I - IV)
1300 – 1630 Poster Set-Up (Presidio I - IV)
1700 – 1830 Welcome Reception / Exhibit Kick-Off & Poster Technical Interchange (Presidio I - IV)

Innovator's & Small Business Forum (ISBF)

Session Chairs: Mr. Dave Furdek, Boeing Research & Technology & Mr. Pratik Pandey, Lockheed Martin

Turquoise II

- 0830 – 0835** Welcome & Announcements
0835 – 0905 Keynote: DARPA Small Business Programs Office Overview
Ms. Susan Nichols, Program Director, DARPA Small Business Programs Office & SBIR/STTR Program Manager
0905 – 0935 TRL/ MLR Tutorial
Mr. Dale Iverson, Raytheon Missile Systems
0935 – 1000 Small Business Success Story: NanoSteel Company, Inc.
Mr. Ron Chewning, Director, Govt. Programs & Business Dvlpmt.
1000 – 1030 Break (Turquoise Foyer)
1030 – 1115 Prime & SBIR Agency Panel Discussion
1115 – 1130 One-on-One Instructions & Final Sign-ups
1130 – 1300 Lunch Break (On Your Own)

Are you interested in participating as a Prime next year? See the Conference Coordinator, Michelle Williams, at the registration desk.

ISBF, contd.

Turquoise III

1300 – 1430

One-on-One Meetings

1430 – 1500

Break (Turq. Foyer)

1500 – 1600

One-on-One Meetings

1600 – 1630

One-on-One Meetings
(run until 1700)

1700 – 1830

Welcome Reception / Exhibit Kick-Off & Poster Technical Interchange (Presidio I - IV)

Tutorials

Turquoise II

Acquiring R&D Funding from Federal Mission Agencies
Dr. Jim Murday, University of Southern Cal.

Break (Turquoise Foyer)

Nano Success Story: Fluorescence-based Explosives Trace Detector
Dr. Aimee Rose, FLIR Systems

ITAR & Security Awareness

Special Agent David Shoemaker, USAF Office of Special Investigations and Supervisory Special Agent Hal Manning, Homeland Security Investigations

Tuesday, 5 November 2013

- 0730 – 0900** Light Continental Breakfast (Presidio I - IV)
0730 – 0900 Exhibits & Posters Open (Presidio I - IV)
0730 – 1700 Registration (Presidio Registration Desk)
1130 – 1330 Networking Buffet Lunch (Pay-as-you-go \$15) (Presidio I - IV)
1130 – 1630 Exhibits & Posters Open (Presidio I - IV)
1700 – 1900 BBQ at the Last Territory (Hilton Last Territory Grounds)

Plenary Session

Turquoise III

- 0830 – 0845** Welcome & Announcements
0845 – 0930 Overview on the Current Status, Future Directions, and Role of Nanomaterials for Flex Hybrid Electronics
Dr. Malcolm Thompson, Nano-Bio Manufacturing Consortium
0930 – 1015 Applications of Nanotechnology to Meet Future Aerospace Needs - Current & Future Directions in NASA R&D
Dr. Michael Meador, NASA Glenn Research Center

Tuesday, 5 November 2013

- 1015 – 1045** Break (Presidio Foyer)
- 1045 – 1130** **Nanotechnology Signature Initiative (NSI) Overview**
Dr. Robert Pohanka, Director, National Nanotechnology Coordination Offc.
- 1130 – 1330** **Networking Buffet Lunch (Pay-as-you-go \$15) (Presidio I - IV)**
Avanti Buffet: Salad; Pan Fried Chicken with Spinach, Provolone Cheese, Onion Demi; Linguine with Choice of Basil Cream or Marinara Sauce; Ratatouille; Bread Sticks, Herb Focaccia and Ciabatta Bread; Ricotta Cheese Cake Tartlets, Cappuccino Tiramisu; Coffee and Tea

NanoTechnology for Applied Energy Storage, Generation, & Conservation

Session Chairs: Dr. Jim Murday, University of Southern California & Dr. Brian Valentine, Department of Energy

Turquoise III

- 1330 – 1350** **Nanoscale Materials for Use in Thermal Batteries**
Dr. Ganesh Skandan, NEI Corporation
- 1350 – 1410** **Carbon Electrodes and Nanoparticle-in-Ionic Liquid Electrolytes for Advanced Electrochemical Double Layer Capacitor Applications**
Mr. Steven Hamm, University of Missouri
- 1410 – 1430** **Energy Harvesting with Nano Antennas and Tunnel Diodes**
Dr. Martin Peckerar, CoolCAD Electronics, LLC
- 1430 – 1450** **One-step Waferscale Synthesis of 3-D Highly Branched Semiconductor Nanoarchitectures by Designed Chemical Catalysts for Substantial Improvement of Solar Water Oxidation Efficiency**
Prof. Emma Fan, The University of Texas at Austin

Nanotechnology for Biological Sensing & Biomedical Drug Delivery

Session Chairs: Dr. Tony Esposito, Defense Threat Reduction Agency & Dr. Jennifer Weisman, Strategic Analysis, Inc.

Turquoise III

- 1450 – 1510** **A Superparamagnetic Oponin for Pathogen Diagnosis and Sepsis Therapy**
Dr. Mike Super, Harvard University

Tue, 5 & Wed, 6 November 2013

- 1510 – 1540** Break (Presidio I - IV)
- 1540 – 1600** **Wearable Sensors for Human Health and Performance Monitoring**
Dr. Azar Alizadeh, GE Global Research
- 1600 – 1620** **Construction of Robust Conjugated-nanoparticles via Self Assembly: A Potential Approach for Biomedicine and Effective Decontamination**
Dr. Nisaraporn Suthiwangcharoen, US Army Natick Soldier RDEC

1620 – 1630 Poster Presentation Awards

Session Chairs: Dr. Jim Murday, University of California; Dr. Revell Phillips, DTRA; and Dr. Akbar Khan, DTRA

Turquoise III

- 1700 – 1900** **BBQ at the Last Territory - Guests Welcome, Tickets \$40 each**
(Hilton Last Territory Grounds)
Dinner Includes: Poppy Seed Slaw; Chipotle Penne Pasta Salad; Herb Roasted Chicken; Barbecue Beef Short Ribs; Red Roasted Potatoes with Rosemary; Corn on the Cob; Baked Beans; Buttermilk Biscuits and Corn Bread; Coconut Cake; Freshly Brewed Coffee, Decaffeinated Coffee, and Herbal Tea

Wednesday, 6 November 2013

- 0730 – 0900** **Continental Breakfast - Sponsored by Boeing** (Presidio I - IV)
- 0730 – 0900** **Exhibits & Posters Open** (Presidio I - IV)
- 0730 – 1700** **Registration** (Presidio Registration Desk)
- 1100 – 1300** **Networking Buffet Lunch (Pay-as-you-go \$15)** (Presidio I - IV)
- 1100 – 1800** **Exhibits & Posters Open** (Presidio I - IV)
- 1600 – 1800** **Networking Reception and Exhibit & Poster Technical Interchange - Sponsored by Lockheed Martin** (Presidio I - IV)
- 1800 – 2100** **Exhibits & Posters Dismantle** (Presidio I - IV)

NanoTechnology for Biological Sensing & Biomedical Drug Delivery, Cntd.

Session Chairs: Dr. Tony Esposito, Defense Threat Reduction Agency & Dr. Jennifer Weisman, Strategic Analysis, Inc.

Turquoise III

Nano Structural Composites / Ultra High-Strength, Ultra Lightweight

Session Chairs: Dr. Wade Adams, Rice University; Dr. Mary Ann Meador, NASA GRC; Dr. Michael Meador, NASA GRC; and Dr. Rich Vaia, Air Force Research Laboratory

Turquoise II

0830 – 0850

Phage-quantum Dot Nanoparticles: A New Paradigm for Biological Agent Detection/Diagnostics

Dr. Shanmuga Sozhamannan, The Chemical Biological Medical Systems, Joint Project Management Office

0850 – 0910

Stabilization of Enzymes via Stimulus-responsive Nanopolymer Architectures

Dr. Jeremy Walker, FLIR Systems

0910 – 0930

Tea Nanoparticles for Drug Delivery, Therapeutics and Bio-sensing

Dr. Mingjun Zhang, University of Tennessee

0930 – 0950

Surface-enhanced Raman Scattering (SERS): New Pathways for Rapid, Parallel and Low-level Pathogen Detection

Ms. Alexis Crawford, University of Utah

0950 – 1020

Break (Presidio Foyer)

The Role of Nanotechnology in the Development of Ultralightweight Materials for Aerospace and Defense

Dr. Michael Meador, NASA Glenn Research Center

Enhancing Interlaminar Shear Strength in Aircraft Composites

Dr. Martin Rogers, Luna Innovations, Inc.

Microstructural Characterization and Analysis of Cold Spray Al Alloys

Ms. Baillie McNally, Worcester Polytechnic Institute

Building Ultra Light Data Transmission Cables: Carbon Based Conductor and EMI Shielding

Dr. Stefanie Harvey, TE Connectivity

Break (Presidio Foyer)

1020 – 1040

Magnetic Nano- and Micro-transporters: Applications in Bioengineering

Dr. Ratnasingham "R" Sooryakumar, The Ohio State University

1040 – 1100

VitalHeme as a Nano-medicine for Traumatic Brain Injury with Hemorrhagic Shock

Dr. Carleton Hsia, SynZyme Technologies, LLC

1100 – 1300

Networking Buffet Lunch (Pay-as-you-go \$15) (Presidio I - IV)

Southwest Buffet Includes: Tortilla Soup; Grilled Asparagus, Black Bean, Grilled Corn and Cherry Tomatoes Salad; Orange, Mango, and Avocado Salad; Fajita Station with Spiced Chicken Strips, Blend of Peppers and Onions, Shredded Cheese, Sour Cream, Flour Tortillas, Refried Beans, Rice; Mexican Flan, Fried Churros with Vanilla Sauce; Coffee and Tea

Strengthening Epoxy/Carbon Nanotube Tensile Fiber Composites

Mr. Thomas Carlson, U.S. Army Corps of Engineers

Strong, Light, Multi-functional Fibers of Carbon Nanotubes with Ultrahigh Conductivity

Prof. Matteo Pasquali, Rice University

Next Generation Electronics

Session Chairs: Dr. Eric Snow, Naval Research Laboratory; & Dr. Chagaan Baatar, Office of Naval Research

Turquoise III

Nano Structural Composites & Ultra High-Strength, Ultra Lightweight, cntd.

Session Chairs: Dr. Wade Adams, Rice University;

Dr. Mary Ann Meador, NASA GRC; Dr. Michael Meador, NASA GRC; and Dr. Rich Vaia, Air Force Research Laboratory

Turquoise II

1300 – 1320

DoD Electronics Needs

Dr. Jeff Pond, Naval Research Laboratory

Harnessing the Potential of CNTs for High Performance Structural Composites through Ion Irradiation

Dr. Francesco Fornasiero, Lawrence Livermore National Laboratory

Wednesday, 6 November 2013

Wed, 6 & Thur, 7 November 2013

1320 – 1340 **High Dynamic Range Mixers in Carbon Nanotube Electronics**
Dr. John Przybysz, Northrop Grumman

Multifunctional Polymer Nanocomposites with Engineered Optical, Electronic and Bioactive Properties
Dr. Michael Bockstaller, Carnegie Mellon University

1530 – 1550 **Nanoscale Multiferroic Materials for Electromagnetic Devices**
Prof. Greg Carman, University of California, Los Angeles

Spark Plasma Sintering of Alumina and Silicon Carbide for Numerical Simulation Verification and Development of Super Ceramic Materials
Mr. Thomas Carlson, U.S. Army Corps of Engineers

1340 – 1400 **Scalable Carbon Nanotube Electronic Devices for Space Nanoelectronics Applications**
Dr. Quoc Ngo, Lockheed Martin Space Systems

Polymer Aerogels for Aerospace Applications
Dr. Mary Ann Meador, NASA Glenn Research Center

1600 – 1800 **Networking Reception and Exhibit & Poster Technical Interchange - Sponsored by Lockheed Martin - (Presidio I - IV)**

1400 – 1420 **Three Dimensional Nanowire Arrays for Chemical and Biological Detections**
Dr. Timothy Langan, Surface Treatment Technologies, Inc.

Graphene Nanoribbons Produced by Laser Technology & Carbon Nanotube/Graphene Hybrid Foam: Processing and Characterization
Dr. Mei Zhang, Florida State University

Thursday, 7 November 2013

0730 – 0900 **Continental Breakfast** (Sundance Courtyard & Gazebo)
0730 – 1500 **Registration** (Presidio Registration Desk)
1100 – 1300 **Lunch Break** (On Your Own)

1420 – 1440 **Plasmonic Rotary Nanomotors for Controlled Biochemical Release and Detection with Raman Spectroscopy**
Prof. Emma Fan, The University of Texas at Austin

Low Frequency Acoustic Mixing of Nanomaterials
Dr. Peter Lucon, Resodyn Corporation

1440 – 1510 **Break** (Presidio I - IV)

Break (Presidio I - IV)

1510 – 1530 **Graphene– and Nanowire–based Tunable Transparent Antennas and RF Front End**
Dr. Kyung-ah Son, HRL Laboratories

Continuous Extrusion Process for Preparation of Polymer Nanocomposites
Dr. John Shearer, University of Massachusetts

Nano & Bio Print Devices / NanoManufacturing for R2R Devices

Session Chairs: Session Chairs: Dr. John Busbee, Xerion Materials Corporation and Dr. Jeff Stuart, Lockheed Martin

Turquoise III

Optics & Photonics

Session Chairs: Dr. Vladimir Shkunov, Raytheon & Dr. John Herold, Raytheon

Turquoise II

0830 – 0850 **Functional Electronic and Optical Devices Via Additive Driven Self-assembly and Nanoimprint Lithography: Towards Solution-based R2R Fabrication**
Prof. James Watkins, University of Massachusetts Amherst

Nanomaterials for High Performance Infrared Imaging
Dr. Jay Lewis, RTI International

0850 – 0910 **Printed Sensor Systems**
Dr. Janos Veres, Electronic Materials & Devices Laboratory

Micro-lens for IR based on Polaritonic Metamaterial Layer Nano-patterned on Si Wafer Surface
Dr. Vladimir Shkunov, Raytheon

- | | | |
|--------------------|--|---|
| 0910 – 0930 | Beyond 3D and Electronic Printing: Nanoscale Offset Printing Platform for Sensors, Electronics, Energy and Material Applications
Dr. Ahmed Busnaina, Northeastern University | THz Metamaterials Photonics for Sensing and Imaging
Prof. Margaret Kim, University of Alabama |
| 0930 – 0950 | Nanomanufacturing with Polymer Materials for Roll to Roll Applications
Dr. Joey Mead, University of Massachusetts Lowell | A Novel Route for Fabricating Printable Photonic Devices
Dr. Christophe Peroz, aBeam Tech / LBNL |
| 0950 – 1010 | Carbon Nanotube Composite Patterns for Flexible and Ultrasensitive Pressure Sensing
Dr. Jin-Woo Choi, Louisiana State University | Oblique Angle Transmission Spectroscopic Measurements on InGaN/GaN Dot-in-a-Wire Heterostructures
Dr. Unil Perera, Georgia State University |
| 1010 – 1040 | Break (Presidio Foyer) | |
| 1040 – 1100 | Defense Applications for MC10 Wearable Physiological Platforms in Biofluid Monitoring and Diagnosis
Mr. Barry Ives, mc10, Inc. | Very High Laser-damage Threshold of Polymer-derived Si(B)CN- Carbon Nanotube Composite Coatings
Dr. Gurpreet Singh, Kansas State University |
| 1100 – 1300 | Lunch Break (On Your Own) | |

Are you interested in participating on one of the planning committees for NT4D? See the Conference Coordinator, Michelle Williams, at the registration desk.

Materials Synthesis & Scale-up of NanoMaterials to Industrial Scale

Session Chair: Dr. John-David Rocha, Rochester Institute of Technology

Turquoise III

- | | |
|--------------------|--|
| 1300 – 1320 | Novel Mixed Metal-oxide Nanocomposite Films for Ultrafast High-performance Gas Sensors
Prof. Olusegun Ilegbusi, University of Central Florida |
| 1320 – 1340 | Nano Lubricant/Fluid for Improved Weapons Systems
Dr. Ganesh Skandan, NEI Corporation |
| 1340 – 1400 | Understanding Separation and Functionalization Processes of High Purity Semiconducting SWCNTs via Spectrofluorimetric Kinetic Analysis
Dr. John-David Rocha, Rochester Institute of Technology |
| 1400 – 1420 | A Step Toward Increasing the Length of Long V-MWNT Arrays and Increasing Production of Carbon Nanotubes
Dr. Steven Crossley, The University of Oklahoma |
| 1420 – 1440 | A New Low Cost Route to Synthesis of Graphene and Graphenol Nanoparticles
Dr. Gary Beall, National Nanomaterials, Inc. |
| 1440 – 1500 | Electrochemical Properties of Sub-2nm Pt Nanoparticles - Stability, Doping Effect on Graphene and Evidence of Hydrogen Spillover
Mr. Steven Hamm, University of Missouri |
| 1500 | Conference Adjourns |

Poster Session Chairs: Dr. Jim Murday, University of California; Dr. Revell Phillips, Defense Threat Reduction Agency; and Dr. Akbar Khan, Defense Threat Reduction Agency

The NanoTechnology for Defense Conference Poster Session has a superb array of presentations located in Presidio I-IV. Posters are organized alphabetically by the authors last name. The Monday and Wednesday evening receptions will have a special focus on the posters. Authors will be available for discussion at these receptions. Please plan to spend some time meeting and talking with these leading edge researchers, scientists, and engineers and place your vote for the "Best Peer Reviewed Poster."

- **High-rate Manufacturing of 3D Products with Micro and Nanostructured Surfaces**, Dr. Carol Barry, University of Massachusetts Lowell
- **Cold Spray Modeling: Simulating Particle Impact as a Tool for Predicting Properties of a Cold Sprayed Deposits**, Mr. Luke Bassett, Worcester Polytechnic Institute
- **Through-process Modeling for Cold Spray Alloy Optimization**, Ms. Danielle Belsito, Worcester Polytechnic Institute
- **Numerical Process Control Modeling of the Laser Assisted Cold Spray Material Deposition Technique**, Mr. Aaron Birt, Worcester Polytechnic Institute
- **Manipulating Adsorption of Ionomers in Layered Double Hydroxides**, Mrs. LaDena Bolton, Clark Atlanta University
- **Changing Physical Characteristics of Vertical Carbon Nanotubes Grown between Mica Sheets**, Mr. Nicholas Briggs, University of Oklahoma
- **Lightweight, Low Cost Nanomaterial Shielded Cables and Harnesses**, Mrs. Megan Caprio, San Diego Composites, Inc.
- **Wear Resistant Titanium Powders- TITRIX for Coatings**, Dr. Bhanu Chelluri, IAP Research, Inc.
- **Nano Technology and Electromagnetic Phenomena: Control of Magnetic Properties via Electrical Input Utilizing High -K Dielectric Nano-constituent Ultra-thin Film Materials to Enhance the Converse Magnetoelectric Effect**, Ms. Melanie Cole, Army Research Laboratory
- **Manufacturing-friendly Processes for Mass Production of Silicone Nanotube (SINT) Anodes for Next Generation Li-ion Batteries**, Dr. Jyoti Dalvi-Malhotra, Brewer Science, Inc.
- **Biomimetic Synthesis of Hybrid Nanomaterials with Antimicrobial Activity**, Dr. Matthew Dickerson, Air Force Research Laboratory

- **Three Dimensional Graphene/Graphite Structures Templated on Engineered Highly Porous Ni/Cu Foams**, Prof. Emma Fan, University of Texas at Austin
- **Ordered Arrays of Ultrahigh-speed Rotating Nanoelectromechanical System (NEMS) Devices Assembled from Nanoscale Building Blocks**, Prof. Emma Fan, The University of Texas at Austin
- **Integration of UV-cured Ionogel Electrolyte with Carbon Paper Electrodes in a Coplanar Supercapacitor Test Bed**, Ms. Stephanie Flores, U.S. Army Natick Soldier Research, Development & Engineering Center / Tufts University
- **Investigation of Carbon Nanotube Templates to Enhance the Sensing Capabilities of Protein Embedded Nanofibers**, Dr. Ericka Ford, U.S. Army Natick Soldier Research, Development & Engineering Center
- **Breathable and Protective Fabrics Based on Carbon Nanotube Membranes**, Dr. Francesco Fornasiero, Lawrence Livermore National Laboratory
- **Electrical Characterization of Multi-walled Carbon Nanotube Sheet Material at RF Frequencies**, Dr. Jonathon Foster, Raytheon
- **Roll-to-Roll Silver Nanowire Transparent Conductive Films and Inks Enabling Flexible Antennas and Sensors**, Mr. Andrew Fried, Carestream Advanced Materials
- **Electronics-grade Carbon Nanotube Solutions for Commercial Applications**, Dr. Stephen Gibbons, Brewer Science, Inc.
- **Low-cost Metallic Gratings as Platforms for Ultra-sensitive Plasmonic-enhanced Chemical and Biological Sensors**, Mr. Steven Hamm, University of Missouri-Columbia
- **Scaling CNS Infused Shielding into Cable Manufacturing**, Dr. Stefanie Harvey, TE Connectivity
- **Nanometal Fuels, Nanothermites, and Nanoadditives for Propulsion**, Dr. David Irvin, Systems and Materials Research Corporation
- **Nanomaterial Framework and Screening Tools: Techniques to Meet Health and Safety Goals**, Mr. Alan Kennedy, U.S. Army Engineer Research and Development Center
- **Biofunctionalized Sensors to Enable Human Performance Monitoring**, Dr. Steven Kim, UES, Inc. at AFRL
- **60-inch Nano Adaptive Hybrid Fabric (NAHF-X) System - Commercial-size Scale-up of Hybrid Fabrics for Multifunctional Composites**, Dr. Paul Kladitis, University of Dayton Research Institute

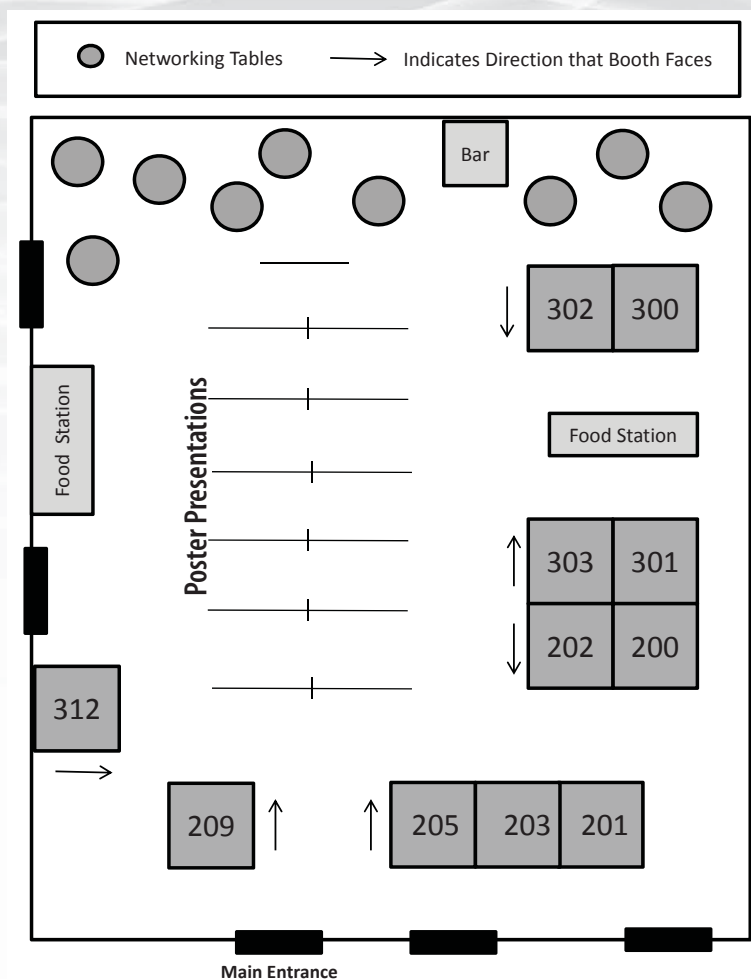
- **Reversing Coagulopathy and Internal Hemorrhage with Functionalized Nanoparticles**, Mr. Damien Kudela, University of California, Santa Barbara
- **Novel Method of Nanosizing and Deagglomeration of Materials**, Mr. Eric Kuramoto, THINKY USA, Inc.
- **Design of a Superhydrophobic Superoleophobic Liquid Aerosol Barrier**, Dr. Hoon Joo Lee, North Carolina State University
- **Single-walled Carbon Nanotube/Polystyrene Composites: Effect of Polymer Stereochemistry on Nanocomposite Formation**, Ms. Laurisa London, Clark Atlanta University
- **Integrated Electrophoretic Capillary Nanofluidic Biochip for Separation of Long DNA Molecules (ECField-Nanochip™)**, Dr. Edgar Mendoza, Redondo Optics, Inc.
- **The Application of Silver Nanowire Coated Film in Military Electronics**, Dr. Robert Monson, Carestream Advanced Materials
- **Gold Nanoparticle Synthesis using Spatio-temporally Shaped Femtosecond Laser Pulses: Post Irradiation Auto-reduction of Au(III)**, Dr. Johanan Odhner, Temple University
- **Functional Conductive Polymeric Nanofibers as Antibody Sensors**, Ms. Omotunde Olubi, Clark Atlanta University
- **Energy Harvesting with Nano Antennas and Tunnel Diodes**, Dr. Martin Peckerar, CoolCAD Electronics, LLC
- **Synthetic Approaches for Utilization of Active Polyoxometalate Compounds for Decontamination**, Dr. Brian Rasley, University of Alaska Fairbanks
- **Plasmon-coupled Exciton Photoluminescence with Purcell Enhancement**, Mr. Quinton Rice, Hampton University
- **Pilot Scale Coating Process of Fluorodecyl Polyhedral Oligomeric Silsesquioxane (Fluoro-POSS) Based Omniphobic Coatings**, Mr. Michael Sieber, U.S. Army Natick Soldier Research, Development & Engineering Center
- **Self-healing, Chromate-free Pretreatment for Magnesium Alloys: From Beakers to Drums**, Dr. Ganesh Skandan, NEI Corporation
- **Enhanced Reactivity of Energetic Nanomaterials Using Protein Cages**, Dr. Joseph Slocik, Air Force Research Laboratory
- **Development of a Paper Based Roll-to-Roll Thermal Nanoimprinting Machine**, Mr. Byungwook Son, University of Massachusetts Lowell
- **Miniaturized Nanoenergetic Divergence Thrusters for Impulsive Projectile**

- **Control**, Mr. Clay Staley, University of Missouri
- **Impact of Nanoparticles in Aquatic Models: Sea Urchin's Immunity and Development**, Dr. Ashok Vaseashta, Norwich University Applied Research Institutes, International Clean Water Institute & Institute for Advanced Sciences Convergence
- **Manufacture of Hierarchical, Multifunctional Structural Composites Using a Novel Scalable and High Energy-efficiency Nanoengineering Technique**, Dr. Jialai Wang, The University of Alabama
- **Progress in Reactive Self-decontaminating Additives for Polyurethane Topcoat**, Dr. James Wynne, Naval Research Laboratory
- **One-step Synthesis of Dendritic Gold Nanoflowers with High Surface-enhanced Raman Scattering (SERS) Property**, Ms. Sijia Yi, University of Tennessee
- **Nano-carbon Conductive Elastomer**, Dr. Mei Zhang, Florida State University
- **Cancer Immuno-chemotherapy Using Fungal Nanoparticles**, Dr. Mingjun Zhang, The University of Tennessee at Knoxville
- **Joint Effort between AMRI/UNO and ST2 for Developing Nanostructure Based Chemical Sensors for Detection of Toxic Chemical Simulants**, Dr. Weilie Zhou, Advanced Materials Research Institute (AMRI)

Exhibit Show & Poster Hours

Monday: 1700 - 1830
Tuesday: 0730 - 0900 & 1130 - 1630
Wednesday: 0730 - 0900 & 1100 - 1800

Exhibit Show Floor Plan



Brewer Science, Inc. – 202

<http://www.brewerscience.com>

Brewer Science, Inc., creates, designs, and manufactures custom materials and associated processes and equipment. Brewer Science will showcase its Carbon Electronics Center and new technology research and development capability at NT4D. The Carbon Electronics Center develops carbon nanotube (CNT) inks for printed electronic applications and microelectronics-grade CNT coatings for advanced memory and sensor applications. Brewer Science provides competency in both prototyping and testing of CNT-based devices. A new technology research and development team also utilizes Brewer Science's core technology to provide solutions to the challenges associated with LED manufacturing, electronics design, and other markets.

Center for High-Rate Nanomanufacturing, Northeastern University – 200

<http://www.nanomanufacturing.us>

The NSF NSEC Center for High-rate Nanomanufacturing at Northeastern University in Boston is developing tools and processes to manufacture nanotechnology-based devices for the military, electronics, energy, materials and biomed sectors. The CHN has demonstrated devices such as chemical sensors, biosensors, interconnects, energy harvesters, NEMS, etc. with 2D and 3D nanoscale features made of carbon nanotubes and nanoparticles at high rates and over large areas on various substrates, including flexible ones. Through its Industrial Partners Program, the CHN has close ties with companies in Massachusetts, New England and beyond.

General Nano, LLC – 201

<http://www.generalnanollc.com>

General Nano manufactures long, aligned Carbon Nanotube (CNT) materials for aerospace and defense applications. Materials forms include large area CNT arrays on stainless steel foils, and CNT sheets, yarns and tapes. Target applications include EMI Shielding, Composites, Thermal Interface Materials, Stray Light Absorbers, Capacitors and Batteries.

Nano-Bio Manufacturing Consortium – 300

<http://www.nbmc.org>

FlexTech Alliance, in collaboration with a nationwide group of partners, has formed a Nano-Bio Manufacturing Consortium (NBMC) for the U.S. Air Force Research Laboratory (AFRL). The mission of this partnership is to bring together leading scientists, engineers, and business development professionals from industry and universities in order to work collaboratively in a consortium, and to mature an integrated suite of nano-bio manufacturing technologies to transition to industrial manufacturing. The first NBMC Solicitation in July 2013 was on Human Performance Monitoring and Biomarker Detection.

Nanocomp Technologies, Inc. – 312

<http://www.nanocomptech.com>

Nanocomp Technologies produces carbon nanotube (CNT) spun yarn and non-woven sheets to support applications in DoD, energy, and medical markets. The CNT yarn and sheet exhibit desirable mechanical, electrical, and thermal properties for numerous applications including lightweight EMI / ESD shielding for cables and composites, hybrid armor systems, multifunctional composites, and conformal antennas.

Nanomanufacturing Center, University of Massachusetts Lowell – 303

<http://www.uml.edu/research/centers/nano>

The University of Massachusetts Lowell Nanomanufacturing Center builds on the University's expertise in polymer manufacturing and environmental health and safety to develop state-of-the-art nanomanufacturing processes for high rate, high volume production of polymer-based nanomaterials. These processes and materials find application in sensors, nanoelectronics, EMI shielding, metamaterials, barrier/packaging, and bio-based products. Concurrent assessment of nanoparticle emissions, toxicity screening, and recycling of nanomaterials compliment the manufacturing processes and are available to industry through the Nano Health Consortium.

Nano-PM – 301

<http://www.nano-pm.com>

Nano-PM is a global professional services provider that supports organizations that invest in, own, and operate advanced technology assets. Nano-PM focuses on full life cycle integration by first evaluating business readiness of nanotechnology products for market; then program planning and management of scope, budgets and schedules to transform from research and small scale production to facilities capable of commercial market performance. Working globally from the United States with offices in Colorado, Arizona, and Texas, we are adding value to companies across the nanotechnology, semiconductor, microelectronics, biological, nanotechnology, research laboratories, mission critical data centers and sustainable facilities sectors worldwide. Within the last year Nano-PM principals have provided overall Program Management as Owner's Agents for major semiconductor manufacturers, on a 90,000 sf cls 1 expansion, a 300,000 sf Technology Development Center, and a new 500,000 sf cls 1 clean room, 450mm wafer capable facility.

National Nanotechnology Coordination Office – 203

<http://www.nano.gov>

The National Nanotechnology Initiative (NNI) is a U.S. Government research and development initiative that coordinates funding for nanotechnology among the participating Federal departments and agencies. The NNI vision is a future in which the ability to understand and control matter at the nanoscale leads to a revolution in technology and industry that benefits society. The NNI's member agencies advance a world-class nanotechnology research and development program leading to new materials, devices, and products. The NNI supports the development of robust educational resources, a skilled workforce, supporting infrastructure and tools, as well as a coordinated research strategy to study the potential environmental, health, safety, and societal impacts of nanotechnology.

Exhibit Show

National Reconnaissance Office – 205

<http://dii.westfields.net>

The National Reconnaissance Office's Director's Innovation Initiative Program invests in advanced technologies, fosters innovation, and provides R&D seed funding to push the boundaries of technology to dramatically improve our overhead remote sensing capabilities. It presents an opportunity for developers not traditionally associated with the NRO.

Novati Technologies – 302

<http://www.novati-tech.com>

Novati Technologies is the leading innovation partner for accelerating nanotechnology development and commercialization. Novati's proven advanced technology and secure IP infrastructure combined with our Technology Development Process supports companies developing novel technologies for the Aerospace & Defense market. Novati Technologies is located within a 300,000 square foot "center of innovation" in Austin, TX, that houses advanced development 200mm/300mm silicon wafer facilities, including over 68,000 square feet of Class 10 clean rooms equipped with 200mm and 300mm wafer processing tools. The complex incorporates state-of-the-art, R&D and prototype manufacturing for micro/nanotechnology, microfluidics, photonics, MEMS and MOEMS, 3D IC/WLP/TSV integration, non-volatile memory, and III-V integration.

Raith America, Inc. – 209

<http://www.raith.com>

Raith and Vistec have combined to form the largest organization across the globe specialized in providing innovative instrument solutions for electron beam lithography, ion beam lithography, nano manipulation, electron beam induced deposition and etching. With sub 10 nm linewidth guaranteed, Raith and Vistec electron beam lithography systems provide state of the art performance. Beyond established nano lithography capabilities, the core instruments are extended to versatile nano engineering solutions.

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