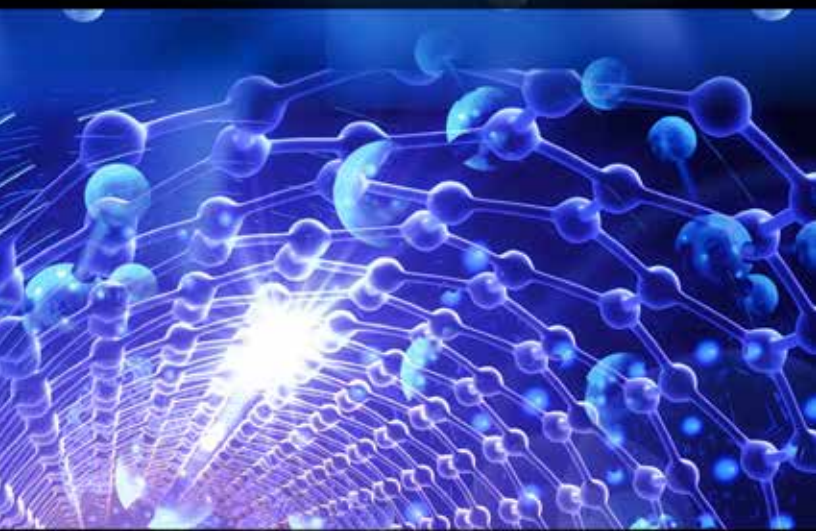




2015

Nano for Defense

Transitioning Emerging Technologies



16 – 19 November 2015

City of Industry, CA

CONFERENCE AGENDA



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 or make phone calls.
 - The exception to this rule are computers or tablets used to take notes. However, 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 go to 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 room 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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doors for others and foster
business opportunities for all.

 **BOEING**

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Technical Interchange Ambassador

Lockheed Martin Corporation

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Conference Technical Advisors

Dr. John Busbee, Xerion Advanced Battery Corporation
Dr. Anthony Esposito, Defense Threat Reduction Agency
Dr. Randy Mrozek, U.S. Army Research Laboratory
Dr. Paul Sheehan, Naval Research Laboratory
Dr. Richard Vaia, Air Force Research Laboratory

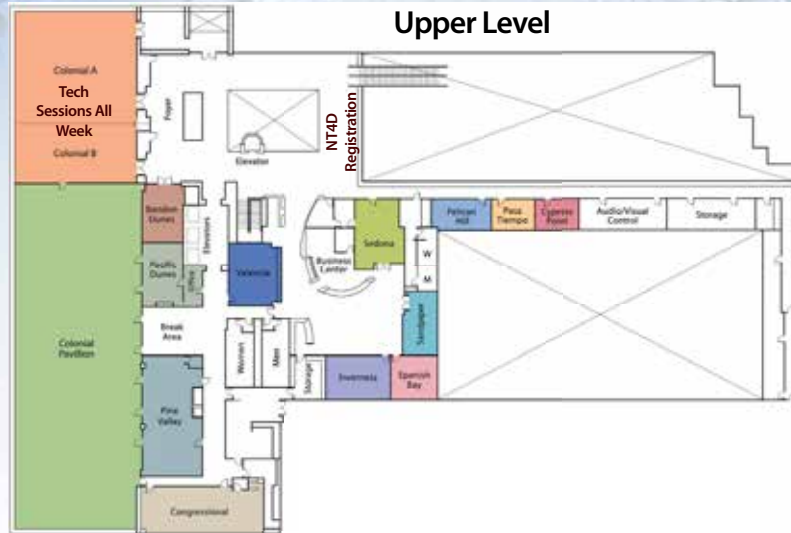
Steering Committee

Dr. Wade Adams, Rice University
Dr. Khershed Cooper, National Science Foundation
Mr. Robert "Kelly" Dodds, Raytheon Space & Airborne Systems
Dr. Matthew Hull, Virginia Tech Institute for Critical Technology and Applied Science
Dr. Marvi Matos, Boeing Research & Technology
Dr. Michael Meador, National Nanotechnology Coordination Office
Dr. James Murday, University of Southern California
Dr. Nicholas Panaro, Leidos Biomedical Research, Inc.
Dr. Revell Phillips, Defense Threat Reduction Agency
Dr. Nat Shankar, Lockheed Martin Space Systems Company
Dr. Edward Silverman, Northrop Grumman Corporation
Dr. Edwin "Ned" Thomas, Rice University
Dr. Jennifer Weisman, Strategic Analysis, Inc.

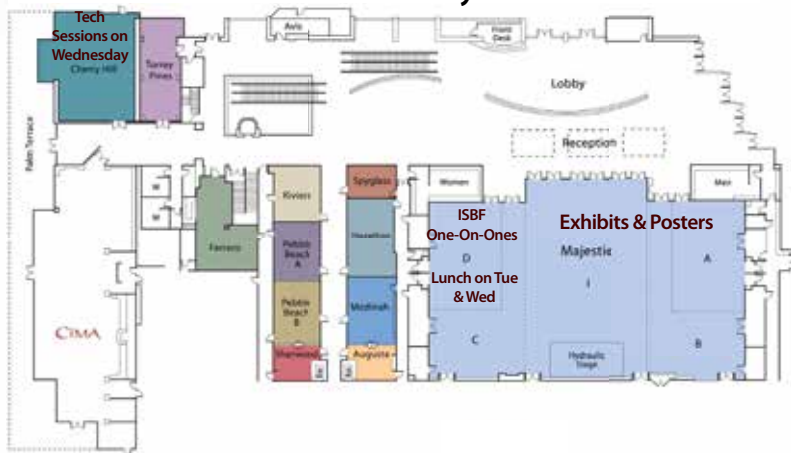
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- Dr. Scott Anderson, Lockheed Martin Corporation
- Dr. Kay Blohowiak, The Boeing Company
- Dr. Lawrence Butkus, Air Force Research Laboratory
- Prof. Jonathan Claussen, Iowa State University
- Dr. Cathie Condron, Defense Threat Reduction Agency
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- Dr. Susan Ermer, Lockheed Martin Space Systems Company
- Dr. Adam Friedman, Naval Research Laboratory
- Dr. Justin Golightly, Lockheed Martin Space Systems Company
- Ms. Wendy Goodson, Air Force Research Laboratory
- Dr. Mark Griep, U.S. Army Research Laboratory
- Prof. A.T. Charlie Johnson, University of Pennsylvania
- Dr. Jacob Jordan, Defense Advanced Research Projects Agency
- Dr. Nancy Kelley-Loughnane, Air Force Research Laboratory
- Dr. Benjamin Leever, Air Force Research Laboratory
- Dr. Joey Mead, University of Massachusetts Lowell
- Dr. Heather Meeks, Defense Threat Reduction Agency
- Dr. Rajesh Naik, Air Force Research Laboratory
- Dr. Quoc Ngo, Lockheed Martin Space Systems Company
- Dr. Josh Orlicki, U.S. Army Research Laboratory
- Mr. David Petersen, Defense Threat Reduction Agency
- Ms. Laura Rea, Air Force Research Laboratory
- Dr. Ajit Roy, Air Force Research Laboratory
- Dr. Alan Samuels, Edgewood Chemical Biological Center
- Mr. James Sumner, U.S. Army Research Laboratory
- Dr. Malcolm Thompson, Nano-Bio Manufacturing Consortium
- Prof. Mark Tuominen, University of Massachusetts
- Mr. Peter Vandevanter, Defense Threat Reduction Agency
- Dr. Andrey Voevodin, University of North Texas
- Dr. Michael Wixom, Navitas Systems
- Dr. Michael Weibel, JRAD, Inc.
- Dr. Brandy White, Naval Research Laboratory
- Dr. Natalie Wisniewski, Profusa, Inc.

Upper Level



Lobby Level



Sunday, 15 November 2015

1600 - 2000 Early Registration

Monday, 16 November 2015

0700 - 0830 **Attendee Continental Breakfast** (*Colonial Foyer*)
(Sponsored by The Boeing Company)

0700 - 1700 **Registration Open** (*Colonial Foyer by Escalator*)

0715 - 0745 **Speaker Meeting for Monday Presenters**
(*In Room You Are Presenting In*)

1000 - 1630 **Exhibits & Posters Set-Up** (*Majestic A, B, I*)

1130 - 1300 **Lunch Break** (*On-Your-Own*)

1700 - 1830 **Exhibit & Poster Session Kick-Off/Welcome Networking Reception (Hors d'oeuvres & Cash Bar)** (*Majestic A, B, I*)

Tutorials, Workshops, & Innovators and Small Business Forum (ISBF)

Tutorial & Workshop Chair: Dr. Khershed Cooper, National Science Foundation

Innovators & Small Business Forum Chairs: Dr. Donald DiMarzio, Northrop Grumman Aerospace Systems; Dr. Susan Ermer, Lockheed Martin Space Systems Company; and Dr. Marvi Matos, The Boeing Company

Track One (*Colonial A*)

0800 - 0810 **Innovators & Small Business Forum (ISBF)**
Welcome & Announcements
Dr. Susan Ermer, Lockheed Martin Space Systems Company and
Dr. Marvi Matos, The Boeing Company

0810 - 0840 **ISBF: Air Force Programs for Small Businesses**
Mr. David Sikora, Acquisition Program Manager, Air Force Small
Business Office

0840 - 0910 **ISBF: From Lab to Market: Case Studies**
Dr. Seth Coe-Sullivan, Co-Founder and Chief Technology
Officer, QD Vision, Inc.

0910 - 0940 **ISBF: Opportunities for Collaboration in R&D at the Army Research Laboratory**
Mr. Steve Taulbee, General Engineer
Office of the Director, Weapons and Materials Research
Directorate, U.S. Army Research Laboratory

Track Two (*Colonial B*)

Track Three (*Majestic C & D*)

Thank You to Our 2015 NT4D ISBF Primes and SBIR Agencies

Air Force Small Business Office
Army Research Laboratory SBIR
The Boeing Company
DARPA SBIR Program
Chem-Bio Defense SBIR/STTR & DTRA SBIR/STTR Programs
Lockheed Martin
Missile Defense Agency (MDA) Advanced Research SBIR/STTR
Northrop Grumman
Raytheon Company

If you would like to sign up for a one-on-one appointment on Monday with one of these organizations, visit the registration desk.

0940 - 1010	ISBF: SBIR Technology Commercialization: Manufacture, License, or Sell Dr. James Garrett, Vice President, Technology Development Division, Luna Innovations Incorporated		
1010 - 1040	Break (Colonial Foyer)		
1040 - 1130	ISBF: Speaker Panel on Surviving the Valley of Death - Moving Successfully from Phase 1 to Phase 2 Moderator: Dr. Marvi Matos, The Boeing Company	Corporate Espionage in the Science & Technology World Special Agent Michaela Ludwick and Special Agent Cheney Mak, Federal Bureau of Investigation	
1130 - 1300	Lunch Break (On-Your-Own)		
1300 - 1500	Human and Environmental Health and Safety for Nanotechnology: Basics of Nano EHS LT Kevin Dunn, U.S. Public Health Service; Dr. Charles Geraci, National Institute for Occupational Safety and Health; and Dr. Jeffrey Steevens, U.S. Army Corps of Engineers	A Workshop on Cloaking for Sound and Light Using Metamaterials Organizers: Dr. Clara Rivero-Baleine, Lockheed Martin and Dr. Ned Thomas, Rice University Speakers: Dr. Nicholas Fang, Massachusetts Institute of Technology; Dr. Erik Lier, Lockheed Martin Space Systems Company; and Mr. Charles Chase, Lockheed Martin Skunk Works	Innovators & Small Business Forum One-on-One Appointments
1500 - 1530	Break (Colonial Foyer)		
1530 - 1700	Workshop on Nanoinformatics Organizer: Dr. Mark Tuominen, University of Massachusetts Speakers: Dr. Mark Hoover, NIOSH/CDC and Dr. Gerhard Klimeck, Purdue University	Risk Prevention & Mitigation: Protecting Contractors and the Military's Investment in Nanotechnology Mr. Raymond Biagini, Partner, Covington & Burling, LLP	Innovators & Small Business Forum One-on-One Appointments
1700 - 1830	Exhibit & Poster Session Kick-Off/Welcome Networking Reception (Hors d'oeuvres & Cash Bar) (Majestic A, B, I)		

Tuesday, 17 November 2015

0700 - 0830	Attendee Continental Breakfast (<i>Colonial Foyer</i>)
0700 - 1730	Registration Open (<i>Colonial Foyer by Escalator</i>)
1200 - 1330	Networking Lunch in the Exhibit Hall - \$12 - <i>Cash Only</i> (<i>Majestic C & D</i>)
1200 - 1600	Exhibits & Posters Open (<i>Majestic A, B, I</i>)
1245 - 1315	Speaker Meeting for Tuesday Afternoon Presenters (<i>In Room You Are Presenting In</i>)
Plenary Session (Colonial A & B) Session Chairs: Dr. John Busbee, Xerion Advanced Battery Corporation; Dr. Anthony Esposito, Defense Threat Reduction Agency; Dr. Randy Mrozek, U.S. Army Research Laboratory; Dr. Paul Sheehan, Naval Research Laboratory; and Dr. Richard Vaia, Air Force Research Laboratory	
0800 - 0810	Announcements Dr. John Busbee , Chief Executive Officer, Xerion Advanced Battery Corp & NT4D Advisor
0810 - 0815	Welcome & Moderation Dr. Timothy Bunning , Chief Scientist, Materials & Manufacturing Directorate, Air Force Research Laboratory
0815 - 0855	Dr. Steven Wax , Chief Scientist, J9, Defense Threat Reduction Agency
0855 - 0935	Mr. Charles Chase , Senior Program Manager, Revolutionary Technology Programs, Lockheed Martin Skunkworks
0935 - 1015	Dr. Douglas Deason , Director Advanced Technology, Missile Defense Agency
1015 - 1045	Break (<i>Colonial Foyer</i>)
1045 - 1125	Dr. R. Stanley Williams , Vice President, Hewlett Packard Enterprise Labs
1125 - 1200	Fireside Chat with Plenary Speakers
1200 - 1330	Networking Lunch in the Exhibit Hall - \$12 - <i>Cash Only</i> (<i>Majestic C & D</i>)

Collaboration & Networking

There are many opportunities built into the program for collaboration & networking. Here are a few you should take advantage of:

- Side Meetings: We have nearly a dozen side meeting rooms available to you at no cost. This is a great opportunity to meet with your colleagues while all located in one spot. Sign up for meeting rooms at the registration desk.
- Innovators & Small Business Forum One-On-Ones on Monday. Meet with as many as 9 Primes & SBIR Agencies to discuss collaboration opportunities.
- Monday & Wednesday Exhibit Show, Poster Session Interchange, & Receptions. Visit booths and talk with poster authors about their research. Located in the Majestic A, B, I
- Tuesday & Wednesday Networking Lunches in the Exhibit Hall. Meet by topic area or random seating to meet new people in your field. Only \$12 (Cash Only)
- Thursday NT4D Happy Hour at Red Patio. Enjoy conversation with colleagues, appetizers, and music with mountains as your backdrop.
- Friday JPL Tour with your colleagues

Track One (Colonial A & B)		Track Two (Cherry Hill)
Next Generation Electronics Session Chairs: Dr. Ashok Maliakal, LGS Innovations and Dr. Quoc Ngo, Lockheed Martin Space Systems Company		Safety & Health Session Chairs: Dr. Matthew Hull, Virginia Tech Institute for Critical Technology and Applied Sciences; Dr. Michael Meador, National Nanotechnology Coordination Office; and Dr. Randy Mrozek, U.S. Army Research Laboratory
Sub-Session 1: Flexible and Printed Electronics		
1330 - 1335	Session Introduction	Session Introduction
1335 - 1400	2D Thin Film Transistors for Flexible Electronics Dr. Saptarshi Das, Argonne National Laboratory	The Dilemma of Null Results in Environmental and Human Health Nanotoxicology Dr. Steve Oldenburg, nanoComposix, Inc.
1400 - 1425	Solving Integration Challenges for Flexible Hybrid Electronics Mr. Rich Chaney, American Semiconductor, Inc.	Rapid Bacterial Pathogen Detection Dr. Sharotka (Xu) Simon, Fluid-Screen
1425 - 1450	Novel Inkjet-Printed Flexible Low-Cost Nanomaterial-Enabled Chemical Sensors Mr. Jimmy Hester, Georgia Institute of Technology	Nanomaterials – Risk Assessment, Safety and Sustainability by Design Prof. Ashok Vaseashta, IASC/ICWI/NUARI
1450 - 1515	Flexible Electrochemical Energy-Storage cYarns™ Dr. Marcio Lima, Lintec of America, Inc.	NanoGRID: A Strategy for Testing the Environmental Consequences of Nanotechnologies Dr. Jonathon Brame, U.S. Army Engineer Research & Development Center
1515 - 1545	Break (Majestic A, B, I)	
Sub-Session 2: Low-Dimensional Electronics		
1545 - 1610	Radiation Effects in Individual CNT FETs: Single Ion Surface Adsorption and Switching Dr. Adam Bushmaker, The Aerospace Corporation	Nanomedicine Measures for the Warfighter Dr. Nicholas Panaro, Leidos Biomedical Research
1610 - 1635	Transitioning Carbon Nanomaterials for Next-Generation Electronics Production Mr. Aaron Sell, Lockheed Martin Space Systems Company	Air Force Environmental Nanomaterial Exposure Sampling, Characterization, and Toxicity Evaluation Mr. Trevor Tilly, 711th Human Performance Wing
1635 - 1700	Advanced Technologies for Carbon Nanotube Property Control at Large Scale Mr. Robert Praino, Chasm Technologies, Inc.	Mesoporous Oxide Nanoparticles for Controlled Release and Targeted Delivery of Antigens for Superior Vaccines and Adjuvants Dr. Eric Carnes, Sandia National Laboratories
1700 - 1725	Induced Energy Band Gap Opening of Low Dimensional Silicon Films Dr. Yan Zhuang, Wright State University	

Wednesday, 18 November 2015			
0700 - 0830	Attendee Continental Breakfast (<i>Colonial Foyer</i>)		
0700 - 1730	Registration Open (<i>Colonial Foyer by Escalator</i>)		
0715 - 0745	Speaker Meeting for Wednesday Presenters (<i>In Room You Are Presenting In</i>)		
0930 - 1900	Exhibits & Posters Open (<i>Majestic A, B, I</i>)		
1155 - 1330	Networking Lunch in the Exhibit Hall - \$12 - Cash Only (<i>Majestic C & D</i>)		
1725 - 1900	Exhibitor & Poster Session Technical Interchange & Reception (Hors d'oeuvres & Cash Bar) (<i>Majestic A, B, I</i>)		
Track One (<i>Colonial A</i>)		Track Two (<i>Colonial B</i>)	Track Three (<i>Cherry Hill</i>)
Nano/Biotechnology: Advanced Materials and Detection Capabilities		Tech Insertion Success Stories	Advanced Coatings & Films
Sub Topic 1: Nano-Enabled Advances in Sensing Session Chairs: Dr. Anthony Esposito, Defense Threat Reduction Agency; Prof. A. T. Charlie Johnson, University of Pennsylvania; and Dr. Natalie Wisniewski, Profusa, Inc.		Session Chairs: Mr. Benji Maruyama, Air Force Research Laboratory; Dr. Edward Silverman, Northrop Grumman Corporation; and Dr. Richard Vaia, Air Force Research Laboratory	Sub-Session 1: Electronic and Optical Coatings Session Chairs: Dr. Kay Blohowiak, The Boeing Company and Dr. Andrey Voevodin, University of North Texas
0800 - 0805	Session Introduction	Session Introduction	Session Introduction
0805 - 0830	Nanomaterials and Devices in Implantable Sensing Applications Dr. Fotios Papadimitrakopoulos, Biorasis, Inc./University of Connecticut	The NNI at 15 - Past Accomplishments and Future Directions Dr. Michael Meador, National Nanotechnology Coordination Office	Nano and Emerging Technologies in Polymers and Coatings Dr. Jamil Baghdachi, Innovative Technical Systems Corp.
0830 - 0855		Mechanical Benefits of VACNT - Reinforcement of CFRP Laminates Mr. Dan Chebot, N12 Technologies	A Novel Nanoimprint Resist for Printable Active Photonic Devices Dr. Keiko Munechika, aBeam Technologies, Inc.
0855 - 0920	In Vivo Nanosensors for Continuous Health Monitoring Dr. Natalie Wisniewski, Profusa, Inc.	Advanced Abrasion Resistant Nanocomposite Coatings Mr. Patrick Lake, Applied Sciences, Inc.	

0920 - 0945	Carbon Nanotubes Based Resistive Sensor for Detection of Chemical and Bio Analytes Prof. Ahmed Busnaina, Northeastern University	The Multifaceted Process of Moving a Technology From Invention to Implementation – With a Focus on Nanocopper Based Electronic Interconnect Technology Dr. Susan Ermer, Lockheed Martin Space Systems Company	
0945 - 1015	Break (Majestic A, B, I)		
Sub Topic 1: Nano-Enabled Advances in Sensing, cont.		Tech Insertion Success Stories, cont.	Sub-Session 2: New Concepts in Coatings and Test Methods Session Chairs: Dr. Kay Blohowiak, The Boeing Company and Dr. Andrey Voevodin, University of North Texas
1015 - 1040	Ultrathin Silk Fibroin Films with Incorporated Antimicrobial Peptides for Improved Biological Agent Discriminatory Sensors Dr. Joshua Uzarski, U.S. Army Natick Soldier RD&E Center	Reframing Designs as a Strategy to Accelerate Innovations: Case Study in NanoTechnology Innovation Dr. Edward Silverman, Northrop Grumman Aerospace Systems	Graphene Enabled Technologies for Defense Applications Mr. Ian Fuller, Angstrom Materials, Inc.
1040 - 1105	Improving Immunoassay Sensitivity with Upconverting Nanoparticles (UCNPs) Dr. Jeff Ballin, U.S. Army Edgewood Chemical Biological Center (Excet, Inc.)	Nanostructured Thermal Interfaces for Cooling Aerospace Platforms Dr. Jesse Tice, Northrop Grumman Aerospace Systems	Polymeric Gradient Integrated Layer Films and Coatings Dr. Jamil Baghdachi, Innovative Technical Systems Corp.
1105 - 1130	Surface-Enhanced Raman Scattering (SERS) Immunoassay Based on the Filtration of Antigen-Assembled Gold Nanoparticles Dr. Jeremy Driskell, Illinois State University	Nanostructured Materials: From the Labs of MIT to Commercial Mass Production Dr. Bob Hilty, Xtalic Corporation	Adhesion Testing of Thin Films Using Acoustic Microcavitation Mr. Jeffrey Hicks, Uncopiers, Inc.
1130 - 1155	Sensitive Detection of Chemical Agent Simulants Using a Graphene Based Optical Sensor Dr. Ashok Maliakal, LGS Innovations	Nanosilicon Enabled High-Speed Gas Chromatograph Dr. Joshua Whiting, APIX Analytics	Conductive Polymer Additives in Coatings and Composites Ms. Volha Hrechka, PolyDrop, LLC
1155 - 1330	Networking Lunch in the Exhibit Hall - \$12 - Cash Only (Majestic C & D)		

Track One (Colonial A)		Track Two (Colonial B)	Track Three (Cherry Hill)
Nano/Biotechnology: Advanced Materials and Detection Capabilities, cont.		Power & Energy Generation	Advanced Coatings & Films, cont.
Sub Topic 2: Biomaterials for Defense Applications Session Chairs: Dr. Jennifer Weisman, Strategic Analysis, Inc. and Dr. Natalie Wisniewski, Profusa, Inc.		Session Chairs: Prof. Jonathan Claussen, Iowa State University and Dr. Benjamin Leever, Air Force Research Laboratory	Sub-Session 3: Coatings for Control of Surface Energy Session Chairs: Dr. Jamil Baghdachi, Innovative Technical Systems Corp. and Dr. Michael Weibel, JRAD, Inc.
1330 - 1335	Session Announcements	Session Introduction	Session Announcements
1335 - 1400	3D Printed Bionic Nanomaterials Prof. Michael McAlpine, University of Minnesota	High Performance Organic-Inorganic Hybrid Perovskite-Based Solar Cell Dr. Gang Li, University of California, Los Angeles	Waterproofing of Printed Circuit Boards and Electronic Components Using Nanomaterial Coatings for Microelectronics Mr. Patrick Tang, Aculon, Inc.
1400 - 1425	Targeted Delivery of Antibiotics to Cells Infected with <i>Burkholderia Pseudomallei</i> Using Mesoporous Silica Nanoparticle-Supported Lipid Bilayers Dr. Carlee Ashley, Sandia National Laboratories	Understanding the Role of Organic Alloys in Polymer-Fullerene Solar Cells Prof. Barry Thompson, University of Southern California	Multifunctional Surface Coatings Dr. Timothy Lawton, U.S. Army Natick Soldier RD&E Center
1425 - 1450	Development and Application of Pressure Responsive Bio-Nano Hybrid Materials Towards TBI Analysis Dr. Abby West, U.S. Army Research Laboratory	Benergy Advanced Coating and Films Mr. Glenn Mesa, Benergy, LLC	Advantages of Omniphobic Coatings for Chemical-Biological Suit Protection Dr. Natalie Pomerantz, U.S. Army Natick Soldier RD&E Center
1450 - 1515	Convergent Evolution to Engineering: Multi-Functional Bio-Composite and Biomimetic Materials Prof. David Kisailus, University of California Riverside	Nanotechnology for Energy Conversion and Power Generation Dr. Deryn Chu, U.S. Army Research Laboratory	Nanomanufacturing for Durable Superhydrophobic/Icephobic Coatings Dr. Joey Mead, University of Massachusetts Lowell
1515 - 1545	Break (Majestic A, B, I) - Votes are Due for Best Poster		

Track One (<i>Colonial A</i>)		Track Two (<i>Colonial B</i>)	Track Three (<i>Cherry Hill</i>)
Sub Topic 3: Human Health and Performance Monitoring Session Chairs: Dr. Anthony Esposito, Defense Threat Reduction Agency and Dr. Jennifer Weisman, Strategic Analysis, Inc.		Power & Energy Generation, cont.	Sub-Session 4: Corrosion and Protective Coatings Session Chair: Dr. Jamil Baghdachi, Innovative Technical Systems Corp. and Dr. Michael Weibel, JRAD, Inc.
1545 - 1610	Plasmonic Paper: Toward Detection of Human Performance Biomarkers Dr. Abrin Schmucker, National Research Council	Very Thin, Reliable, High Specific Power Multi-Junction Solar Cells Dr. Paul Sharps, SolAero	Corrosion-Resistant AR Coating of High Energy Alkali Laser Components Using Refractory Materials Dr. Zsolt Marton, Radiation Monitoring Devices, Inc.
1610 - 1635	Human Cognition Biomarker Sensor Using Peptide Functionalized Nanotransistor Dr. Steve Kim, Air Force Research Laboratory	Macroscale and Microscale High Power Lithium-Ion Batteries Prof. Paul Braun, University of Illinois at Urbana-Champaign	Environmentally Friendly Corrosion Protection Mr. Valentin Ryabov, Advenira Enterprises, Inc.
1635 - 1700	Electronic Olfaction System for Detection of Volatile Organic Compounds in Human Samples Prof. Charlie Johnson, University of Pennsylvania	Atomistic Modeling of Nonlinear Nano-Dielectrics for High Power Microwave (HPM) Applications Dr. Renee Van Ginhoven, Air Force Research Laboratory	Environmental Testing of Nanoscale, Antireflective Surface Structures on Windows for High Energy Laser Systems Dr. Jesse Frantz, Naval Research Laboratory
1700 - 1725	A NANOeSPRI-Based IVD Assay for Multiple Organ Injury Dr. Siqi Li, Luna Innovations, Inc.	Bio-Derived Energetic Nanomaterials Dr. Joseph Slocik, Air Force Research Laboratory	Novel Industrial Coatings Using Discrete Functionalized Multiwall Carbon Nanotubes Mr. Chad Lewis, MW2 Defense, LLC
1725 - 1900	Exhibitor & Poster Session Technical Interchange & Reception (Hors d'oeuvres & Cash Bar) (<i>Majestic A, B, I</i>)		
Thursday, 19 November 2015			
0700 - 0830	Attendee Continental Breakfast (<i>Colonial Foyer</i>)		
0700 - 1530	Registration Open (<i>Colonial Foyer by Escalator</i>)		
0715 - 0745	Speaker Meeting for Thursday Presenters (<i>In Room You Are Presenting In</i>)		

1155 - 1330	Lunch Break (<i>On-Your-Own</i>)	
1700 - 1900	NT4D Happy Hour – Starter Appetizers Provided (<i>Red Patio</i>) (Jazz & Blues by the Gerry Rothschild Band starting at 1830)	
Track One (<i>Colonial A</i>)		Track Two (<i>Colonial B</i>)
Nanostructured Materials: 1-D, 2-D, and Metamaterials Session Chairs: Dr. Wade Adams, Rice University and Dr. Paul Sheehan, Naval Research Laboratory		Advanced Manufacturing/Nanomanufacturing Session Chairs: Dr. Khershed Cooper, National Science Foundation; Dr. Kathy Duncan, U.S. Army CERDEC; Dr. Joey Mead, University of Massachusetts Lowell; Dr. Jim Murday, University of Southern California; Ms. Laura Rea, Air Force Research Laboratory; and Prof. Mark Tuominen, University of Massachusetts Amherst
0800 - 0805	Session Introduction	Session Introduction
0805 - 0830	Keynote Lecture – Low-Dimensional Carbon and Beyond, Computational Exploration Dr. Boris Yakobson, Rice University	Power Electronic NNMI Mr. Nick Justice, North Carolina State University
0830 - 0855		DARPA Atoms to Product Program Dr. John Main, DARPA/DSO
0855 - 0920	Controlling Graphene Growth via Substrate Engineering Mr. Travis Tumlin, U.S. Army Research Laboratory	Establishment, Vision, and Success Stories from America Makes Dr. Benjamin Leever, Air Force Research Laboratory
0920 - 0945	Graphene Molecules: Synthesis, Electronic Properties and Applications Dr. Milan Sykora, Los Alamos National Laboratory	Functional Hybrid Materials via Self-Assembly and Nanoimprint Lithography: Towards Solution-Based Nanomanufacturing Dr. James Watkins, University of Massachusetts Amherst
0945 - 1015	Break (<i>Colonial Foyer</i>)	
1015 - 1040	Autonomous Experimentation Applied to Carbon Nanotube Synthesis Mr. Benji Maruyama, Air Force Research Laboratory	cSilk™: A Carbon Nanotube Template for Production of Conformal Nanotube Coatings, Composite Yarns and Sheets Dr. Marcio Lima, Lintec of America, Inc.
1040 - 1105	Fabrication of Microcellular 3-D Graphene Foams with Nickel Templates Dr. Wei Li, The University of Texas at Austin	High-Rate Manufacturing of Polymer Nanocomposites and Highly-Filled Systems Dr. Carol Barry, University of Massachusetts Lowell
1105 - 1130	A Theoretical Consideration of the Ballistic Response of Continuous Graphene Membranes and Other Two-Dimensional Polymers Dr. Eric Wetzel, U.S. Army Research Laboratory	Direct 3D Optical Printing of Piezoelectric Polymer Nanocomposites Dr. Donald Sirbuly, University of California - San Diego
1130 - 1155	Atomistic Simulation of a Two-Dimensional Polymer Tougher Than Graphene Dr. Emil Sandoz-Rosado, U.S. Army Research Laboratory	Light-Weight Conductive Plastic for Fused Deposition Modelling (FDM) Printing Enabled by Nanomaterials Dr. Paul Kladitis, University of Dayton Research Institute

1155 - 1330	Lunch Break (On-Your-Own)	
	Track One (Colonial A)	Track Two (Colonial B)
	Nanostructured Materials: 1-D, 2-D, and Metamaterials, cont.	Advanced Manufacturing/Nanomanufacturing, cont.
1330 - 1335	Announcements	Announcements
1335 - 1400	Ultra-Strong Ultra-Tough Biomimetic Platelet-Matrix Composites: Universal Composition-Structure-Property Maps Prof. Rouzbeh Shahsavari, Rice University	NanoCopper Based Electronic Interconnect Technology Dr. Alfred Zinn, Lockheed Martin Space Systems Company, Advanced Technology Center
1400 - 1425	Microwave Induced Welding of Carbon Nanotube-Thermoplastic Interfaces for Enhanced Mechanical Strength of 3D Printed Parts Mr. Brandon Sweeney, Texas A&M University	Development of NiZn Ferrite Nanoparticle Composite Filaments for Additively Manufactured Radio Frequency Structures Dr. Katherine Duncan, U.S. Army CERDEC
1425 - 1450	Thermoacoustic Sound Projector: Efficiency and Power Consideration Dr. Ali Aliev, University of Texas at Dallas	Nanoscale Offset Printing System (NanoOPS) for Additive Printing of Devices and Structures for Electronics, Sensors, and Advanced Materials Applications Using 0D, 1D and 2D Nanomaterials Prof. Ahmed Busnaina, Northeastern University
1450 - 1520	Break (Colonial Foyer)	
1520 - 1545	Printing and Annealing Graphene-Based Inks on Flexible, Degradable Substrates for Electrochemical Biosensing Prof. Jonathan Claussen, Iowa State University	Bottom-Up Assembling of Rotary Micromotors with Ultrahigh Performance for Bioapplications Dr. Donglei Fan, The University of Texas at Austin
1545 - 1610	Functionalized Nanocomposite Energetics for Explosives, Propellants and Pyrotechnics Dr. Girish Srinivas, TDA Research, Inc.	
1610	Conference Adjourns	
1700 - 1900	NT4D Happy Hour – Starter Appetizers Provided (Red Patio) (Jazz & Blues by the Gerry Rothschild Band starting at 1830)	
Friday, 20 November 2015		
0930 - 1200	Jet Propulsion Laboratory Tour (Transportation On-Your-Own)	

Poster Session

Poster Session Chairs: Dr. Akbar Khan, Defense Threat Reduction Agency and Dr. Revell Phillips, Defense Threat Reduction Agency

The NanoTechnology for Defense Conference Poster Session has a superb array of presentations located in the Majestic Ballroom. Posters are organized by sub-session and listed alphabetically by the author's 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."

Advanced Coatings & Films

- **Durable Transparent Hydrophobic Coatings**, Dr. Bryan Koene, Luna Innovations, Inc.

Advanced Manufacturing/Nanomanufacturing

- **Advanced Manufacturing Process for Producing Continuous Nanofiber Yarns**, Dr. Alexis Carpenter, AxNano, LLC
- **Process Innovations for the Manufacture of Nanostructured Aerospace/Defense Forgings**, Dr. Edward Chen, Transition45 Technologies, Inc.
- **Ionothermal Synthesis of Lanthanide Tetrafluoride Nanoparticles Using Deep Eutectic Solvents**, Dr. Benjamin Furman, Southwest Research Institute
- **Experimental and Numerical Study of Selectively Reinforced Polymer Nanocomposites**, Dr. Ahmed Khattab, University of Louisiana at Lafayette
- **Novel Functional Photonic Devices Made via Nanoimprint Lithography with High Refractive Index Resist**, Dr. Keiko Munechika, aBeam Technologies, Inc.
- **Advanced Carbon-Based Materials and Integrated Fabrication Enabling Printed Electronics and Device Applications**, Dr. Wu-Sheng Shih, Brewer Science, Inc.
- **Development of Inherently Super-Nonwetting Fibers and Fabrics**, Mr. Quoc Truong, U.S. Army Natick Soldier RD&E Center
- **Fluid Phase Processing of Carbon Nanotubes for Production of Advanced EMI Shielding Materials**, Dr. Dmitri Tsentlovich, DexMat, Inc.

Nano/Biotechnology: Advanced Materials and Detection Capabilities

- **Reconfigurable DNA Nanostructures for Modulating FRET Pathways**, Dr. Susan Buckhout-White, Naval Research Laboratory
- **Monitoring Warfighter Performance with Printed Graphene Sweat Biosensors**, Prof. Jonathan Claussen, Iowa State University
- **The Functionalized Nanopore Detection (FiND) Platform for Target Analyte Detection and Quantification**, Dr. Eric Ervin, Electronic BioSciences, Inc.
- **Location Deterministic Biosensing from Quantum-Dot-Nanowire Assemblies**, Dr. Donglei Fan, The University of Texas at Austin
- **Nanomechanical Characterization of Bacillus Anthracis Spores Using Atomic Force Microscopy**, Dr. Alex Li, Air Force Institute of Technology
- **A NANOeSPRi-Based IVD Assay for Multiple Organ Injury**, Dr. Siqi Li, Luna Innovations, Inc.
- **Hybrid Plasmonic/Semiconductor Nanoparticles for Imaging and Photoablation**, Dr. Anton Malko, The University of Texas at Dallas
- **Photochemically Synthesized Silver Nanostructures for Surface Enhanced Raman Sensing of Bacteria and Explosives**, Mr. Mauricio Rojas-Andrade, University of California Santa Cruz
- **Fabrication and Characterization of Low Modulus Bio-Electrodes**, Dr. Girish Srinivas, TDA Research, Inc.
- **Detecting VOCs Using Doped Electrospun Fibers Based Sensing Platforms**, Prof. Ashok Vaseashta, IASC/ICWI, NUARI
- **Stabilization of Nucleic Acids through Adsorption by Nanostructured Materials**, Dr. Brandy White, Naval Research Laboratory
- **Graphene-Based Chemical Sensor with Sub-PPB Sensitivity**, Dr. Yan Zhuang, Wright State University

Nanostructured Materials: 1-D, 2-D, & Metamaterials

- **High Pressure, Nano-Energetic Ignition Torch Applied to Subscale Test Rocket Engines**, Dr. Alireza Badakhshan, Air Force Research Laboratory (ERC, Inc.)
- **High Thermal Conductivity Gaskets Based on Carbon Nanotube Vertical Arrays**, Mr. Matthew Craps, NanoTechLabs, Inc. (UNCG)
- **Quantification of the Effects of Modified Multi-Walled Carbon Nanotubes on Model Crosslinked Epoxy-Amine Coating Characteristics**, Mr. Greg Curtzwiler, The University of Southern Mississippi

- **Engineering Surfaces with 2D Materials**, Dr. Paul Sheehan, Naval Research Laboratory
- **Scalable Productions of Pristine, Few-Layered Graphene Nanoplatelets and other 2D Nanomaterials by Shear Exfoliation**, Mr. Charles Van Fleet, Swan Chemical, Inc.

Next Generation Electronics

- **Modeling Kinetics in Nanoelectronics Devices Using the Atomistic ToolKit**, Dr. Samuel Chill, Atherton Quantum Insight
- **Memristive Granular Structures Under Electrical and Mechanical Stimuli**, Dr. Alex Li, Air Force Institute of Technology
- **Advanced Deposition and Characterization Techniques for Enabling Future III-V Semiconductor Devices**, Mr. Antonio Lucero, The University of Texas at Dallas
- **Highly Sensitive Low-Loss Micro-Passives Using 3D Printed Silver Nanoparticles - Fabrication, Modeling and Characterization**, Mr. Arya Rahim, Washington State University

Power & Energy Generation

- **Nanosilicon: Production and Applications**, Dr. David Irvin, Systems & Materials Research Corporation
- **Safety with Performance: Breakthroughs in Solid Polymer Electrolyte Systems**, Mr. Chad Lewis, MW2 Defense, LLC
- **Flexible Graphene Liquid Metal Devices**, Mr. Richard Ordonez, Space and Naval Warfare Systems Center Pacific
- **Flat Ceramic Nanoparticles with Two Functionally Different Surfaces for Self-Generating Coatings**, Dr. Pavlo Rudenko, TriboTEX
- **Bio-Derived Energetic Nanomaterials**, Dr. Joseph Slocik, Air Force Research Laboratory

Safety & Health

- **Aerosol Sampling, Characterization, and Toxicity Evaluation of Nanomaterials Released in Air Force Environments**, Mr. Trevor Tilly, 711th Human Performance Wing

Sustainment & Sustainability

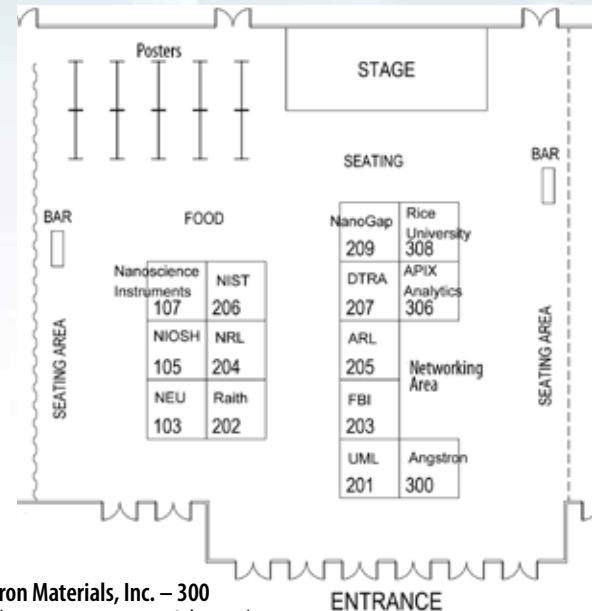
- **Through-Process Modeling of Cold Spray Processing for Repair Applications**, Dr. Danielle Cote, Worcester Polytechnic Institute
- **Experimental Characterization for Through-Process Modeling of Cold Spray Aluminum Alloys**, Ms. Baillie McNally, Worcester Polytechnic Institute

Exhibit Show & Poster Hours

Monday: 1700 - 1830
 Tuesday: 1200 - 1600
 Wednesday: 0930 - 1900

Exhibit Show Floor Plan

Majestic A, B, I



Angstrom Materials, Inc. – 300
<http://www.angstrommaterials.com/>

Angstrom Materials, the world's largest producer of graphene materials, specializes in helping companies engineer graphene solutions for their applications. We are focused on 6 areas: Raw Materials, Energy Storage, Thermal Management, Nanocomposites, Coatings, and TCFs. We have the expertise to partner with customers throughout the commercialization process from initial evaluation to market launch.

Exhibit Show

APIX Analytics – 306

<http://www.apixanalytics.com/>

APIX Analytics is the leader in nano-silicon sensor technology. We offer an array of GC-NEMS-TCD based systems for rapid chemical analysis in petrochemical, environmental, and security applications. All of our systems use a modular approach for easy maintenance and modification in a variety of operational environments offering solutions for use in laboratory, field, and explosive environments.

Defense Threat Reduction Agency (DTRA) J9CB – 207

<http://www.dtra.mil/>

The Chemical and Biological Technologies Department is the Defense Threat Reduction Agency's epicenter for chemical and biological threat expertise. We are also dual-hatted as the Joint Science and Technology Office for Chemical and Biological Defense under the DoD Chemical and Biological Defense Program. In this role we provide cutting edge technology solutions to reduce the threat from weapons of mass destruction and empower warfighters to achieve their missions in a chemical or biological environment. In addition, we have a dual responsibility of protecting against the known threats of today, as well as anticipating the major threats of tomorrow. We are leading the development of innovative scientific and technical advances that protect our warfighters and benefit the nation's private sector.

FBI - Los Angeles Field Strategic Partnership Program – 203

<http://www.fbi.gov/about-us/investigate/counterintelligence/strategic-partnerships/>

The FBI Strategic Partnership Program (SPP) is an initiative that aims to foster communication and build awareness of counterintelligence threats facing the U.S. business and academic communities. The SPP works to identify and safeguard those technologies which, if compromised, would severely damage U.S. national security and economic interests. Through the partnerships, the FBI is able to provide security related training, as well as provide the tools and experience to identify and mitigate threats.

NANOGAP, Inc. – 209

<http://www.nanogap-usa.com/>

NANOGAP is a nanomaterials company built on a technology platform of precisely controlled wet chemistry. A range of novel, high-performance nanomaterial dispersions are currently manufactured, including sub-nanometer atomic quantum clusters (AQCs), nanoparticles (from 5 to 50 nanometers in size), and high aspect ratio nanowires. NANOGAP's products have a wide range of applications, including conductive inks, security printing, catalysis, antimicrobials, diagnostics and therapeutics.

Nanomanufacturing Center, University of Massachusetts Lowell – 201

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

The Nanomanufacturing Center at UMass Lowell develops state-of-the-art

Exhibit Show

nanomanufacturing processes for high-rate, high-volume production of nano-enabled polymer materials. Applications include rubber and polymer nanocomposites, substrates for flexible electronics, novel filaments for 3D printing, sensors, biosensors, metamaterials, and nanomedicine. Concurrent evaluation of EHS for manufacturing process is also considered.

Nanoscience Instruments – 107

<http://www.nanoscience.com/>

Nanoscience Instruments provides surface science, microscopy and nanotechnology solutions to customers in academia, research, and industrial markets. Our customers benefit from our products' ease of use, user-friendly interface, and low cost of ownership. Our team of scientists and engineers have backgrounds in chemistry, biochemistry, materials science, physics, and engineering in a diverse combination to provide support and service to help our customers find the solutions they need.

NIOSH – 105

<http://www.cdc.gov/niosh>

NIOSH is the leading federal agency conducting research and providing guidance on the occupational safety and health implications and applications of nanotechnology.

NIST/CNST – 206

<http://www.nist.gov/>

The NIST Center for Nanoscale Science and Technology (CNST) supports the U.S. nanotechnology enterprise from discovery to production by providing industry, academia, NIST, and other government agencies with access to world-class nanoscale measurement and fabrication methods and technology. The CNST's shared-use NanoFab gives researchers economical access to and training on a state-of-the-art tool set required for cutting-edge nanotechnology development. The simple application process is designed to get projects started in a few weeks. Looking beyond the current state of the art, CNST research is creating the next generation of nanoscale measurement instruments and methods, which are made available through collaboration.

Northeastern University - Center for High-Rate Nanomanufacturing – 103

<http://www.nanomanufacturing.us/>

The NSF 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. The CHN has close ties with companies in Massachusetts, California, around the country, and beyond.

Exhibit Show

Raith – 202

<http://www.raith.com/>

Raith is a leading precision technology solution provider for nanofabrication, electron beam lithography, focused ion beam fabrication, nanoengineering and reverse engineering applications. Raith has an established, world-wide network of dedicated scientists and engineers which serve customers from virtually every field of study, from academia and industry. It has the largest support infrastructure within the nanofabrication business field worldwide.

Rice University – 308

<http://www.rice.edu/>

Rice University is a leader in Advanced Materials Science and Engineering and a frequent research collaborator with the DoD (all Services), the DOE, Homeland Security and numerous defense and aerospace contractors. Rice, with leadership from Nobel Laureates Richard Smalley and Robert Curl, helped establish the field of carbon nanotechnology, and expanded from there to multiple applications of nanotechnology to health, energy, aerospace and information technology, with advanced materials playing a role in all of these arenas.

U.S. Army Research Laboratory – 205

<http://www.arl.army.mil/>

The U.S. Army Research Laboratory is the Nation's premier laboratory for land forces, responsible for researching emerging and new technologies and for developing disruptive technologies capable of enhancing the performance of weapon systems and saving Soldiers' lives. The exhibit will feature some of the disruptive technologies being pursued at ARL.

U.S. Naval Research Laboratory – 204

<http://www.nrl.navy.mil/>

The U.S. Naval Research Laboratory provides primary in-house research for the physical, engineering, space and environmental sciences; broadly based applied research and advanced technology development programs in response to identified and anticipated Navy and Marine Corps needs; broad multidisciplinary support to the Naval Warfare Centers; and space systems technology development and support.

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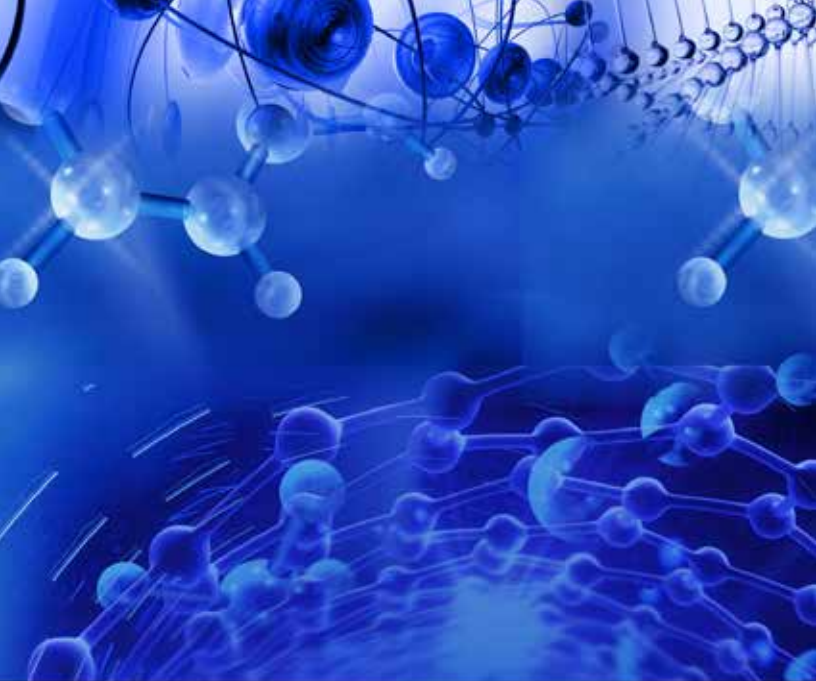
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