



San Antonio
Nano Technology Forum

Inaugural Conference

October 18, 2012



Conference Host/Sponsor

www.santf.net

SANTF MISSION

The mission of San Antonio Nanotechnology Forum is to accelerate emerging technology commercialization by establishing a forum that encourages networking and collaboration opportunities for researchers, innovators, entrepreneurs, and companies working in the area of nanomaterials and nanotechnology in the Greater San Antonio.

SANTF OBJECTIVES

- Identify the nanotechnology personnel and infrastructure in Greater San Antonio area.
- Form a nanotechnology network to increase the awareness of nanotechnology education/careers in San Antonio community schools.
- Organize meetings on a semi-annual basis to promote research ideas, provide updated collaborative opportunities, identify industry training requirements, and present job training/employment opportunity information to students seeking employment in the area of nanotechnology.
- Organize nanotechnology “shared facilities”
- Promote research collaborations.

SANTF BENEFITS

- Promote innovations leading to scientific discoveries, engineering innovations resulting in commercially viable nano-products.
- Enhances San Antonio’s nanotechnology future and establishing San Antonio as a global leader in nanotechnology.

Program Schedule

08:30 – 09:00

Registration and Continental Breakfast

9.00 AM – 10.20 AM

Session I:

Session Chair:

Inauguration of the Forum, Welcoming Remarks

**Dr. Jimmie Bruce, Vice President, Academic Affairs,
Northwest Vista College**

Opening remarks, Rey A. Saldaña, City Council Member,
District 4, City of San Antonio

Program Over view: Dr. Madhavrao Govindaraju, SAI
Global Technologies, Inc.

Welcoming remarks, Dr. Jacqueline Claunch, President,
Northwest Vista College

Welcoming Remarks, Dr. Mauli Agrawal, Dean, College of
Engineering, UTSA

09:20 – 09:50

Thinking Big on a Small Scale

Robert K. Ehrmann, NSF National Center for Nanotech
nology Applications and Career Knowledge (NACK) Net
work, Pennsylvania State University

09:50 – 10:20

The Key to Future Success is Thinking Small, Dr. John
J. Grillo, Chair, Academic Workforce Programs, North
west Vista College

10:20 – 10:50

Coffee & Networking Break

10.50 AM – 12.15 PM:

Session Chair:

**Session II: Status of Nanotechnology Research in San
Antonio**

**Dr. Les Shephard, Director, Texas Sustainable
Energy Research Institute, UTSA**

11:00 – 11:25

**Overview of Nanotechnology Research at the Univer
sity of Texas Health Science Center at San Antonio
(UTHSCSA), Dr. Glickman, UTHSCSA.**

- 11:25 – 11:50 **Overview of Nanotechnology Research at Southwest Research Institute (SwRI),**
Dr. Kent Coulter, Materials Engineering Department, SwRI.
- 11:50 – 12:15 **Overview of Nanotechnology Research at the University of Texas at San Antonio (UTSA),** Dr. Miguel Yacaman, Department of Physics and Astronomy, UTSA.
- 12:15 – 13:15 **Luncheon talk: Introduction to Nanotechnology,** Dr. Dominick E. Fazarro, University of Texas at Tyler, Tyler, Texas.

13.15 PM – 15.15 PM:

Session III: Technology, Applications, Product Development and Commercialization

Session Chair: **Dr. Cory Hallam, Chief Commercialization Officer, Office of the Commercialization and Innovation, UTSA**

13:15 – 13:40 **“Preventing and Treating Combat Related Infections”,** Dr. Mauris DeSilva, Naval Medical Research Unit, Fort Sam Houston

13:45 – 14:10 **“A Global Strategy for Nanotechnology Commercialization: Connecting Innovators, Investors, and Educators”,** Dr. Walt Trybula, Texas State University, San Marcos

14:15 – 15:15 **Technology Panel: Highlights of Nanotechnology Research in Greater San Antonio area – Panel Members: Dr. Chonglin Chen, Department of Physics and Astronomy, UTSA, Dr. James D. Oxley, Microencapsulation & Nanomaterials Department, SwRI; Dr. Amar Bhalla, Department of Electrical Engineering, UTSA.**
Moderator: Dr. Vicky Poenitzsch, Materials Engineering Department, SwRI.

15:15 – 15:45 **Coffee & Networking Break**

15:45 – 16:45 **Investor/Industry Panel: Path to commercialization of Nanotechnology –Panel Members: Dr. John Bruno, Operational Technologies Corporation, Adrian G. Perez, Economic Development Manager, Economic Development Department, City of San Antonio, Jim Poage, President and CEO, Startech, San Antonio; Andrew Trickett, San Antonio Clean Energy Incubator (UTSA), Jamie Rhodes, Central Texas Angel Networks.**
Moderator: Dr. Walt Trybula, Texas State University,

16:45 – 17.15

**Organizers' Panel: San Antonio Nano Technology Forum
– the Future**

Closing Remarks – Dr. Walt Trybula, Texas State University,
San Marcos.

ABSTRACTS OF THE INVITED PRESENTATIONS

09:20 – 09:50

Thinking Big on a Small Scale; Robert K. Ehrmann, NSF National Center for Nanotechnology Applications and Career Knowledge (NACK) Network, Pennsylvania State University

Nanotechnology is playing a key role in this, the next industrial revolution. It is not an industry; it is an enabling technology that is impacting almost every employment sector from electronics, biotechnology, biomedicine, pharmaceuticals, textiles, agriculture, food production, printing and publishing, plastics, metals, information technology, building and construction materials, recreation, and many others. How effectively companies in these industries utilize nanotechnology in the years ahead will be crucial to their competitiveness.

The demand for people with nanotechnology related skills is on the rise and one estimate puts this need for nano-literate workers at approximately 2 million by 2020. In order to fulfill these current and future needs, it is imperative that educational institutions across the country tackle this nano-awareness challenge. In response to industry needs, nanotechnology courses and degree programs are emerging at many community/technical colleges and baccalaureate institutions across the US and around the world.

The Nanotechnology Applications and Career Knowledge (NACK) NSF ATE National Center is a working, productive nanotechnology workforce development network involving research universities and community and technical colleges across the US. The objectives of this partnership are (1) enhanced national coordination of the development, availability, and dissemination of high quality micro-nanofabrication workforce educational resources, programs and activities and (2) enhanced growth of the US nanotechnology manufacturing workforce. (see www.nano4me.org)

09:50 – 10:20

The Key to Future Success is Thinking Small, Dr. John J. Grillo, Chair, Academic Workforce Programs, Northwest Vista College

Dr. Grillo will be discussing emerging job opportunities in the Nanotechnology industry, to include projected growth in Nano-related jobs over the next several years. In addition, an brief overview of all Associate of Applied Science Degrees offered by Northwest Vista College will be given. Dr. Grillo will recognize the Nanotechnology program here at Northwest Vista College to include the success of recent student graduates and job, transfer, and research opportunities for those interested in Nanotechnology related careers.

11:00 – 11:25 Overview of Nanotechnology Research at the University of Texas Health Science Center at San Antonio (UTHSCSA), Dr. Randolph Glickman, UTHSCSA.

Nanotechnology, a term that covers the use of submicroscopic particles composed of metallic or polymeric materials, as well as applications dependent on the nanoscale structure of materials, is impacting biomedicine by providing novel materials for tissue replacement, nanoscale platforms for biosensors and diagnostic tests, contrast agents for various imaging modalities, and innovative drug delivery vehicles. Metallic nanoparticles in particular may also find special use in applications involving laser and other optical medical applications, because of their extensive repertory of photonic interactions. In order to illustrate some of the nanotechnology biomedical applications being developed at the UT Health Science Center in San Antonio, I will showcase the work ongoing in three laboratories: Dr. Mark Feldman's group (Dept of Medicine/ Div. of Cardiology) – imaging and drug delivery; Dr William Phillips' and Dr. Beth Goins' group (Dept. of Radiology) – imaging, drug delivery, and cancer therapy, and my own group in the Department of Ophthalmology – biosensing, diagnostics, and imaging.

11:25 – 11:50 Overview of Nanotechnology Research at Southwest Research Institute (SwRI), Dr. Kent Coulter, SwRI.

The solution for many technological problems lies in the novel development and application of micro and nanotechnology in materials development. Specific examples include sensors that can survive extreme environments, catalysts to improve properties, coatings to reduce erosion by improving tribological properties, non-metal radiation shielding, and biomedical devices for uses, such as targeted drug delivery. Southwest Research Institute (SwRI) is developing new materials such as silicon clathrates, graphene, amorphous metals, and nanocomposites using production scaleable nanotechnology. The design considerations, fabrication processes, and materials properties utilized at SwRI in the application of these unique materials for battery electrodes, PEM fuel cells, hydrogen storage, hydrogen and CO₂ separation membranes, corrosion/erosion protection of lightweight structures, and high conductivity wires and sheets will be briefly discussed.

11.50—12.15 Overview of Nanotechnology Research at the University of Texas at San Antonio, Dr. Miguel José-Yacamán, Physics Department, University Of Texas at San Antonio

Modern electron microscopy has achieved an old dream to break the 1 Å resolution barrier. Indeed microscopes such as the ARM in UTSA have a resolution of 0.8 Å (80 pm) that can be achieved in a routine basis. Our microscope was the number one in the world until recently the DOE center at Berkeley achieved 0.5 Å resolution. In real terms, since the size of the atom is in that range (He atom is 40 pm), it means that that is the resolution that can be achieved. Below this limit, nuclear interactions and other phenomena will dominate.

Therefore, a natural question emerges. What is the future of electron microscopy? It can be say that from now on all the improvements will be not in resolution but in other areas. In this talk we will review the most significant areas of nanotechnology that demand significant improvements in electron microscope techniques. Some examples are the need of more accurate in-situ experimentation and measurements, single electron detection, and the need of low voltages among others will be discussed.

12:15 – 13:15 Luncheon talk: Introduction to Nanotechnology, Dr. Dominick E. Fazarro, University of Texas at Tyler, Tyler, Texas.

Introducing students to the imaginable possibilities of nanotechnology. The presentation will cover, the definition, workforce implications, uses of nanotechnology in society, programs to educate students. The students will also take a trip into the year 2040 to discover where nanotechnology is commonplace in society. Students!!! Hold on!!! and enjoy the adventure as I take you into the “Nanozone”.

13:15 – 13:40 “Preventing and Treating Combat Related Infections”, Dr. Mauris DeSilva, Naval Medical Research Unit, Fort Sam Houston, San Antonio.

Polytrauma is a major concern for the military because many warfighters experience multiple traumatic injuries at the same time. Complications of polytrauma require providing personalized medical care to enhance the prevention and treatment of infection of warfighters. Personalized medical technology has become a high priority in the military. Research initiatives are multidisciplinary in nature and require a multidisciplinary approach. Polytrauma was commonly seen during Operations Iraqi Freedom and Enduring Freedom due to increased use of improvised explosive devices against coalition troops. Furthermore, these injuries are also common in the civilian community most often as a result of motor vehicle accidents. New personalized medical technologies developed will improve outcomes for warfighters as well as help the civilian communities.

In this invited speech, I will describe how scientists at NAMRU-SA are planning to address one of the research challenges in developing medical nanotechnology associated with maxillofacial, head, and neck regions. Specifically, how we are planning to develop personalized medical technology for infection control associated with traumatic head injuries where maxillofacial reconstruction is required due to massive tissue damage.

Acknowledgements: This work was funded under work units G1009 and G1026 at the Naval Medical Research Unit San Antonio, Fort Sam Houston, Texas.

13:45 – 14:10 “A Global Strategy for Nanotechnology Commercialization: Connecting Innovators, Investors, and Educators”, Dr. Walt Trybula, Texas State University, San Marcos.

As nanotechnology has developed, the “hype” has diminished but the potential is still developing. There are many promising developments world-wide in med-bio along with numerous materials innovations. In order to create and develop a successful business, innovators need support from investors and a workforce capable of supporting the research, development, and production of the “product”. One major issue is that each of these types speaks a different technical/business language. Coupling the different approaches with global regulatory restrictions creates a challenge to developing a strategy that satisfies all expectations. An overview of these differences and how to address them will provide a starting point for creating a successful business.

Conference Host



ALAMO
COLLEGES

NORTHWEST VISTA COLLEGE

The Nanotechnology program at Northwest Vista College will prepare students for careers in emerging nanotechnology industries as entry-level nanotechnicians in research and development corporations, nanofabrication, nanobiology/agriculture, nanomedicine, nanoelectronics, and nanomaterials. If you are interested in learning more about nanotechnology, a fundamental course of "[*NANO1301--Introduction to Nanotechnology*](#)" is highly recommended.



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The SANTF Conference is partially supported by NSF Grant: **NVC Project ION (Improving Opportunities for Nanotechnology)** with Grant number: **1205010**

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The College of Science and Engineering prepares undergraduate and graduate students for careers in the natural and physical sciences, mathematics, computer science, engineering, and technology. The college is committed to nurturing the talents of young scientists by immersing students in a robust curriculum and applied learning experiences in laboratory research, field study, and cutting edge technology.

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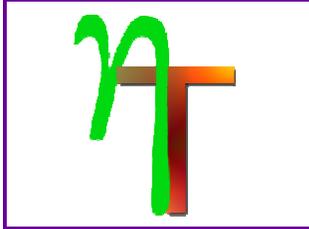


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The NanoProfessor Nanoscience Education Program aims to advance undergraduate nanotechnology education and address the growing need for a skilled, nano-savvy workforce. The NanoProfessor Program, including instruments, an expert-driven curriculum, and student/teacher support materials, is available for high schools, community colleges, technical institutes, and universities worldwide. More information is available at: www.NanoProfessor.net.

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SAI Global Technologies, Inc. (SGT) is an innovative technology company with a “Will Do” attitude. SGT aims to become a global leader in production, processing, and application of nanomaterials and nanotechnology products. SGT is focusing on technologies in the areas of production of nanomaterials, nanofluids, nanocomposites, and material process development. SGT is currently working on an innovative filtration system for removing arsenic and organic pollutants in drinking water; developing shock absorbing devices based on beds of tiny, shock absorbing carbon springs termed *coiled carbon nanotubes* which could be used to absorb and distribute the shock. **www.saiglobaltech.com: Contact:** Rao Govindaraju (210) 380-7343.

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