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2012 Smart Structures/NDE

11–15 March 2012

Call for Papers

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by 29 August 2011

Join the leaders in adaptive structures and mechanisms research and applications

Conference and Course Dates
11–15 March 2012

Exhibition Dates
13–14 March 2012

Town and Country Resort
& Convention Center
San Diego, California, USA

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Technologies

- Smart Structures and Materials
- Non-destructive Evaluation
- Structural Health Monitoring
- Energy Harvesting/ Energy Systems
- Biological and Medical Applications
- Nanotechnology
- Biomimetics and Bio-inspiration
- Civil Infrastructure Systems
- Industrial and Commercial Applications
- Modeling, Control, and Optimization
- Bio-inspired and Robotic Systems
- Electroactive Polymers
- Shape Memory Alloys
- Actuators and Damping
- Automotive and Aerospace Applications
- MR Fluids and Elastomers
- Multifunctional and Piezoelectric Materials
- Embedded and Self-Diagnostic Sensors
- Optical Fiber Sensors
- Sensor Networks
- Real-Time NDE

2012
Call for Papers

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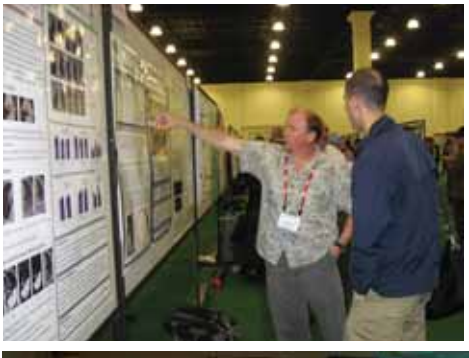
Smart Structures/NDE

Showcase your advances in smart sensors, NDE and structural health, energy harvesting, civil and aerospace systems, EAP, biomimetics, and multifunctional materials.

Present your work to the world's best audience

With new R&D funding initiatives on the horizon for agencies like NIST, NSF, and DOE, the EU, and governments worldwide, presenting your work at Smart Structures/NDE exposes it directly to representatives from those agencies who attend the conference each year.



Connect with others at this cross-disciplinary meeting

Participate in the one event that brings together the brightest minds focusing on some of the most promising technologies across a broad array of disciplines.

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Top reasons to present at Smart Structures/NDE from past presenters:

- Exposure to a global network of researchers
- Research results reach a worldwide audience
- Obtain feedback and new ideas
- Hear a broad spectrum of other work in progress
- Develop ideas for future research

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Contents

Submit your abstract by
29 August 2011

Plan to Present

The Organizing Committee of SPIE 19th Annual International Smart Structures and Materials + Nondestructive Evaluation and Health Monitoring invites you to present at this exciting meeting. This unique symposium offers many opportunities to network with colleagues from a variety of disciplines in academia, industry, and government from all over the world. Over the last two decades, this meeting has grown from small beginnings in the then-emerging field of smart systems into a premier symposium. This symposium has been the incubator for the emergence of the field of electroactive polymers, and more recently for biomimetics.

Complementary techniques and application of smart structures and materials have been discussed in the joint symposium with NDE and Health Monitoring for the past six years. This event has developed into one of the world's most important events discussing the monitoring of structural integrity and adaptive/intelligent structures. Now, both symposia are integrated into a single event. This integration offers new avenues for collaboration and interaction opportunities to bring more advances and address greater challenges that lie ahead. Such challenges include areas of homeland security, and benefiting from exciting fields of energy harvesting, nanotechnologies, and others.

The symposium covers all aspects of the evolving fields of materials, enabling technologies, sensor/actuator design and fabrication, MEMS, NEMS, and other micro-, nano- and bio-electronic devices, biomimetics, signal processing and control, systems concepts, wireless sensors and sensor networks, modeling and simulation, and applications of these technologies to cover the whole spectrum of life in the 21st century including commercial, medical, aerospace, military uses and many others. It also includes several parallel conferences on a range of topics related to NDE, health monitoring, safety, security, characterization of materials, and detection of materials defects and degradation, application of micro- and nanomaterial systems, health monitoring of structural and biological systems, NDE for aerospace materials and applications, and NDE technologies for homeland security.

The symposium is organized in ten parallel conferences. It brings together emerging technologies and advanced research in instrumentation, sensing, and measurement science with progressive management and diagnostic approaches and smart systems. Engineers and researchers from government, military, academia and the commercial sector will discuss the current status and future directions of smart structures and materials, NDE, and health monitoring. Case studies, emerging research agendas, and innovative new technologies will be presented.

This meeting is a showcase for multidisciplinary research and provides an excellent opportunity to explore new research areas by teaming with new partners from fields other than your own. We look forward to seeing you in San Diego!

Symposium Chairs

Norbert Meyendorf, Fraunhofer-Institut für Zerstörungsfreie Prüfverfahren and Univ. of Dayton

Norman Wereley, Univ. of Maryland, College Park

Symposium Cochairs

Victor Giurgiutiu, Univ. of South Carolina

Christopher S. Lynch, Univ. of California, Los Angeles

SPIE Smart Structures / NDE Lifetime Achievement Awards

Each year the symposium committee acknowledges the efforts of luminaries in the fields of SSM and NDE. Recipients will be honored on Monday morning before the opening plenary session.

SPIE/ASME Best Student Paper Contest

SPIE and the ASME Adaptive Structures and Material Technical Committee sponsor the best student paper presentation contest. Entrants will be judged by a committee of the ASME Adaptive Structures and Materials Technical Committee. The top six finalist student authors will present their papers at a special session.

ASME Best Paper Awards

The ASME Technical Committee presents two awards annually: Best Paper in Structures and Best Paper in Materials.

Smart Structures Product Implementation Award

The Smart Structures Product Implementation Award is intended to recognize those who are transitioning smart structures and materials technologies into real products. A panel of independent experts selects the best product based on its importance, uniqueness, and usefulness to defense or commercial industries. We are looking for the most innovative—but realistic—products using smart structures and materials technologies. System integration aspects are very important criteria as well.

ASME Gary Anderson Early Achievement Award

This award is given for notable contribution(s) to the field of Adaptive Structures and Material Systems. The prize is awarded to a young researcher in his or her ascendancy whose work has already had an impact in his/her field within Adaptive Structures and Material Systems.

Complete Award Information

For complete award information and instructions on how to enter, please visit the Award page of the Smart Structures/NDE conference website: http://spie.org/sscall

Participate in the Poster Session

The evening Poster/ Exhibition reception provides an interactive forum to present your work and network with your colleagues.

Bioinspiration, Biomimetics, and Bioreplication II (SSN01)

Conference Chair: **Akhlesh Lakhtakia**, The Pennsylvania State Univ. (United States)

Cochair: **Raúl J. Martín-Palma**, Univ. Autónoma de Madrid (Spain)

Program Committee: **Yoseph Bar-Cohen**, Jet Propulsion Lab. (United States); **Steven F. Barrett**, Univ. of Wyoming (United States); **Michael H. Bartl**, The Univ. of Utah (United States); **Javaan S. Chahl**, Defence Science and Technology Organisation (Australia); **Frank E. Fish**, West Chester Univ. of Pennsylvania (United States); **Joshua L. Hertz**, Univ. of Delaware (United States); **Dietmar W. Hutmacher**, Queensland Univ. of Technology (Australia); **Peng Jiang**, Univ. of Florida (United States); **Shuichi Kinoshita**, Graduate School of Frontier Biosciences (Japan); **Sunghoon Kwon**, Seoul National Univ. (Korea, Republic of); **Hoon Cheol Park**, Konkuk Univ. (Korea, Republic of); **Antonio Scaglione**, Univ. degli Studi di Salerno (Italy); **James D. Weiland**, The Univ. of Southern California (United States); **H. Donald Wolpert**, Bio-Optics (United States)

Living organisms provide inspiration for innovations in many different fields and for entirely different reasons. Engineered biomimicry takes ideas and concepts from nature and implementing them in different fields of science, ranging from engineering to computing, aiming at the development of novel devices with desirable functionalities. Like any mimicked organism or natural functionality, this evolving field is highly multidisciplinary in nature, and embraces aspects related to physics, materials science, nanotechnology, biology, chemistry, mechanical properties, computing and control, design integration, optimization, multifunctionality, and cost effectiveness.

Bioinspiration, biomimetics, and bioreplication are three words that have entered the engineering lexicon during the last decade, due to broad technological advances that allow us to approach the sophistication of biological systems. Bioinspired engineering is the production of a natural outcome of a biological activity: e.g., the concept of flying machines was inspired by the flight of birds. Biomimetic engineering is the reproduction of a natural functionality by copying certain physical and chemical attributes of an organism, as exemplified by a comparison of Velcro with burrs produced by certain plants. Bioreplication, the reproduction of natural devices, is nowadays emerging as, for instance, certain researchers seek to reproduce structural colors by directly replicating the iridescent wings of butterflies.

The third edition of this conference (previously named Biomimetics and Bioinspiration), welcomes contributions from industry, academia and government research organizations. Topics of interest cover any relevant aspects of engineered biomimicry, from theoretical considerations, production and characterization to practical applications.

Topics include, but are not limited to:

- adhesion
- superhydrophobicity and self-cleaning
- photonic devices
- biomaterials and composite materials
- detection/sensor systems
- electronic noses and tongues
- energy and resource efficiency
- medical, biomedical, and pharmaceutical applications
- locomotion
- robotics
- aerodynamics
- ultralightweight structures
- nano and microfluidics
- high-strength membranes
- visual systems
- miniature devices
- multifunctional devices
- architecture

The conference will include a Keynote presentation by **Horst Bleckmann,** Univ. of Bonn (Germany), several invited talks, contributed talks and posters.

Critical Dates

Abstract Due Date: 29 August 2011

Manuscript Due Date: 13 February 2012

Please Note: Submissions imply the intent of at least one author to register, attend the symposium, present the paper as scheduled, whether it is an oral or poster presentation, and submit a full-length manuscript for publication in the conference proceedings.

Biomimicry, Bioinspiration, and the San Diego Zoo: The Zoo as a Living Library and Resource for Innovation

Nature has developed solutions to nearly every design problem found on this planet. Not only are these solutions innovative and elegant, they are also closed-loop and in harmony with the ecosystem. Biomimicry is the discipline of observing nature and applying nature's lessons to human design and innovation. If we can learn to design, manufacture, and live according to nature's principles, we can develop the tools needed to transform our world.

The San Diego Zoo has developed biomimicry education workshops that bridge the connection between nature and innovation. By sharing our knowledge of the unique characteristics of the plants and animals we steward, we hope to inspire better and more efficient designs, systems, and processes. This session will include an introduction to biomimetic processing, interactive exercises to help stimulate creative thinking, and a discussion of new bio-inspired concepts. There will also be special presentation by a San Diego Zoo "animal ambassador."

In 2011, the San Diego Zoo staff highlighted some of the engineering features of a young alligator named Laveau.

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Electroactive Polymer Actuators and Devices (EAPAD) XIV (SSN02)

Conference Chair: **Yoseph Bar-Cohen**, Jet Propulsion Lab. (United States)

Cochair: **Keiichi Kaneto**, Kyushu Institute of Technology (Japan)

Program Committee: **Barbar J. Akle**, Lebanese American Univ. (Lebanon); **Tunku Ishak Al-Irsyad**, Univ. Teknologi MARA (Malaysia); **Siegfried G. Bauer**, Johannes Kepler Univ. Linz (Austria); **Ray H. Baughman**, The Univ. of Texas at Dallas (United States); **Václav Bouda**, Czech Technical Univ. in Prague (Czech Republic); **Emilio P. Calius**, Industrial Research Ltd. (New Zealand); **Suresh Chandra**, Institute of Technology, Banaras Hindu Univ. (India); **Hyouk Ryeol Choi**, Sungkyunkwan Univ. (Korea, Republic of); **Gal deBotton**, Ben-Gurion Univ. of the Negev (Israel); **Toribio Fernández Otero**, Univ. Politécnica de Cartagena (Spain); **Yahya A. Ismail**, Univ. of Nizwa (Oman); **Edwin W. H. Jager**, Linköping Univ. (Sweden); **Keiichi Kaneto**, Kyushu Institute of Technology (Japan); **Jaehwan Kim**, Inha Univ. (Korea, Republic of); **Kwang J. Kim**, Univ. of Nevada, Reno (United States); **Roy D. Kornbluh**, SRI International (United States); **Gabor M. Kovacs**, EMPA (Switzerland); **Maarja Kruusmaa**, Univ. of Tartu (Estonia); **Jinsong Leng**, Harbin Institute of Technology (China); **Wen-Liang Liu**, Industrial Technology Research Institute (Taiwan); **John D. W. Madden**, The Univ. of British Columbia (Canada); **Siavouche Nemat-Nasser**, Univ. of California, San Diego (United States); **Qibing Pei**, Univ. of California, Los Angeles (United States); **Mehdi Razzaghi-Kashani**, Tarbiat Modares Univ. (Iran, Islamic Republic of); **Jonathan M. Rossiter**, Univ. of Bristol (United Kingdom); **Anuvat Sirivat**, Chulalongkorn Univ. (Thailand); **Elisabeth Smela**, Univ. of Maryland, College Park (United States); **Peter Sommer-Larsen**, Risø National Lab. (Denmark); **Ji Su**, NASA Langley Research Ctr. (United States); **Minoru Taya**, Univ. of Washington (United States); **Frédéric Vidal**, Univ. de Cergy-Pontoise (France); **Gordon G. Wallace**, Univ. of Wollongong (Australia); **Thomas Wallmersperger**, Technische Univ. Dresden (Germany); **Qiming M. Zhang**, The Pennsylvania State Univ. (United States)

EAP materials have unique characteristics that are enabling new technologies. These characteristics include the ability to undergo larger displacements than almost any other class of smart materials, the pliability needed for biomimetic and other mechanically flexible systems, low densities and low cost. Of particular interest is their potential to augment, improve upon, and possibly replace biological muscles. The same characteristics that make EAPs attractive for actuators can also be exploited to enable new types of generators or sensors. Development of effective and robust mechanisms and devices that are actuated by EAP materials requires improved theoretical and empirical understanding of their behavior, design concepts for efficient actuation, generation and sensing, and reliable and repeatable fabrication and characterization methods, as well as effective control algorithms and electronics.

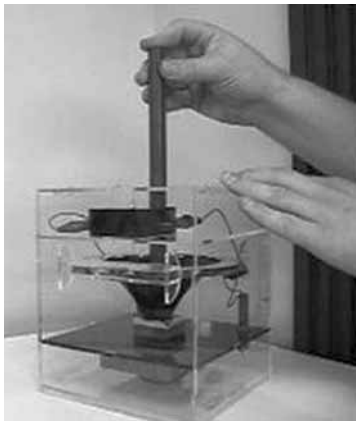
The objective of this conference is to identify EAP material improvements and new developments; enhance the understanding of their electromechanical behavior, including effective modeling of their electro-mechanics and chemistry; cover techniques of processing and characterization; and showcase applications of these materials. Further, this conference is seeking to promote the development of high performance EAP as smart materials and to increase the recognition of EAP as viable options for use in smart structures.

Papers are solicited on but not limited to the following EAP related topics:

- Advances in EAP materials
- Theoretical models, analysis and simulation including computational chemistry
- Measurement, testing and characterization methods
- Manufacturing technologies, including electroding, synthesis, processing, shaping and fabrication
- Design and engineering of actuators, sensors and their integration into systems
- Technology from miniature scale (MEMS, micro and nano) to large devices
- Applications in artificial muscles, robotics, biomimetics, energy harvesting, medical, industry, etc.
- Driving electronics, system integration and packaging
- Control algorithms for devices and their implementation in software and hardware

A special Session will be dedicated to the subject of "EAP Actuated Medical and Tactile Devices" chaired by **John David W. Madden,** The Univ. of British Columbia (Canada); and **Yahya A. Ismail,** University of Nizwa, (Sultanate of Oman);

EAP-in-Action Session



This Session, held annually as part of the SPIE EAPAD conference, is intended to turn the spotlight on Electroactive Polymer (EAP) materials and their applications, as well as increase the recognition of their potential for smart structures. New materials and applications are continuing to emerge, and this session is intended to provide the attendees an opportunity to see a demonstration of EAP materials in action. This Session offers a forum of interaction between the technology developers and potential users, as well as a "hands-on" experience with this emerging technology. It provides a great opportunity to see the capability of state-of-the-art of EAP as potential actuators-of-choice. The first Human/EAP-Robot Armwrestling Contest was held during this session of the 2005 EAPAD conference. In 2012, we are seeking to hold another armwrestling contest that would focus on measuring the speed and actuation force of EAP-actuated arms and possibly have the arms wrestle each other.

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Active and Passive Smart Structures and Integrated Systems VI (SSN03)

Conference Chair: **Henry A. Sodano**, Univ. of Florida (United States)

Cochairs: **Wei-Hsin Liao**, The Chinese Univ. of Hong Kong (Hong Kong, China); **Gyuhae Park**, Los Alamos National Lab. (United States)

Program Committee: **Gregory S. Agnes**, Jet Propulsion Lab. (United States); **Mehdi Ahmadian**, Virginia Polytechnic Institute and State Univ. (United States); **Eric H. Anderson**, CSA Engineering, Inc. (United States); **Hiroshi Asanuma**, Chiba Univ. (Japan); **Amr M. Baz**, Univ. of Maryland, College Park (United States); **Diann E. Brei**, Univ. of Michigan (United States); **Gregory P. Carman**, Univ. of California, Los Angeles (United States); **Aditi Chattopadhyay**, Arizona State Univ. (United States); **Seung-Bok Choi**, Inha Univ. (Korea, Republic of); **William W. Clark**, Univ. of Pittsburgh (United States); **Alison B. Flatau**, Univ. of Maryland, College Park (United States); **Farhan Gandhi**, The Pennsylvania State Univ. (United States); **Ephrahim Garcia**, Cornell Univ. (United States); **Mehrdad N. Ghasemi-Nejhad**, Univ. of Hawai'i at Manoa (United States); **Victor Giurgiutiu**, Univ. of South Carolina (United States); **Fernando D. Goncalves**, Lord Corp. (United States); **Faramarz Gordaninejad**, Univ. of Nevada, Reno (United States); **Nakhiah C. Goulbourne**, Univ. of Michigan (United States); **Tristram T. Hyde**, NASA Goddard Space Flight Ctr. (United States); **Daniel J. Inman**, Virginia Polytechnic Institute and State Univ. (United States); **Conor D. Johnson**, CSA Engineering, Inc. (United States); **Seung Jo Kim**, Seoul National Univ. (Korea, Republic of); **Jeong-Hoi Koo**, Miami Univ. (United States); **Yuji Matsuzaki**, Nagoya Univ. (Japan); **Roger Ohayon**, Conservatoire National des Arts et Métiers (France); **Mohammad Rastgaar Aagaah**, Massachusetts Institute of Technology (United States); **Norbert Schwesinger**, Technische Univ. München (Germany); **Steve Southward**, Virginia Polytechnic Institute and State Univ. (United States); **Roger Stanway**, The Univ. of Sheffield (United Kingdom); **Kon-Well Wang**, Univ. of Michigan (United States); **Norman M. Wereley**, Univ. of Maryland, College Park (United States)

This conference, largely resulting from merge of the former 'Damping & Isolation' and 'Smart Structures & Integrated Systems' conferences, as well as a part of 'Modeling, Signal Processing, and Control' focuses on topics related to design, analysis, fabrication and testing of active/passive smart dynamic structural systems. Structural vibration, damping and acoustic control of integrated systems can be enhanced through passive, active, and hybrid approaches. The conference emphasis is on the interplay of actuation, sensing, and processing capabilities to create active systems with new function capabilities. The goal is to create a multidisciplinary forum to bring together developments in diverse application areas in aeronautical, space, marine, transportation and civil applications, etc. The scope of the conference ranges from system level evaluation of smart structures to development, modeling, and optimization of new actuation and sensing techniques for integrated systems. Authors are encouraged to describe developments in active materials, 'smart' structural components, and integration of these and other constituent technologies into advanced systems that hold the potential for expanding the application of active and passive smart structures and integrated systems.

In addition to the 200 word abstract, authors are welcome to submit an extended abstract (approximately 2 pages long, or 1000 words) for review purposes.

Acceptance priority will be given to authors who submit a 2-page summary of their work.

The file can be submitted as a Word .doc or postscript file during the abstract submission process. The extended abstract, used for selecting the papers by Track organizers, can include figures, test results, and references. The short abstract will be included in the publication that is provided to the conference attendees.

The primary topics for the conference are organized into the following 8 tracks:

Track 1: Energy Harvesting and Scavenging

Track 2: Biological-inspired Systems and Bio-MEMS

Track 3: Passive and Active Vibration Isolation Systems

Track 4: Magneto Rheological Systems

Track 5: SMA- and Piezo-based Materials and Systems

Track 6: Micro and Nano Integrated Systems

Track 7: Aircraft, MAV/UAV and Morphing systems

Track 8: Modeling, Simulation, Optimization, Signal Processing, Control, and Design of Integrated Systems

Authors can select the track that best fits their paper topic during the abstract submission process.

Critical Dates

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Please Note: Submissions imply the intent of at least one author to register, attend the symposium, present the paper as scheduled, whether it is an oral or poster presentation, and submit a full-length manuscript for publication in the conference proceedings.

Behavior and Mechanics of Multifunctional Materials and Composites VI (SSN04)

Conference Chair: **Nakhiah C. Goulbourne**, Univ. of Michigan (United States)

Cochair: **Zoubeida Ounaies**, The Pennsylvania State Univ. (United States)

Program Committee: **Abhijit Bhattacharyya**, Univ. of Arkansas at Little Rock (United States); **Gregory P. Carman**, Univ. of California, Los Angeles (United States); **Pavel M. Chaplya**, Sandia National Labs. (United States); **Constantin Ciocanel**, Northern Arizona Univ. (United States); **Marcelo J. Dapino**, The Ohio State Univ. (United States); **Sergio L. dos Santos e Lucato**, Teledyne Scientific Co. (United States); **LeAnn E. Faidley**, Iowa State Univ. (United States); **Daniel J. Inman**, Virginia Polytechnic Institute and State Univ. (United States); **Marc Kamlah**, Karlsruher Institut für Technologie (Germany); **Haluk E. Karaca**, Univ. of Kentucky (United States); **Ibrahim Karaman**, Texas A&M Univ. (United States); **Kwang J. Kim**, Univ. of Nevada, Reno (United States); **Dimitris C. Lagoudas**, Texas A&M Univ. (United States); **Chad M. Landis**, The Univ. of Texas at Austin (United States); **Kam K. Leang**, Univ. of Nevada, Reno (United States); **Donald J. Leo**, Virginia Polytechnic Institute and State Univ. (United States); **Jiangyu Li**, Univ. of Washington (United States); **Christopher S. Lynch**, Univ. of California, Los Angeles (United States); **Karla M. Mossi**, Virginia Commonwealth Univ. (United States); **Robert C. O'Handley**, Massachusetts Institute of Technology (United States); **Etienne Patoor**, Univ. Metz (France); **Ralph C. Smith**, North Carolina State Univ. (United States); **Jonghwan Suhr**, Univ. of Delaware (United States); **Vishnu B. Sundaresan**, Virginia Commonwealth Univ. (United States)

Smart structures utilize active materials as sensors and actuators to sense and respond to their environment. These include piezoelectrics, electrostrictives, magnetostrictives, electroactive polymers (EAP), shape memory alloys (SMA), and ferromagnetic shape memory alloys (FSMAs). Development of smart structures involves the integration of active and passive material systems, often including the coupling of relevant mechanical, electrical, magnetic, thermal, optical, or other physical properties. This integration can subject the active materials to large stress levels, cyclic loads, thermal loads, or chemical effects that result in nonlinear responses and large variations in material properties. Meeting the materials needs of the smart structures community over the coming decade and beyond will require the development of new active materials, further characterization of new and existing active materials, and development of mathematical models of material behavior and material failure suitable for reliable structural design. This conference will bring together researchers from the materials, mechanics, and applications communities with common interests in material properties. Papers are solicited in the area of active materials with emphasis on material behavior and mechanics.

Topics of interest are broadly grouped into the following categories:

- Mathematical analysis of active materials
- Constitutive behavior: composition/structure/property relations, coupled field behaviors, micromechanics models, multiscale models, molecular dynamics
- Reliability models: fracture toughness, fatigue crack growth, field coupled fracture, fracture mechanics of active materials, fatigue life prediction, other failure modes and mechanisms (e.g., aging, depoling, dielectric breakdown, Curie temperatures, creep etc.)
- Material development and characterization
- Multifunctional composite materials, nano-structured composite materials
- Bio-functional materials and structures
- Shape memory alloys (SMAs), porous SMAs
- Ferromagnetic shape memory alloys (FSMAs)
- Single crystal and polycrystalline ferroelectrics and magnetostrictives
- High-temperature ferroelectrics and electrostrictives
- Ductile magnetostrictives; galfenol
- Thin-film active materials for structural applications (e.g. flow control)
- Electroactive polymers (ionic and electronic), shape memory polymers, and ionic gels

Industrial and Commercial Applications of Smart Structures Technologies VI (SSN05)

Conference Chair: **Kevin Farinholt**, Los Alamos National Lab. (United States)

Cochair: **Steven F. Griffin**, Boeing LTS Maui (United States)

Program Committee: **Eric H. Anderson**, CSA Engineering, Inc. (United States); **Emil V. Ardelean**, Schafer Corp. (United States); **Brandon J. Arritt**, Air Force Research Lab. (United States); **Christian Boller**, Fraunhofer-Institut für Zerstörungsfreie Prüfverfahren (Germany); **Diann E. Brei**, Univ. of Michigan (United States); **Alan L. Browne**, General Motors Corp. (United States); **Peter C. Chen**, NASA Goddard Space Flight Ctr. (United States); **Marcelo J. Dapino**, The Ohio State Univ. (United States); **L. Porter Davis**, Honeywell Defense and Space Electronic Systems (United States); **Xiao-Yan Gong**, Medical Implant Mechanics LLC (United States); **Holger Hanselka**, Fraunhofer-Institut für Betriebsfestigkeit und Systemzuverlässigkeit (Germany); **Ernie Havens**, Cornerstone Research Group, Inc. (United States); **Nancy L. Johnson**, General Motors Corp. (United States); **Chad H. Joshi**, Energen, Inc. (United States); **Jayanth N. Kudva**, NextGen Aeronautics, Inc. (United States); **Amrita Kumar**, The Florida State Univ. (United States); **Ou Ma**, New Mexico State Univ. (United States); **Geoffrey P. McKnight**, HRL Labs., LLC (United States); **Christopher Niezrecki**, Univ. of Massachusetts Lowell (United States); **Gyuhae Park**, Los Alamos National Lab. (United States); **Marc E. Regelbrugge**, Rhombus Consultants Group (United States); **W. Lance Richards**, NASA Dryden Flight Research Ctr. (United States); **Eric J. Ruggiero**, GE Global Research (United States); **Janet M. Sater**, Institute for Defense Analyses (United States); **Henry A. Sodano**, Univ. of Florida (United States); **Edward V. White**, The Boeing Co. (United States)

The broad but interdisciplinary field of smart structures seeks to apply multifunctional capabilities to existing and new structures. Smart structures and materials are those which sense external stimuli and respond in real or near real-time. This conference concentrates on the insertion of smart structure technologies in real-world applications. There is a strong emphasis on the development of products, system integration, and advanced technology demonstrations conducted in realistic environments that extend beyond the laboratory benchtop. Maturity of technology is emphasized.

Specific examples of the successful insertion, and lessons learned from such insertions, of active materials and smart structures into products currently on the market are highly encouraged as motivating examples for the research community. Sufficient technical reporting should be provided in the paper, with the understanding that certain information may remain proprietary and will not be discussed in great detail. Those who submit papers describing mature industrial or commercial products may also wish to consider a separate application for the annual Smart Structures Product Implementation Award.

Potential topic areas include the methodology, approach, development, measurement, application, and/or integration of adaptive materials, devices and structures into:

- Consumer products and industrial systems
- Automotive: actuators, sensors, active noise control, smart devices, etc.
- Aerospace: aircraft, spacecraft, launch vehicles, space optics, rotorcraft, turbines, etc.
- Naval: marine ships, communications, submarines, unmanned underwater vehicle, turbines
- Civil and Infrastructure: bridges, power, building monitoring, etc.
- Wind energy: operational/health monitoring, adaptive structures
- Machinery and manufacturing
- Medical devices and equipment

In addition to the regular program, there will be several focused tracks this year.

1. Smart Materials and Devices for Vehicle Applications

The integration of this field in next-generation vehicles is a logical choice as these materials represent a platform for significant innovation by original equipment manufacturers (OEMs), top tier suppliers, research organizations, and universities. These materials include, but are not limited to, piezoelectrics, electrostrictives, magnetostrictives, ionic polymers, shape memory alloys (SMAs), thermoelectrics (TE), ferromagnetic shape memory alloys (FSMAs), optoelectrics, and magnetorheological and electrorheological fluids. Topics of interest are broadly grouped into the following categories:

- Active material device development and characterization: smart materials for suspension, chassis, body, and interior elements; latch mechanisms; smart tire sensors
- Adaptive powertrain systems: variable valve timing, transmission flow control, alternative clutch actuators, powertrain actuators, smart starting devices, active valves and seals
- Energy efficiency: energy recovery from vibration and waste heat, reduction in pump loses, reduction in losses due to internal leakage, friction control
- Reliability of vehicle components and systems: models may include: fracture toughness, fatigue crack growth, field coupled fracture, fracture mechanics of active materials, fatigue life prediction, other failure; modes and mechanisms (e.g., aging, depoling, creep, etc.)
- Safety and crashworthiness: active restraint systems, composite panels with enhanced energy absorption, sensing and logging of crash data
- Noise and vibration attenuation: passive and active damping treatments, local and global stiffness control of chassis and body members, smart foams and noise absorbing materials, active and semiactive engine mounts, active torsional mounts

2. Enabling Technologies for Embedded Sensing

The goal of this track is to provide a forum to discuss enabling technologies for embedded sensing systems that can be used to monitor a system's operational condition and integrity. The intent is to focus on sensing systems that are well developed and nearing commercial availability. Systems should be viable for field demonstrations that have evolved beyond basic laboratory studies. The secondary goal of this session is to consider potential energy solutions for the long-term deployment of embedded sensors. Possible energy solutions could include: advanced battery technologies, energy harvesting and energy transmission techniques. Some topics of interest are grouped into the following categories:

- Structural health monitoring / condition-based sensing systems: low frequency passive sensing, active sensing, frequency domain methods, wave propagation, acoustic emissions
- Energy harvesting, transmission, or storage technologies: electromechanical transducers, thermoelectric generators, RF harvesters, MEMS transducers, acoustically driven harvesters, new energy harvesting materials, etc., matched impedance circuits, series / parallel SSHI circuits, etc., novel capacitors, chemical or mechanical batteries
- Fielded sensing or energy harvesting systems
- Long-term deployment for civil, industrial, and/or military applications

3. Aerospace Applications

The focus of this track is on smart structures technologies, advanced material systems, and monitoring/diagnostic techniques for military and commercial aerospace applications. Contributions to this session can address a broad range of research topics related to adaptive structures, tunable materials, and embedded sensing as applied to aircraft, spacecraft, launch vehicles, etc. Topics of interest include:

- Structural health monitoring and structurally integrated sensing schemes for detecting/identifying exogenous phenomena
- Engineered and/or tunable properties: electromagnetic interaction, stiffness, thermal conductivity, electrical conductivity, etc.
- Deformable/reconfigurable geometries
- Suitability/survivability in harsh environments
- Control of smart materials/structures in aerospace applications

4. Wind Energy Applications

As one of the leading forms of renewable energy, wind turbine manufacturers strive to increase power and efficiency through the development of larger, more complex turbines. The intent of this session is to provide a forum for research efforts focused on improving system reliability, robustness, and efficiency, while reducing the cost of energy through lighter and larger wind turbines. As with other industries, the integration of active materials and smart structures technologies can increase system awareness, provide health assessments, improve system reliability, and the ability to apply control strategies that increase efficiency and / or reduce component loads. Topics of interest for this session include:

- Application of active materials/systems for state awareness
- Structural health/condition-based monitoring
- Nondestructive inspection techniques
- Adaptive airfoils/control surfaces
- Control strategies and techniques to improve system reliability and efficiency

5. Test Standards and Qualification

The successful integration of smart structures technologies into any commercial or industrial product requires the development of appropriate standards from the material standards through qualification standards. The lack of standards is currently restricting the application of smart structures technologies. This conference committee is interested in receiving papers addressing any of the following topics:

- Material standards and processing
- Standardized tests (NIST, ASTM, ANSI, etc.)
- Acceptance criteria and tests developed for any classes of smart materials
- Development of component level qualification testing standards
- Development of system or subsystem qualification testing standards
- Qualification criteria for various industries (aerospace, civil, medical, etc.)

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Nano-, Bio-, Info-Tech Sensors and Systems (SSN06)

Conference Chair: **Vijay K. Varadan**, Univ. of Arkansas (United States)

Cochairs: **Jaehwan Kim**, Inha Univ. (Korea, Republic of); **Kyo D. Song**, Norfolk State Univ. (United States); **Sang H. Choi**, NASA Langley Research Ctr. (United States); **Yongrae Roh**, Kyungpook National Univ. (Korea, Republic of)

Program Committee: **Christina Brantley**, U.S. Army Research, Development and Engineering Command (United States); **Natalie Clark**, NASA Langley Research Ctr. (United States); **Ajit Khosla**, Simon Fraser Univ. (Canada); **Kimiya Komurasaki**, The Univ. of Tokyo (Japan); **Kunik Lee**, Turner-Fairbank Highway Research Ctr. (United States); **Samuel C. Lee**, The Univ. of Oklahoma (United States); **Uhn Lee**, Gachon Univ. Gil Medical Ctr. (Korea, Republic of); **Xinxin Li**, Shanghai Institute of Microsystem and Information Technology (China); **Yanjian Liao**, Chongqing Univ. (China); **Il-Kwon Oh**, KAIST (Korea, Republic of); **Yeonjoon Park**, National Institute of Aerospace (United States); **Parag G. Patil**, Univ. of Michigan Health System (United States); **Aswini K. Pradhan**, Norfolk State Univ. (United States); **D. Roy Mahapatra**, Indian Institute of Science (India); **Paul Ruffin**, U.S. Army Armament Research, Development and Engineering Ctr. (United States); **Ashok Srivastava**, Louisiana State Univ. (United States); **Tauno Vaha-Heikkila**, VTT Technical Research Ctr. of Finland (Finland); **Richard K. Watt**, Brigham Young Univ. (United States); **T. C. Yih**, Oakland Univ. (United States); **Hargsoon Yoon**, Norfolk State Univ. (United States); **Ming Zhou**, Suzhou Institute of Nano-tech and Nano-bionics (China)

This conference considers new ideas, technologies, and potential applications across a wide range of disciplines critical to Nano-, Bio-, and Info-Technologies based sensors and systems as applied to health monitoring of human and complex systems in engineering and medicine. This year theme focuses also on Brain-Machine Interface. Along with the research on sensors using nanostructures, sensor networking technology enables us to imagine a future where billions of people regularly access applications in global network as their daily routine. Newly developed technology of nanoscale sensors integrated with microelectronic components, especially with wireless communication devices will generate significant impact in broad range of applications such as human health care, national security and the environmental monitoring.

The integration of the nanoscale sensors with RFID and wireless communication systems will provide vast opportunities for biological sensor applications, especially for physiological monitoring of human health and bio-hazard material detection system networked with personal mobile phone and internet services. The experimental, technological, and theoretical aspects of the relevant micro and nanoscience in engineering and medicine are welcome. A special focus will be given to antiterrorist efforts, homeland defense applications, security electronics, and reliability/failure issues and human disease monitoring and control.

Organic electronics provide environmental-friendly devices and material technologies that are built on flexible and conformal substrates. The flexible electronics is a key enabler for a number of platform technologies such printed transistors, smart electronic textiles, electronic papers and displays, embedded power sources and integrated sensing devices. A number of low-cost and large-area electronic applications also include smart cards, smart price and inventory tags such as RFIDs.

The conference aims to add the following areas to promote interdisciplinary exchange in understanding engineering systems from biological ones: nanowires, carbon nanotubes, magnetic nanotubes, organic electronics, MEMS, bioMEMS, nanostructures, nanoelectronics, microfluidics, high selectivity and sensitivity biological and chemical sensors, detection of harmful chemical and biological agents, microsensors for radioactivity, low power consumption physical and chemical sensors, security electronics, reliability and failure aspects, biomedical applications, biomimetics, fast DNA sequencing, smart drug delivery, polymer electronics, nanooptics, analytical techniques at nanoscale, nanoassembly behavior, nanointegration, noise aspects and information technology at nanoscale, multifunctional nanosystems, nano/bio interface.

This conference will also focus on advanced methods for the testing, reliability, packaging and metrology of micro-and nano-scale materials and devices. Papers are solicited on, but not limited to, the following or related topics:

Novel Materials and Integration Technologies
- nanomaterials
- carbon nanotubes
- 3D nanostructures
- biomaterials
- nanowires
- integration of nano-and micro-senosrs with microelectronics
- integration of sensors with flexible organic electronics
- novel nanomaterials for display systems
- materials for flexible RFID systems.

Integrated Nano- and Micro- structures
- smart sensors, smart actuators
- smart microsystems
- nanosystems
- drug delivery systems
- nondestructive methods for nano-engineered materials, nano- structures and nano-devices.

Remote Control and Communication
- microantenna, rectenna
- wireless communications electronics
- low power electronics and structures
- remote sensing
- RF MEMS
- reconfigurable antenna
- microwave and millimeter wave components and devices
- Bluetooth technology.

Integrated Interface Electronics
- on-chip compensation and calibration
- data transmission and conversion
- custom electronics
- hybrid and multichip modules
- lab-on-chip.

Simulation, Modeling and IT-Software
- CAD/CAM for nanosystems
- design tools for integrated MEMS and NEMS
- electro-thermo-mechanical modeling
- microfluidics modeling
- IT related software

Brain-Machine Interface
- EEG, EOG, EMG signal acquisition system
- interfacing robot
- electroactive Polymer based artificial muscles
- brain-computer interface

Applications in Engineering and Medicine
- automotive
- aircraft
- biomedical
- pharmaceutical
- bio-implantable chip for disease monitoring and control
- neurotransmitter and stimulator; neurosurgical procedures
- cardiovascular monitoring sensors and systems
- nanomedicine and drug delivery
- wireless communication protocols
- surgical procedures and nanosystems implementation
- glucose sensor system
- physiological monitoring
- smart textiles
- sleep apnea
- cochlear implant
- retinal implant

Critical Dates

Abstract Due Date: 29 August 2011
Manuscript Due Date: 13 February 2012

Please Note: Submissions imply the intent of at least one author to register, attend the symposium, present the paper as scheduled, whether it is an oral or poster presentation, and submit a full-length manuscript for publication in the conference proceedings.

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Sensors and Smart Structures Technologies for Civil, Mechanical, and Aerospace Systems (SSN07)

Conference Chair: **Masayoshi Tomizuka**, Univ. of California, Berkeley (United States)

Cochairs: **Chung-Bang Yun**, KAIST (Korea, Republic of); **Jerome P. Lynch**, Univ. of Michigan (United States)

Program Committee: **Yoshio Akimune**, National Institute of Advanced Industrial Science and Technology (Japan); **Amr M. Baz**, Univ. of Maryland, College Park (United States); **Dumitru Caruntu**, The Univ. of Texas-Pan American (United States); **Fabio Casciati**, Univ. degli Studi di Pavia (Italy); **Chih-Chen Chang**, Hong Kong Univ. of Science and Technology (Hong Kong, China); **Genda Chen**, Missouri Univ. of Science and Technology (United States); **Shirley J. Dyke**, Washington Univ. in St. Louis (United States); **Alison B. Flatau**, Univ. of Maryland, College Park (United States); **Yozo Fujino**, The Univ. of Tokyo (Japan); **Robert X. Gao**, Univ. of Connecticut (United States); **Steven D. Glaser**, Univ. of California, Berkeley (United States); **Faramarz Gordaninejad**, Univ. of Nevada, Reno (United States); **Xiaoyan Han**, Wayne State Univ. (United States); **Benjamin K. Henderson**, Air Force Research Lab. (United States); **Haiying Huang**, The Univ. of Texas at Arlington (United States); **Jerry Q. Huang**, The Boeing Co. (United States); **Kumar V. Jata**, Asian Office of Aerospace Research and Development (United States); **Jeong-Tae Kim**, Pukyong National Univ. (Korea, Republic of); **Ki-Soo Kim**, Hongik Univ. (Korea, Republic of); **Jan-Ming Ko**, The Hong Kong Polytechnic Univ. (Hong Kong, China); **Francesco Lanza di Scalea**, Univ. of California, San Diego (United States); **Yingzi Lin**, Northeastern Univ. (United States); **Chin-Hsiung Loh**, National Taiwan Univ. (Taiwan); **Kenneth J. Loh**, Univ. of California, Davis (United States); **Sami F. Masri**, The Univ. of Southern California (United States); **Eduardo Misawa**, National Science Foundation (United States); **Akira Mita**, Keio Univ. (Japan); **Satish Nagarajaiah**, Rice Univ. (United States); **Yiqing Ni**, The Hong Kong Polytechnic Univ. (Hong Kong, China); **Irving J. Oppenheim**, Carnegie Mellon Univ. (United States); **Jinping Ou**, Dalian Univ. of Technology (China); **Jin-Song Pei**, The Univ. of Oklahoma (United States); **Ser-Tong Quek**, National Univ. of Singapore (Singapore); **Rahmat A. Shoureshi**, Univ. of Denver (United States); **Hoon Sohn**, KAIST (Korea, Republic of); **Gangbing Song**, Univ. of Houston (United States); **Billie F. Spencer, Jr.**, Univ. of Illinois at Urbana-Champaign (United States); **Lizhi Sun**, Univ. of California, Irvine (United States); **Raymond A. Swartz**, Michigan Technological Univ. (United States); **Tsu-Chin Tsao**, Univ. of California, Los Angeles (United States); **Ming L. Wang**, Northeastern Univ. (United States); **Yang Wang**, Georgia Institute of Technology (United States); **Zhishen Wu**, Ibaraki Univ. (Japan); **Chengying Xu**, Univ. of Central Florida (United States); **Hong S. Zhou**, Worcester Polytechnic Institute (United States); **Li Zhou**, Nanjing Univ. of Aeronautics and Astronautics (China)

Advanced sensors, smart materials, and smart structures technology represent an emerging multidisciplinary field that has unlimited potential of broad engineering applications. This particular conference focuses on their applications to civil, mechanical, and aerospace engineering fields. To name a few, these applications include structural control, health monitoring, damage and corrosion assessment, risk, security and emergency management, and intelligent engineering renewal. The potential benefits are many and they cover improved system reliability, enhanced system performance and functionality, enhanced security, decreased life cycle costs, and reduction of physical dimensions and weight.

Researchers in academia, government laboratories, and industry are making progress in advancing the state of the art of the sensor-based technologies addressed by this conference. This conference will provide a forum to bring together experts in the relevant but diverse fields to discuss recent advances and future challenges including international research collaboration.

The conference includes a successful poster session for grantees of the NSF program on Sensors and Sensing Systems (SSS) in the Civil, Mechanical and Manufacturing Innovation (CMMI) Division.

Papers are solicited and special sessions are encouraged on new and emerging technologies in the following areas:

New Technological Advances
- active and semi-active control systems
- data mining and management
- diagnostic systems
- human-centric sensing and control
- low-cost smart materials
- monitoring systems
- multifunctional sensors sensor networks and autonomous operation
- sensors for harsh and extreme environments
- sensors using wireless system
- supervisory control systems
- wearable sensors for biomedical applications

Bio-inspired Sensing and Bio-inspired Actuation
- functional mimicking of extreme species
- organization and processing in bio-networks
- biomolecular sensors and actuators
- biologically mediated fabrication
- bio-inspired smart sensor networks
- implantable and durable medical devices

Modeling of Smart Materials and Sensor Performance
- sensor integration with structure
- sensor behavior
- sensor placement
- smart material response under loads and strain

Design Engineering and Implementation
- design/characterization/creation of multifunctional sensory systems
- smart components, devices, and sub-assemblies
- novel materials for sensing, actuation, and design
- smart systems for evaluation, detection, monitoring, and control

Interrogation of Structures and Smart Materials Behavior
- mechanical systems
- aerospace systems
- civil systems and infrastructure

Integration of Smart Systems
- vehicle health management
- implementation of advanced technologies
- integrated asset management
- operational management
- small-scale and large-scale demonstrations
- smart infrastructure security

Smart Sensor Phenomena, Technology, Networks, and Systems Integration V (SSN08)

Conference Chair: **Theodore E. Matikas**, Univ. of Ioannina (Greece)

Cochairs: **Kara J. Peters**, North Carolina State Univ. (United States); **Wolfgang Ecke**, Institut für Photonische Technologien e.V. (Germany)

Program Committee: **Farhad Ansari**, Univ. of Illinois at Chicago (United States); **George Y. Baaklini**, NASA Glenn Research Ctr. (United States); **Horst J. Baier**, Technische Univ. München (Germany); **Curtis E. Banks**, NASA Marshall Space Flight Ctr. (United States); **Xiaoyi Bao**, Univ. of Ottawa (Canada); **Hartmut Bartelt**, Institut für Photonische Technologien e.V. (Germany); **Rolf Brönnimann**, EMPA (Switzerland); **Brian Culshaw**, Univ. of Strathclyde (United Kingdom); **Gerald Gerlach**, Technische Univ. Dresden (Germany); **Wolfgang R. Habel**, Bundesanstalt für Materialforschung und -prüfung (Germany); **Daniele Inaudi**, Smartec S.A. (Switzerland); **Kerop D. Janoyan**, Clarkson Univ. (United States); **YeonWan Koh**, FIBERPRO, Inc. (Korea, Republic of); **Silvio E. Kruger**, National Research Council Canada (Canada); **Jinsong Leng**, Harbin Institute of Technology (China); **Alexis Mendez**, MCH Engineering LLC (United States); **Norbert G. Meyendorf**, Fraunhofer-Institut für Zerstörungsfreie Prüfverfahren (United States); **Bernd Michel**, Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration (Germany); **Jeff W. Miller**, Micron Optics, Inc. (United States); **Marc Nikles**, Omnisens S.A. (Switzerland); **Richard H. Selfridge**, Brigham Young Univ. (United States); **Holger Speckmann**, Airbus Deutschland GmbH (Germany); **Nobuo Takeda**, The Univ. of Tokyo (Japan); **Roderick C. Tennyson**, Fiber Optic Systems Technology, Inc. (Canada); **Michael D. Todd**, Univ. of California, San Diego (United States); **Eric Udd**, Columbia Gorge Research (United States); **Zhishen Wu**, Ibaraki Univ. (Japan); **Chung-Bang Yun**, KAIST (Korea, Republic of); **Zhi Zhou**, Dalian Univ. of Technology (China)

This conference focuses on the physical and chemical sensor phenomena, on the technologies, networks, and systems integration for Structural Health Monitoring (SHM) and Nondestructive Evaluation (NDE).

Fiber optics, novel, multi-functional materials with advantageous optical, magnetic, or electric parameters for use as sensors, micro and polymer electronics, micro- and nano-technologies, and manufacturing techniques enable the development and application of a wide variety of new sensor principles for SHM and NDE. The emphasis is on how these sensors may be integrated in structures and form sensor networks for improving the performance of a smart structure system for SHM and NDE applications.

The scope of this conference includes the full scale of sensing techniques: fiber-optic sensors and networks, as well as wired and wireless sensors, manufacturing technologies, reliability of sensors and sensor electronics, sensor modeling, design, characterization, qualification, and application in systems and networks.

Papers are therefore solicited in the following areas:

- sensing phenomena, principles and enabling technologies for SHM and NDE
- fiber-optic, ultrasonic, acoustic emission, magnetic, piezo-resistive, eddy current, IR thermography, impedance. and wireless sensors
- photonic, phononic and phoxonic crystal sensors
- sensor technologies at the nano- and micro-scales
- embedded and distributed sensors: simulation, analysis, performance, and self-diagnostics
- sensor characterization and qualification for SHM and NDE applications
- advances in sensor standardization and reliability investigations
- sensor signal processing, analysis, and data fusion
- prognostics modeling and model validation for SHM and NDE, decision support methods
- imaging, image reconstruction, and image analysis techniques (2D and 3D) for NDE by multi-sensor systems
- data visualization and user-friendly human interfaces for SHM and NDE systems
- SHM for condition assessment and condition based maintenance sensor system applications:
- aerospace structures, composites
- geo-technique, mining/oil/gas exploration & production
- civil engineering structures
- monuments of cultural heritage
- conventional, nuclear, and alternative energy systems
- transportation systems and vehicles
- chemical and biochemical systems
- sensor manufacturing for harsh environment
- sensor signal processing and optimization

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Nondestructive Characterization for Composite Materials, Aerospace Engineering, Civil Infrastructure, and Homeland Security VI (SSN09)

Conference Chair: **Andrew L. Gyekenyesi**, NASA Glenn Research Ctr. (United States)

Cochairs: **Tzu-Yang Yu**, Univ. of Massachusetts Lowell (United States); **Peter J. Shull**, The Pennsylvania State Univ. (United States); **Aaron A. Diaz**, Pacific Northwest National Lab. (United States); **H. Felix Wu**, National Institute of Standards and Technology (United States)

Program Committee: **A. Emin Aktan**, Drexel Univ. (United States); **Sreenivas Alampalli**, New York State Dept. of Transportation (United States); **Farhad Ansari**, Univ. of Illinois at Chicago (United States); **Radu Barsan**, Redfern Integrated Optics, Inc. (United States); **Shawn J. Beard**, Acellent Technologies, Inc. (United States); **Fu-Kuo Chang**, Stanford Univ. (United States); **Aditi Chattopadhyay**, Arizona State Univ. (United States); **Genda Chen**, Missouri Univ. of Science and Technology (United States); **Shenen Chen**, The Univ. of North Carolina at Charlotte (United States); **Maria Q. Feng**, Univ. of California, Irvine (United States); **Masoud Ghandehari**, Polytechnic Institute of NYU (United States); **Hamid Ghasemi**, Federal Highway Administration (United States); **Valery F. Godinez-Azcuaga**, MISTRAS Group, Inc. (United States); **Nenad Gucunski**, Rutgers, The State Univ. of New Jersey (United States); **Dryver R. Huston**, The Univ. of Vermont (United States); **Frank Jalinoos**, Federal Highway Administration (United States); **Xiaoning Jiang**, North Carolina State Univ. (United States); **Jerome P. Lynch**, Univ. of Michigan (United States); **Theodore E. Matikas**, Univ. of Ioannina (Greece); **Paul Mlakar**, U.S. Army Engineer Research and Development Ctr. (United States); **Franklin L. Moon**, Drexel Univ. (United States); **Didem Ozevin**, Univ. of Illinois at Chicago (United States); **Pradeep Ramuhalli**, Pacific Northwest National Lab. (United States); **Akira Sasamoto**, National Institute of Advanced Industrial Science and Technology (Japan); **Masanobu Shinozuka**, Univ. of California, Irvine (United States); **Kurt Silvers**, Pacific Northwest National Lab. (United States); **Pei-Chen Su**, Nanyang Technological Univ. (Singapore); **Bernhard R. Tittmann**, The Pennsylvania State Univ. (United States); **Dietmar W. Vogel**, Fraunhofer-Institut für Zuverlässigkeit und Mikrointegration (Germany); **Ming L. Wang**, Northeastern Univ. (United States); **Yang Wang**, Georgia Institute of Technology (United States); **Sharon L. Wood**, The Univ. of Texas at Austin (United States); **Fuh-Gwo Yuan**, North Carolina State Univ. (United States); **Ying Zhang**, Georgia Institute of Technology (United States); **Paul H. Ziehl,** Univ. of South Carolina (United States)

This conference creates a forum to address the current efforts in NDE/NDT for composite materials and aerospace engineering and the technical challenges concerning infrastructure management, maintaining the public safety of our civil infrastructure, and national security against malevolent agents. New and innovative approaches to NDE/NDT and health monitoring of advanced materials and aerospace systems are discussed as well as strategies for NDE/NDT data utilization for overall system safety and performance. In addition, many nations face the twin challenges of maintaining the integrity of their civil infrastructure and their national security.

Homeland security, in particular, has emerged as one of the most complex and pressing challenges of the new Millennium. The theme of this conference focuses on identifying and fostering improvements and new developments of technology in areas related to innovative inspection technologies, real-time monitoring, and cost-effective repair/retrofit using advanced materials and smart systems for composites, aerospace components, civil infrastructure, and our nation's homeland security. Furthermore, this conference seeks to provide a medium for communication among engineers and scientists from stakeholder communities that include experts in NDE/NDT, materials and structures, sensors and sensor networks, system life management, energy harvesting, intelligence, law enforcement and the military, as well as government and policy experts.

Relevant topics of interest to be addressed in this conference include:

- NDE/NDT measurements and quantifications of material properties applied in the engineering fields of composites, aerospace, civil infrastructure, and/or homeland security
- NDE/NDT sensor development, MEMS/NEMS, and intelligent systems
- Aerospace Systems and Civil Infrastructure: continuous monitoring, repair/retrofit with reducing costs, improving measurement accuracy and inspection technologies
- Sensing technologies for civil structures, emergency response, detection and characterization of hidden/suspect and dangerous objects
- Remote sensing and geographic information systems (GIS) for disaster assessment and mitigation
- Technologies for the monitoring and control of portals, assets management, and critical infrastructure
- Methods of detection, characterization, response and recovery of high risk hidden chemical, biological, radiological, nuclear and explosive (CBRNE) threats
- Life management and system analysis/design methodologies for diagnostics and prognostics of materials and structures
- Integration of multiple NDE/NDT techniques for improving interpretation of NDE/NDT results
- Automation of NDE/NDT technologies and industrial applications
- Modeling, simulation, and technology development at various scales ranging from nano- and micro-scale to super-large structures
- NDE/NDT methods for hazardous materials response, forensic science laboratory and field assessments and biometrics
- Mitigation of man-made and natural hazards in physical infrastructure including buildings, bridges, dams, and levees
- NDE/NDT standards, codes, regulations, and acceptance criteria
- Infrastructure management including applications of roads, highways, bridges, water systems, dams, and levees
- Signal processing and data fusion, wireless sensor networks, image processing, energy harvesting

Health Monitoring of Structural and Biological Systems VI (SSN10)

Conference Chair: **Tribikram Kundu**, The Univ. of Arizona (United States)

Cochair: **Wolfgang Grill**, Univ. Leipzig (Germany)

Program Committee: **Douglas E. Adams**, Purdue Univ. (United States); **Sourav Banerjee**, Acellent Technologies, Inc. (United States); **Yoseph Bar-Cohen**, Jet Propulsion Lab. (United States); **Fu-Kuo Chang**, Stanford Univ. (United States); **Anthony J. Croxford**, Univ. of Bristol (United Kingdom); **Paul Fromme**, Univ. College London (United Kingdom); **Victor Giurgiutiu**, Univ. of South Carolina (United States); **Daniel Guyomar**, Institut National des Sciences Appliquées de Lyon (France); **Shivan Haran**, Arkansas State Univ. (United States); **Guoliang Huang**, Univ. of Arkansas at Little Rock (United States); **Sridhar Krishnaswamy**, Northwestern Univ. (United States); **Francesco Lanza di Scalea**, Univ. of California, San Diego (United States); **Jerome P. Lynch**, Univ. of Michigan (United States); **Jennifer E. Michaels**, Georgia Institute of Technology (United States); **Won-Bae Na**, Pukyong National Univ. (Korea, Republic of); **Christopher Niezrecki**, Univ. of Massachusetts Lowell (United States); **Perngjin F. Pai**, Univ. of Missouri-Columbia (United States); **Paul D. Panetta**, Applied Research Associates, Inc. (United States); **Dominique Placko**, École Normale Supérieure de Cachan (France); **Henrique L. Reis**, Univ. of Illinois at Urbana-Champaign (United States); **Piervincenzo Rizzo**, Univ. of Pittsburgh (United States); **Hoon Sohn**, KAIST (Korea, Republic of); **Nobuo Takeda**, The Univ. of Tokyo (Japan); **Michael D. Todd**, Univ. of California, San Diego (United States); **Wei-Chih Wang**, Univ. of Washington (United States); **Andrei N. Zagrai**, New Mexico Institute of Mining and Technology (United States); **George Zentai**, Varian Medical Systems, Inc. (United States)

The scope of the 2012 conference includes emerging and futuristic methods of Structural Health Monitoring - inspection, data transfer, signal processing, diagnosis and prognosis of engineering and biological materials and structures.

In the year 2001 this conference, for the first time, brought together engineers, medical practitioners and scientists to exchange ideas on health monitoring of both engineered and biological structures. The positive experience of 2001 was reinforced in 2002 through 2011 where more participants from the biomedical engineering as well as the NDE community attended the conference. In 2012 the topics that will be covered by this conference will be expanded building on the success of the previous years.

Papers are invited on topics including, but not limited to, the following:

Engineering area:

- Aging, new and future aircraft structures
- Aircraft and aerospace hardware
- Civil infrastructure (bridge, buildings, roads, pipelines etc.)
- Microelectric and electronic components and infrastructure
- Applications of MEMS and other integrated or embedded multifunctional sensors
- Power generation (nuclear, conventional and 'green' technology: windmill, solar)
- Robotics, automation and smart structures (e.g., crawlers, wireless, multimedia, internet)
- Emerging and futuristic techniques and issues: NEMS, energy harvesting etc.

Biodiagnostic area:

- Biomaterials and biostructures (e.g., implants, cells, bones, tissues, etc.)
- Biologically inspired technologies
- Medical NDE methods (MRI, CAT scan, ultrasonography, radiography and others)
- MEMS and emerging/futuristic techniques

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General Information

Venue

Town and Country Resort & Convention Center
500 Hotel Circle North
San Diego, CA 92108 USA

The Town and Country Resort & Convention Center features 1,000 guest rooms spread over 40 lushly landscaped acres in San Diego's Mission Valley. The hotel has five restaurants providing diverse dining experiences, and several lounges offer a relaxing retreat from the day's activities. For casual dining, try the Terrace Café, or for a quick bite visit the Sunshine Deli. You'll enjoy Charlie's for fun eats, a game of pool or the latest sports events on their big screen TV. Trellises Garden Grille features creative appetizers, healthy light entrees, a variety of pastas and pizzas, fish, vegetable entrees and lavish desserts. Kelly's Steakhouse & Irish Pub continues a tradition of serving some of the best slow-roasted prime rib you'll ever taste, as well as hosting nightly sing-alongs in Kelly's famous piano bar.

Three swimming pools, full service spa and health club, barber and beauty services, in-room movies, valet and room services, and a complimentary morning newspaper are available to each guest! Located in the heart of Mission Valley, the Town and Country Resort is ideally situated for attendees and their guests to enjoy the many adjacent and nearby attractions.

Technical Program

Available November 2011

The comprehensive Advance Technical Program for this symposium will list conferences, paper titles, and authors in order of presentation; an outline of all planned special events; and hotel and registration information. An email will be sent to you announcing the availability of the Advance Program in November.

Registration

SPIE Smart Structures/NDE registration will be available November 2011.

All participants, including invited speakers, contributed speakers, session chairs, co-chairs, and committee members, must pay a registration fee.

Fee information for conferences, courses, a registration form, and technical and general information will be available on the SPIE website in November.

Hotel Registration

Opening of the hotel reservation process for Smart Structures/NDE 2012 is scheduled for November 2011. SPIE will arrange special discounted hotel rates and amenities for SPIE attendees that will be available when housing opens. Please do not contact SPIE directly.

Student Travel Grants

A limited number of SPIE student travel grants will be awarded based on need. Applications must be received no later than 10 weeks prior to the meeting, before 3 January 2012. Eligible applicants must present an accepted paper at this meeting. Offer applies to undergraduate/graduate students who are enrolled full-time and have not yet received their PhD.

Clearance Information

If government and/or company clearance is required to present and publish your presentation, start the process now to ensure that you receive clearance if your paper is accepted.

Important News for All Visitors from Outside the United States

Find important new requirements for visiting the United States on the SPIE Smart Structures/NDE website. There are new steps that ALL visitors to the United States need to follow.

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Critical Dates

Abstract Due Date:
29 August 2011

Manuscript Due Date:
13 February 2012

By submitting an abstract, I agree to the following conditions:

An author or coauthor (including keynote, invited, oral, and poster presenters) will:

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- Attend the meeting.
- Make the presentation as scheduled in the program.
- Submit a full-length manuscript (6 pages minimum) for publication in the SPIE Digital Library, Proceedings of SPIE, and CD-ROM compilations.
- Obtain funding for their registration fees, travel, and accommodations, independent of SPIE, through their sponsoring organizations.
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- Please submit a 500-word text abstract for technical review purposes that is suitable for publication. SPIE is authorized to circulate your abstract to conference committee members for review and selection purposes.
- Please also submit a 100-word text summary suitable for early release. If accepted, this summary text will be published prior to the meeting in the online or printed programs promoting the conference.
- Only original material should be submitted.
- Abstracts should contain enough detail to clearly convey the approach and the results of the research.
- Commercial papers, papers with no new research/development content, and papers where supporting data or a technical description cannot be given for proprietary reasons will not be accepted for presentation in this conference.
- Please do not submit the same, or similar, abstracts to multiple conferences.

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