# SPIE Smart Structures/NDE | Smart Thinking!

Record levels of new R&D funding initiatives are on the horizon for the EU, U.S. agencies such as NIST, NSF, and DOE, and governments worldwide. Global R&D Funding Forecast reported that global R&D spending was expected to reach $1.143 trillion by the end of 2009, 3.2% higher than 2008. One bill passed by U.S. Congress last November provides $30.6 billion in science funding to NASA, NSF, and NIST, an increase of $1 billion over 2008 spending.

That includes $88.2 million in NIST funding for nine research projects on structure monitoring and inspection technologies over the next five years.

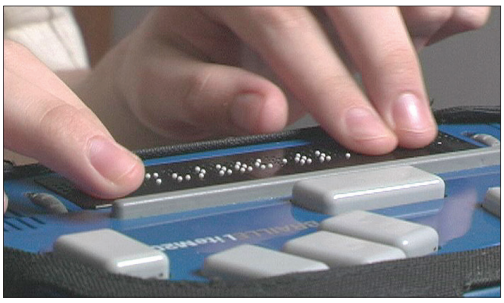
This financial shot in the arm makes it the perfect time to attend the SPIE Smart Structures/Non-Destructive Evaluation (NDE) symposium (7-11 March 2010 in San Diego, CA) to learn about new directions in the field.

This symposium is a multidisciplinary forum that promotes research in adaptive structures and mechanisms, smart sensors and materials, NDE, civil infrastructure, aerospace systems, and other applications. The "smart" technology to monitor bridges, water pipes, and the energy grid would not be possible without the sensor technology presented at this symposium. And electroactive polymer (EAP) technology is being used to develop artificial muscles and prosthetic limbs for soldiers, as well as Braille reading displays that refresh themselves.

Over 800 presentations will be made on structural health monitoring, nanotechnology, new types of energy harvesting and energy systems, piezoelectric materials, and all kinds of sensors.

## Artificial Muscles in Action

The 12th EAP-in-Action demonstrations will be held during a session chaired by SPIE Fellow Yoseph Bar-Cohen Monday, 8 March, from 4:30-5:45 pm. Coinciding with the Electroactive Polymer Actuators + Devices (EAPAD) conference, the demonstrations highlight the latest capabilities and applications of EAP materials. Attendees see these materials in action, get to interact directly with technology developers, and are given "hands-on" experience with this emerging technology.



**Commercial active Braille displays**

The first Human/EAP-Robot arm-wrestling contest was held during this session in 2005, which increased the visibility of the field worldwide and the recognition of its potential. This year, presenters will demonstrate other types of artificial muscles and EAP devices that will help humanity in the near future. Highlights include tactile Braille displays, self-sensing and dielectric elastomer actuator (DEA)-based systems, high strain PolyPower films, bi-stable electroactive polymers, and other EAP applications.

The October 2009 issue of *SPIE Professional* chronicled progress in the effort to develop a low-cost, efficient, refreshable display for Braille text to allow people with visual impairments to benefit from the growing advances in computer technology. Deane Blazie and Noel Runyan of the National Braille Press will be demonstrating some of the commercial active Braille displays during the demonstration session.

## Other Special Events

A "Student Lunch with the Experts" networking event is scheduled for Tuesday, 9 March.

The exhibition is free and is a great place to network, see new products, and see where the SSM/NDE industry is going. The exhibition, with companies such as OZ Optics (see page 4), IOP Publishing, Polytec Inc., and Bose Corporation, will be held Tuesday, 10 March, from 10 am-4 pm and 6 pm-7:30 pm, and from 10 am-4 pm Wednesday, 11 March.

*–Beth Kelley*

## Plenary Speakers

**Gordon Wallace,** University of Wollongong (Australia): Can We LEAP Tall Buildings? Electroactive Polymers: An Alternative Platform for Bionic Devices

**Fu-Kuo Chang,** Stanford University (USA): Structural Health Monitoring: Where to Go From Here?

**Jose Zayas,** Sandia National Labs (USA): Technology Opportunities for Wind Energy Systems

**Christian Boller,** Fraunhofer Institute of Non-Destructive Testing (Germany): Ways and Options for Getting Structural Health Monitoring

## Awards

The SSM Lifetime Achievement Award will be presented to Alison Flatau, professor of aerospace engineering at University of Maryland, College Park (USA). This award recognizes outstanding contributions to research in smart structures and materials as well Flatau's extensive service to the symposium.

The NDE Lifetime Achievement Award will be presented to Fu-Kuo Chang, director of the Structures and Composites Laboratory at Stanford University (USA). Chang is the editor in chief of International Journal of Structural Health Monitoring, a fellow of several societies, and one of the plenary speakers at the symposium.

The Smart Structures Product Implementation Award, ASME Gary Anderson Early Achievement Award, ASME Best Paper Awards, and SPIE/ASME Best Student Paper awards will also be presented.