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Review of Progress in QNDE 2001

The 28th annual Review of Progress in Quantitative NDE was held at Bowdoin College in Brunswick, Maine, July 29 – August 3, 2001. It was an excellent international review that brought together some 367 researchers, engineers, and students in NDE from 28 different countries to discuss latest advances and technology transfer opportunities. The Review was hosted by the Center for NDE at Iowa State University and sponsored by QNDE Programs. Support was provided by the American Society for Nondestructive Testing, the U.S. Department of Energy, the Federal Aviation Administration, the National Aeronautics and Space Administration-LaRC, and the National Science Foundation (Industry/University Cooperative Research Centers). This was the fifth meeting of the Conference at Bowdoin College, one of the favorite conference venues.

High technical standards for the Conference were set in the opening plenary sessions. Robert Thomas, Dean of Arts and Sciences at Wayne State University, and a long-time contributor to QNDE, provided the keynote address entitled "Thermal NDE Techniques from Photoacoustics to Thermosonics" an excellent review of the evolution of thermal wave imaging that included descriptions of first work in understanding photoacoustic phenomena through various steps to the development of practical imaging technology and now the latest coupling of thermal imaging and sonic techniques to produce "thermosonics", a new NDE tool with significant enhancement for the detection of cracks and other flaws. The broad spectrum of Prof. Thomas' work provides an excellent paradigm for NDE researchers to follow. It carries through from fundamental research aimed at understanding a phenomenon to a final practical and reliable instrumented product that is very useful in the field.

The second plenary session focused on new sensor technology. Mool Gupta, Director, Applied Research Center at Old Dominion University, provided insight into the need for and mechanisms of new nanoscale measurement technique that are key to the characterization of new nanoscale materials including carbon nanotubes. Professor Gupta also presented an enticing discussion of new sensors based on nanotube properties. Richard M. White of the University of California at Berkeley (UCB) provided the second talk of the session. Professor White, a founding Director of the Berkeley Sensor and Actuator Center at UCB, provided an extensive review of the exciting advances that have been made in micro-electrical-mechanical systems (MEMS) of the last few years. The potential application spectrum of these devices is enormous and expected to become a \$40 billion annual industry in a few years. One of the most exciting new areas for NDE discussed by Prof. White is the concept of "Smart Dust" – miniature self-powered, wireless sensors that can be placed in various kinds of remote and difficult locations. Prof. White has been the initiator of many new concepts that have ultimately obtained a practical value status – it was exciting to hear him discuss this one

the one.

The technical programs that followed the opening plenary sessions consisted of both verbal and poster sessions. Verbal sessions consisted of invited sessions organized around specific subjects as well as contributed sessions that considered a broader scope of subjects. Organized sessions included considerations of squids, ultrasonic transducer arrays, thermal waves, NDE for rail defects, stress measurements, benchmark problems, and corrosion. New advances were presented in these as well as in the other contributed sessions. Two comments are in order. This was the first time that a fully-organized session in squid NDE technology has been presented; it represents a considerable advance in both the scope and depth of this "budding" technology. The benchmark session represented a new and novel approach to the question of technical NDE standards. Organized by the World Federation of NDE center, the session represented the "first fruits" of an effort to compare results of NDE models obtained by scientists on a global scale using different models and assumptions.

The traditional Wednesday evening session proved both enlightening and popular. Four speakers, Bill Motzer, Ignacio Perez, Bill Winfree, and Claudia Kropas-Hughes, gave talks highlighting their visions of future QNDE needs and directions. All agreed on several general points, including the need for NDE engineering capabilities that are at the level of four year academic engineering graduates, advanced sensors of all kinds (e.g., Professor White's plenary talk), and a much-expanded use of computers and simulators to handle a host of problems that are now unaddressed.

The QNDE 5K race was run on Thursday on a good course and in warm weather. The winners were Christine Valle from the University of Maine with a time of 23:12 and Paul Fromme from the Swiss Federal Institute of Technology, Switzerland with a time of 17:18 (see photos below). With the broad international attendance at QNDE, this event has become one to establish "bragging rights" for the coming year.

The Conference was deeply saddened just prior to its opening by the passing of Walter Podney of SQM, San Diego. Walter was well known in the electromagnetic NDE community and had been very active in the past several years in the research and development of SQUID devices. Together with Harold Weinstock, AFOSR, and John Bowler, CNDE, he helped organize and planned to chair the special session on SQUIDS. The NDE community will sorely miss Walter's leadership skills.



Left: Christine Valle and Paul Fromme

Right: All 5K participants

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