



N. Bruce Thompson

R. BRUCE THOMPSON

1941–2011

Elected in 2003

“For outstanding contributions to nondestructive evaluation, materials processing, and life-cycle management, and for the development of novel ultrasonic technology.”

BY DONALD O. THOMPSON

R. BRUCE THOMPSON—Anson Marston Distinguished Professor in the materials science and engineering department and the aerospace engineering department and director of the Center for Nondestructive Evaluation at Iowa State University and editor of the *Journal of Nondestructive Evaluation*—died on March 7, 2011. He was 69 years old.

Bruce was born to George and Marion Hatch on July 18, 1941, in College Station, Texas. His father was professor of mechanical engineering at Texas A&M University, and his mother was a homemaker. He graduated from A&M Consolidated High School, where he was an excellent student and an active participant in the school’s extracurricular programs. After high school, Bruce attended Rice University in Houston, from which he graduated summa cum laude with a degree in physics, and from Stanford University, where he earned an M.S. in physics and a Ph.D. in applied physics.

Bruce’s professional career began after graduation in 1970 when he accepted a position with the technical staff at the North American Rockwell Science Center (later the Rockwell International Science Center) in Thousand Oaks, California. He became group leader of ultrasonic applications and initiated new research in ultrasonics with emphasis on the development of ultrasonic electromagnetic acoustic transducer technology, a subject in which he rapidly became a technical leader and in

which he developed many patents. He was a strong supporter of nondestructive evaluation (NDE) technology throughout the corporation, particularly its aerospace divisions, where the B-1 strategic bomber program required new quantitative NDE approaches to meet and satisfy the new and challenging damage-tolerant design requirements derived from fracture mechanics principles.

NDE capabilities were required to both “size” a flaw and detect it with quantitatively known reliability. These newly placed demands on NDE spurred theoretical and experimental efforts at the North American Rockwell Science Center. Bruce played a key role in the development of this advanced quantitative NDE technology, in which he specialized in elastic wave interactions with defects. In 1980 he joined the faculty at Iowa State University as part of a core group enlisted to advance the engineering science of NDE and to form the center for NDE at that institution. During his years at Iowa State University, he became an internationally recognized leader in NDE, continuing his research specialties in theories of elastic wave scattering for defects (“measurement models”); theories and practices for NDE characterization of material properties, including microstructural features using elastic waves; and the development of theories and practices for determination of the probability of detection of “fatal” defects in structures by ultrasonic means. He served as graduate thesis adviser for 12 M.S. degree students and 22 Ph.D. degree students and as supervisor for 7 postdoctoral fellows. Bruce also played a key role in the development and teaching of undergraduate NDE courses and the first-of-its-kind NDE minor at Iowa State University. He leaves a rich technical legacy of over 200 publications and critical reviews in refereed edited journals and book chapters, as well as 24 patents.

Besides his research and teaching duties, Bruce was active in administering NDE activities at Iowa State University, serving as director of the center for NDE from 1997 until his death on March 7, 2011, and as co-organizer and host of the internationally attended annual “Review of Progress in Quantitative NDE” and meeting of the directors of the World

Federation of NDE Centers. Earlier, he served as program director of the materials and applied NDE programs and as associate director of science and technology for the Ames Laboratory (U.S. Department of Energy) on the Iowa State University campus. In 1988 he was appointed editor of Springer's *Journal of Nondestructive Evaluation*, a position he held until his passing.

Bruce was active in service to national organizations, especially those in energy and defense. He recently served on the Review Panel on High-Level Liquid Waste Nondestructive Evaluation, the U.S. Air Force Scientific Advisory Board, the Emerging Technology and Research Advisory Committee of the U.S. Department of Commerce, the Single Shell Tank Integrity Expert Panel, the Materials and Manufacturing Directorate, the Defense Science Board, and many others. He also provided expert consultation services for a wide variety of American industries.

Bruce received many awards and honors from various organizations for his outstanding work. In 1992 he became a fellow of the Institute of Electrical and Electronics Engineers. In 1997, Iowa State University honored Bruce by bestowing on him its highest faculty rank—Anson Marston Distinguished Professor—and again in 2001 with the D. R. Boylan Eminent Faculty Award for Research. In 2003, Bruce was elected to the National Academy of Engineering. The American Society for Nondestructive Testing honored him with the Lester Honor Lecture in 2004, the Tutorial Citation Award in 2006, and the Research Council Award for Sustained Excellence in 2007. The British Institute for Nondestructive Testing awarded him the President Honor Lecture and the Roy Sharpe Prize in 2006, and the Iowa Academy of Science presented him with the Distinguished Fellow Award in 2006. Iowa State University honored him again in 2008 by naming him (and his wife Ann separately) as one of 150 visionaries who helped build Iowa State University into today's university of science and technology. In 2009, Bruce earned the NDE Lifetime Achievement Award SPIE Smart Structures/NDE for his many contributions.

Bruce was endowed with many gifts. He led a life characterized by commitment and passion to his family, work, outdoor activity, maps, and always new experiences. Intellectually, he was a giant. Despite his intellectual prowess, he was always humble. He was a genuine person with a heart of gold. His boundless wisdom was matched only by his warmth and willingness to share. Some of his greatest gifts were his interpersonal skills—his ability to communicate with clarity and his sense of fairness for all. Colleagues have said that he was unequaled in his ability to explain complicated and difficult to understand technical issues. Perhaps his greatest gift was his sense of fairness and its demand for justice for all. He always saw the best in any person's actions and always put the best construction on all that the person did. In doing so, he had a firm faith that "things will work out." Bruce leaves behind a rich legacy of family and friends, students and colleagues, technical work, and a philosophy for life built on a wise use of bountiful gifts.

He is survived by his wife, Ann, of Ames, Iowa; son Robert Kirk and wife Leigh of Midland, Michigan; daughter Amy and husband Randy Standridge of San Antonio, Texas; five grandsons—Robert Kyle Thompson, Kolben Hatch Thompson, Alexander Kerr Thompson, Erik Mathew Standridge, and Andrew James Standridge; and a sister, Nancy Bliss, of Los Alamos. Bruce, as he was known to students, friends, and colleagues alike, also leaves an extended global family of hundreds of friends, a rich legacy of high accomplishments, a wealth of affection and admiration, and a heavy sense of loss among his many colleagues.

