

witty humor and well-honed comedic skills to capture the hearts and minds of his audience. One of his most popular demonstrations ran as follows. Rummaging in a huge briefcase he pulled out his famous red toy laser gun into which his technician Ken Sherwin had skillfully installed a real small ruby laser. Next, he noisily began to inflate a large clear balloon. But when his audience looked at the balloon, they saw that something inside it—a blue balloon, with big ears like Mickey Mouse, was also inflating. “There’s a mouse inside the balloon!” Art would say at that point, continuing: “You know it’s terrible the way mice get into everything. We have to get our more or less trusty laser and dispose of it.” And with a pull of the trigger, the ray gun flashed and the inner mouse-shaped balloon burst with a loud pop while the outer balloon remained unharmed. To his audience he then explained: “Now this is a very serious experiment. It illustrates how, with lasers, light is no longer something to look with, it is something you can do things with, and you can do them in places where you can see but not touch as, for instance, at the retina of the eye. One of the very first applications of the laser was for surgery inside the eye, to prevent blindness from either a detached retina or leaky blood vessels.” Art liked to add that he had never heard of these diseases when he started his work on lasers, and if he had set out to find a treatment, he certainly would not have been fooling around with atoms and stimulated emission of radiation!

Many accounts of Art’s research and of his warm and inspiring relationship with his students and coworkers were compiled in a book *Lasers, Spectroscopy, and New Ideas*, which Marc Levenson and William Yen edited for Springer Verlag as a tribute to Art on his 65th birthday. Art’s illness in later years, alas, did not leave him with the strength to write his autobiography. However, his wisdom, insights, memories, and humor have been captured in a series of interviews with Suzanne B. Riess, which were published in 1998 by the Bancroft Library of the University of California, Berkeley.

Art’s abilities were recognized by his peers. He was elected president of the Optical Society of America in 1975 and president of the American Physical Society in 1985. In 1982 the Laser Institute of America established the Arthur L. Schawlow Medal, to be awarded annually. In 1991, APS started to award each year the prestigious Arthur L. Schawlow

Prize in Laser Science. That same year, Art received the National Medal of Science from President George Bush. In 1996, for his invention of the laser, he was inducted into the National Inventors Hall of Fame.

Despite his incredibly busy schedule as a researcher, teacher, and academic statesman, Art also found the time and energy for some personal passions. Starting even while at high school, he assembled a remarkable collection of jazz recordings, he played the clarinet, and he enjoyed recording live jazz music with increasingly sophisticated equipment.

Art also carried out research on communicating with autistic people. He and Aurelia shared the burden of caring for their autistic and mute son Artie. They helped to organize a non-profit corporation, California Vocations, as a group home near Sacramento for autistic people. The main building was donated by Art and named after his wife, who died in 1991 in a tragic automobile accident while on her way to visit Artie.

With the death of Art, the world has lost one of the most influential inventor-scientists of the 20th century, and many of us are mourning the loss of a most compassionate and caring friend.

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Daniel William Martin

Daniel William Martin, whose career in acoustics spanned 60 years, died of cancer in Cincinnati on 7 January. At the time of his death, he was the editor in chief of the *Journal of the Acoustical Society of America (JASA)*, a position he had held since 1985.

Born in Georgetown, Kentucky, on 18 November 1918, Dan earned an AB from Georgetown College in 1937. He earned an MS in 1939 from the University of Illinois, where he also did his doctoral work under the direction of the noted acoustician Floyd Watson, who sparked Dan’s lifelong passion for acoustics. For his PhD, which he earned in physics in 1941, Dan studied brass musical instruments. He did a stroboscopic analysis of the vibrations of the player’s lips, and made anechoic measurements of the radiation patterns for the brass family of instruments.

Starting in 1941, Dan worked for the Radio Corp of America (RCA) on acoustical aspects of military commu-



DANIEL WILLIAM MARTIN

nications, particularly on the development of throat microphones, for which he received the first of his 26 US patents.

In 1949, he joined the Baldwin Co (later Baldwin Piano and Organ), which allowed him to continue to pursue his favorite topic, musical acoustics. In 1957, he became Baldwin’s director of research, a position he was to hold for a quarter of a century. He did extensive research on the decay of piano tones, tone color in electronic organs, musical scales, and the effects of room environments on piano and organ sounds. He also reviewed acoustical patents.

Starting in 1951, Dan also worked as a member of a team of patent reviewers for JASA, and his reviews regularly appeared in the pages of that journal for the next 48 years, a period that encompassed the explosive development of electronic and electroacoustic musical instruments. He served as JASA’s associate editor for patent reviews and in a similar capacity for the *Journal of the Audio Engineering Society*. Over time, he wound up reviewing nearly 4000 patents!

Dan’s career was notable for service to scientific and technical organizations. He was chairman of the IRE (later IEEE) Professional Group on Audio (1955–57), president of the Audio Engineering Society (1964–65), and president of the Acoustical Society of America (1984–85). In addition, he played a continuing role in the development of acoustical standards.

In 1983, after retiring from Baldwin, Dan began a second career as an independent acoustical consultant. He had actually been introduced to consulting in architectural acoustics during his graduate studies at Illi-

nois. His mentor Watson taught a class in architectural acoustics in the physics department at a time when few such courses were available at schools of architecture. Dan helped Watson to test the acoustics of the Purdue Music Hall, the Indianapolis Coliseum, and the Indiana University Auditorium.

Dan's success as a consultant was evidenced by the number of repeat clients in his project files, which listed over 500 projects based in schools, worship spaces, auditoriums, theaters, broadcast studios, and practically every other kind of building. And that total excludes the hundreds of *pro bono* consultations he undertook for churches and other organizations of modest means. One of Dan's most cherished publications was his 1986 study entitled "Providing for the Sounds of Worship."

With the loss of our colleague Dan, we and others in the field of acoustics and acoustical consulting are at once saddened and forever grateful that we had an opportunity to share with Dan at least a part of the almost six decades he was active in acoustics.

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Charles Gregory Speziale

Charles Gregory Speziale, a prominent theorist and modeler in the field of turbulence, died of Anderson-Fabry disease in Newton, Massachusetts, on 7 May. At the time of his death, he was a professor in Boston University's aerospace and mechanical engineering department.

Born on 16 June 1948 in Newark, New Jersey, Speziale attended the Newark College of Engineering, where he earned a bachelor's degree in civil engineering and applied mathematics in 1970 and an MS in mechanics in 1972. He spent the next year at Rutgers University, where he studied mechanical and aerospace engineering. Continuing his education at Princeton University, he earned an MA and PhD in aerospace and mechanical sciences in 1975 and 1978, respectively.

After graduation, Speziale joined the engineering faculty at Stevens Institute of Technology. From 1985 to 1987, he was a member of the engineering faculty of Georgia Institute of Technology. During his time at Stevens and Georgia Tech, he focused

on non-Newtonian fluids and the kinetic theory of gases.

In 1987, he moved to the Institute for Computer Applications in Science and Engineering (ICASE), located at NASA's Langley Research Center in Hampton, Virginia. It was there that he began to devote his undivided attention to turbulence. In this field, where scientific progress was based more on inspired empiricism, Speziale laid down some important mathematical and physical milestones that continue to guide turbulence modelers. His papers on the extended Galilean invariance of the Reynolds stress, the Galilean invariance of the subgrid stresses, and on the limiting behavior of Reynolds stresses in flows subject to strong rotation or magnetic field have become classics in the field of turbulence modeling. He also developed a nonlinear eddy viscosity model that is capable of predicting secondary internal flows. With coworkers at ICASE and NASA Langley, Speziale further advanced turbulence modeling by proposing a pressure-strain model and developing an algebraic model for Reynolds stress. He made contributions to the study of final decay of turbulence and introduced nonlinear fixed-point analysis.

In 1992, Speziale accepted a position as a professor of aerospace and mechanical engineering at Boston University. There, he continued to work intensely on modeling turbulence, focusing now on nonequilibrium features of turbulence.

In January 1997, he suffered a serious injury due to an accidental fall that exacerbated some preexisting health problems. Despite his illness, he continued to make important contributions to the study of turbulence, and he was active as an associate editor of the American Institute of Aeronautics and Astronautics' *AIAA Journal*. Unfortunately, his health deteriorated in recent months and he passed away at the age of 50.

Speziale was passionate about his work, and scientific discussions with him could become intense, but they always remained friendly. He will be remembered worldwide for the elegance, effectiveness, and originality of his use of continuum mechanics in the analysis and modeling of turbulence. And his colleagues at ICASE will also remember his humane side and his neon-colored designer sweaters.

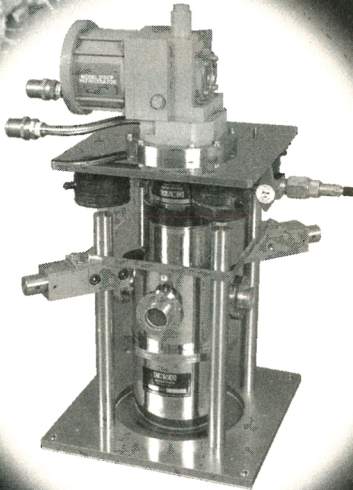
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