

## Obituary

### David Theobald Blackstock, 1930–2021

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**David Theobald Blackstock** died on April 30, 2021, in Austin, Texas, where he was born, raised, and spent most of his life. During his lifetime, he became known internationally as an

eminent scholar in acoustics, a mentor to both junior and senior acousticians, and an extraordinarily kind man.

After receiving BS and MS degrees in physics from the University of Texas at Austin (UT), David served two years in the US Air Force, then joined F. V. Hunt's group at Harvard University, Cambridge, Massachusetts, and earned a PhD in applied physics in 1960. After three years at General Dynamics and seven years as an associate professor of electrical engineering at the University of Rochester, Rochester, New York, David returned permanently to UT in 1970 to join its Applied Research Laboratories, and in 1987, he became professor of mechanical engineering.

David's most important contributions were in nonlinear acoustics, which involves sound so intense that waveforms distort as they propagate, such as sonic booms. Seminal work by David in the 1960s, and independently by R. V. Khokhlov in the former Soviet Union, established a foundation for nonlinear acoustics that is still employed today. Among other fundamental contributions, David developed a general solution revealing a limit for the amplitude of a sound wave no matter how powerful the source is.

Subsequently, David, along with his graduate students, performed research that combined theoretical, experimental, and computational approaches to a range of problems in acoustics. Applications included underwater sonar, jet noise, sonic booms, mitigation of road noise, and biomedical ultrasound. Since the late 1990s, one of David's greatest pleasures was acting as a scientific advisor for a National Institutes of Health grant for breaking kidney stones with shock waves. Their program review in January 2020 was the last conference David attended.

David's teaching and graduate student supervision are legendary. He could succinctly and lucidly describe complex phenomena to students having a range of abilities. He was especially known for precise grading, and he would correct grammar even on homework assignments. The seemingly unending corrections in his signature green ink were a crucial element of how he taught students to both think logically about problems and present solutions clearly. He also had a keen drive to build a sense of community, which could be as simple as playing lunchtime soccer with students or as formal as organizing lunch dates for students to meet with senior researchers at acoustics meetings.

David's professional home was the Acoustical Society of America (ASA). He served as its vice president and president and was a recipient of its Gold Medal, Silver Medal in Physical Acoustics, and Rossing Prize in Acoustics Education. He was also chair of the International Commission for Acoustics, essentially a "united nations" for acoustical societies. In 1992, he was elected to the National Academy of Engineering.

Despite all the international recognition David received, he felt most honored by the ASA Student Council renaming its mentoring award after him in 2019, now called the Student Council David T. Blackstock Mentor Award. His reaction spoke volumes for his humility and the importance he placed on helping young acousticians achieve their dreams.

David was preceded in death by his wife, Marjorie, in December 2019. They are survived by their four children, Silas, Susan, Stephen, and Peter; six grandchildren; and five great-grandchildren.

#### **Selected Publications by David Theobald Blackstock**

- Bennett, M. B., and Blackstock, D. T. (1975). Parametric array in air. *The Journal of the Acoustical Society of America* 57, 562-568.
- Blackstock, D. T. (1966). Connection between the Fay and Fubini solutions for plane sound waves of finite amplitude. *The Journal of the Acoustical Society of America* 39, 1019-1026.
- Blackstock, D. T. (2000). *Fundamentals of Physical Acoustics*. John Wiley & Sons, New York, NY.
- Hamilton, M. F., and Blackstock, D. T. (Eds.) (1998). *Nonlinear Acoustics*. Academic Press, New York, NY.

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