ACOUSTICAL SOCIETY OF AMERICA

HELMHOLTZ-RAYLEIGH INTERDISCIPLINARY

SILVER MEDAL

in

Biomedical Acoustics, Physical Acoustics, and Acoustical Oceanography

Timothy J. Leighton

2013

The Silver Medal is presented to individuals, without age limitation, for contributions to the advancement of science, engineering, or human welfare through the application of acoustic principles, or through research accomplishment in acoustics.

PREVIOUS RECIPIENTS

Helmholtz-Rayleigh Interdisciplinary Silver Medal

Gerhard M. Sessler	1997	Gilles A. Daigle	2005
David E. Weston	1998	Mathias Fink	2006
Jens P. Blauert	1999	Edwin L. Carstensen	2007
Lawrence A. Crum	2000	James V. Candy	2008
William M. Hartmann	2001	Ronald A. Roy	2010
Arthur B. Baggeroer	2002	James E. Barger	2011
David Lubman	2004		

Interdisciplinary Silver Medal

Eugen J. Skudrzyk	1983
Wesley L. Nyborg	1990
W. Dixon Ward	1991
Victor C. Anderson	1992
Steven L. Garrett	1993


Photograph © Brian Bell

CITATION FOR TIMOTHY G. LEIGHTON

. . . for contributions to physical acoustics, biomedical ultrasound, sonochemistry, and acoustical oceanography.

5 JUNE 2013 • MONTRÉAL, CANADA

Tim Leighton grew up in the Lake District in northwest England. A precocious and dedicated student, he earned four "A levels" while enrolled at Heversham Grammar School. He went on to Cambridge University's Magdalene College, where he received a Double First Class Degree in physics and theoretical physics. Double Firsts are rare, and his efforts set the stage for his Ph.D., also at Cambridge, which focused on the study of sonoluminescence using image-intensified cameras. Alan Walton, Tim's thesis advisor, introduced him to Larry Crum who was visiting Cambridge while on sabbatical in 1985. Larry helped guide some of the early stages of Tim's sonoluminescence research. In Tim, Larry saw a ferociously creative researcher who was always a step ahead of both his colleagues and his advisors. Blessed with an agile mind and a wit to match, he was one of those delightfully annoying people who would invariably come up with ideas that left colleagues scratching their heads, wondering why they hadn't thought of them first.

Following graduate school, Tim spent three years as a postdoc at Cavendish Laboratory during which time he worked on an array of interesting problems that explicate his imaginative mind and illustrate his drive. These studies resulted in a series of five papers on the use of sonoluminescence to detect cavitation from clinical ultrasound, four papers on the nonlinear transient response of forced bubbles, and single articles on bubble radiation stress, bubble injection dynamics, and acoustic bubble sizing. Twelve refereed journals articles in five different areas—all from one three-year postdoc; that was Timothy Leighton at work.

In 1992 Tim joined the faculty of the Institute of Sound and Vibration Research (ISVR) of the University of Southampton, where he served as a Lecturer in Underwater Acoustics. He has remained at ISVR and is now Professor of Ultrasonics and Underwater Acoustics, the Head of the Fluid Dynamics and Acoustics Group, and the Associate Dean of Research for the Faculty of Engineering and Environment. Tim lives with his wife Sian and two beautiful children, Rhiannon and Rhys, in a cottage near the northeast boundary of the New Forest, a famed Hampshire nature preserve that was created by William the Conqueror.

Tim has made many contributions to acoustics as a scholar, teacher, and innovator, working principally on the interaction of sound with bubbles. He has published 25 articles in the *Journal of the Acoustical Society of America* and 95 papers in other journals, including five book chapters and two articles in *Acoustics Today*. He is probably best known for his 1994 book, *The Acoustic Bubble*, a quintessential reference book that covers a broad range of issues related to bubble acoustics and acoustic cavitation and has garnered over 1600 citations. Perhaps more importantly, it is likely that many Ph.D. theses written in the last 15 years, related to any topic that involves both bubbles and acoustics, will have included a reference to this work. He has applied his knowledge of bubble acoustics and related physical effects to a wide range of problems in areas as diverse as biomedical ultrasound, sonochemistry, bubble phenomena germane to industry and the environment (such as surf zone acoustics), ultrasonic cleaning, cavitation (more than just detecting bubbles) in mercury, marine mammal sonar, and sound propagation in complex, multiphase media such as bubble clouds and cancellous bone. In addition, Tim has been highly effective at communicating science to the public at large, as demonstrated through numerous radio and television appearances and by the material he posts on his website.

At his relatively young age, Tim has established himself as a leader in UK acoustics and is internationally recognized for his scholarly contributions and his efforts on behalf of the acoustics community worldwide. He has served on administrative and technical committees on behalf of major societies and institutes, has organized or co-organized ten major international meetings on acoustics, serves on the editorial boards of *Ultrasound in Medicine and Biology* and *Archives of Acoustics* and as an Associate Editor for the *Journal of the Acoustical Society of America*.

Tim also enjoys a well-deserved reputation as an enormously informative and entertaining speaker. Indeed, it is difficult to find a more interesting rhetorician at a meeting on acoustics. Tim studies the most diverse of topics—such as searching for sonoluminescence in the human cheek, the acoustics of bubble nets generated by humpback whales, and the propagation of sound in the oceans of Jupiter's moon, Europa. His lectures are not merely rigorous and innovative, they are also lively, enthusiastic, and flat out funny. There is little wonder he is regularly invited to speak at major meetings on acoustics, including Acoustical Society of America meetings, where he has presented six invited talks, including the inaugural lecture for the Medwin Prize in Acoustical Oceanography, which he was awarded in 2001.

Tim has been awarded most of the major prizes conferred by the UK Institute of Acoustics, including the AB Wood Medal (1994) for young researchers working in underwater acoustics, the Tyndall Medal (2002) awarded to a researcher under the age of 40, and the RWB Stephens Medal (2009), which is presented every two years for outstanding contributions to acoustics research or education. He was awarded the Paterson Medal (2006) by the UK Institute of Physics, and the International Commission of Acoustics awarded him the Early Career Award in its inaugural year (2004).

He is a Fellow of the Acoustical Society of America, the Institute of Acoustics, the Institute of Physics and the Royal Academy of Engineering. In addition to these awards for scholarly (education is also scholarly) work, Tim and Peter Birkin, his chemistry colleague at Southampton, were awarded the 2011 Brian Mercer Award for Innovation by The Royal Society, and the 2012 Institute of Chemical Engineering Award for Water Management and Supply for their work on developing an ultrasonic cleaning device.

The English language is replete with superlatives that aptly describe people like Tim Leighton, but four stand out: *imaginative*, for his approach to science and education, *resilient*, for his ability to soldier on in the face of adversity, *efficient*, for his ability to accomplish more in less time than most, and *inquisitive*, as epitomized by his eclectic research portfolio. These attributes combine to make Timothy G. Leighton an exemplary recipient of the Helmholtz-Rayleigh Interdisciplinary Silver Medal "for contributions to physical acoustics, biomedical ultrasound, sonochemistry, and acoustical oceanography."

ROBIN O. CLEVELAND
LAWRENCE A. CRUM
RONALD A. ROY
PETER R. BIRKIN