

ACOUSTICAL SOCIETY OF AMERICA

GOLD MEDAL



Whitlow W. L. Au

2016

The Gold Medal is presented in the spring to a member of the Society, without age limitation, for contributions to acoustics. The first Gold Medal was presented in 1954 on the occasion of the Society's Twenty-Fifth Anniversary Celebration and biennially until 1981. It is now an annual award.

PREVIOUS RECIPIENTS

Wallace Waterfall	1954	Ira J. Hirsh	1992
Floyd A. Firestone	1955	David T. Blackstock	1993
Harvey Fletcher	1957	David M. Green	1994
Edward C. Wentz	1959	Kenneth N. Stevens	1995
Georg von Békésy	1961	Ira Dyer	1996
R. Bruce Lindsay	1963	K. Uno Ingard	1997
Hallowell Davis	1965	Floyd Dunn	1998
Vern O. Knudsen	1967	Henning E. von Gierke	1999
Frederick V. Hunt	1969	Murray Strasberg	2000
Warren P. Mason	1971	Herman Medwin	2001
Philip M. Morse	1973	Robert E. Apfel	2002
Leo L. Beranek	1975	Tony F. W. Embleton	2002
Raymond W. B. Stephens	1977	Richard H. Lyon	2003
Richard H. Bolt	1979	Chester M. McKinney	2004
Harry F. Olson	1981	Allan D. Pierce	2005
Isadore Rudnick	1982	James E. West	2006
Martin Greenspan	1983	Katherine S. Harris	2007
Robert T. Beyer	1984	Patricia K. Kuhl	2008
Laurence Batchelder	1985	Thomas D. Rossing	2009
James L. Flanagan	1986	Jiri Tichy	2010
Cyril M. Harris	1987	Eric E. Ungar	2011
Arthur H. Benade	1988	William A. Kuperman	2012
Richard K. Cook	1988	Lawrence A. Crum	2013
Lothar W. Cremer	1989	Brian C. J. Moore	2014
Eugen J. Skudrzyk	1990	Gerhard M. Sessler	2015
Manfred R. Schroeder	1991		



CITATION FOR WHITLOW W. L. AU

. . . for contributions to understanding underwater biosonar, and for service to the Acoustical Society

SALT LAKE CITY, UTAH • 25 MAY 2016

Whitlow Au received a B.S. degree in Electrical Engineering in 1962 from the University of Hawaii and M.S. and Ph.D. degrees in Electrical Engineering from the University of Washington in 1964 and 1970. His research was specialized on propagation of radio signals in the ionosphere, and in magnetosphere physics. From 1964 to 1968, he worked as a research and development project officer and engineer at the U.S. Air Force Weapons Laboratory in New Mexico, focusing on the passage of radar signals through the plasma sheath that surrounds reentry vehicles. Beginning in 1970, Whit became involved in acoustics as Scientist for the Naval Ocean Systems Center in San Diego, dealing with theoretical aspects of acoustic propagation. He moved to Hawaii in 1971 as Senior Scientist for the Naval Ocean Systems Center, where he did seminal research on dolphin biosonar as well as a wide variety of allied work in underwater sound propagation, acoustic backscatter, digital and analog signal processing, and associated electronics. His 1993 book, *The Sonar of Dolphins*, plus over 50 papers at the time along with numerous meeting abstracts, the majority in the *Journal of the Acoustical Society of America* (JASA), were major products of that period in his professional life. Among these, there is an interesting deviation into Hawaiian katydid sounds in an abstract from 1992 (JASA 92, Pt. 2, 2423) with J. Strazanac. He has published an important study of noise levels in the ocean, *Marine Mammal Populations and Ocean Noise: Determining When Noise Causes Biologically Significant Effects* (The National Academies, 2005). More recently, Whit and Mardi Hastings published their book, *Principles of Marine Bioacoustics*, in 2008.

In 1993, the Navy facility moved to San Diego, and the dolphin work in Hawaii transferred to the Hawaii Institute of Marine Biology, where Whit has served as Senior Scientist since then. During both his San Diego and Hawaii periods, Whit has made a series of major technical and conceptual contributions to Animal Bioacoustics in the study of biosonar in dolphins. In the course of his work, Whit has received the Navy Meritorious Civilian Service Award (3rd highest national award for a Navy civilian employee) for contributions in dolphin bioacoustics in 1986 and Publication Awards from the Naval Ocean Systems Center in 1990, 1991, and 1992. Much of the technical interest in biosonar comes from the underwater sonar concerns of the U.S. Navy, for which Whit has worked on program planning and evaluation for the Office of Naval Research (ONR) and the Ocean Studies Board of the National Research Council for the National Academies.

In 1998, Whit was awarded the Acoustical Society of America Silver Medal in Animal Bioacoustics for his technical contributions to understanding the biosonar of cetaceans. This award specifically recognized his leading role in transforming much of the loosely-structured research about echolocation in cetaceans into a solid, comprehensive body of knowledge that has both scientific and technological importance. His book, *The Sonar of Dolphins* in 1993, and a new historical review in *Acoustics Today*, in the fall 2015 issue, are the best comprehensive and summary entry points for anyone seeking to understand underwater biosonar. In 2007, Whit co-authored a comparative summary of dolphin and bat biosonar for *Physics Today* with James Simmons. During Whit's career, he has published over two hundred scientific papers.

Whit has been an influential leader in the Acoustical Society of America. His service has included being a founder, member (1989-1994), and chair of the Technical Committee on Animal Bioacoustics (1997-2000) and a member of the Executive Council (2001-2004). He was elected Fellow in 1990 and served as Vice President (2006-2007) and President (2009-2010). Since 1998 he has served as an Associate Editor of JASA for Animal Bioacoustics. In his capacity as ASA President, he was also a member of the Council of Scientific Society Presidents. For facilitating scientific exchange, he organized and chaired

special sessions in Psychological and Physiological Acoustics or Animal Bioacoustics at ASA meetings in San Diego (1983), Hawaii (1988), Houston (1991), and Austin (1994). He was a member of the organizing committee for the joint Acoustical Society of America/Acoustical Society of Japan (ASJ) meeting held in Hawaii in 1996, ASA Chair of the Joint ASA/ASJ meeting in 2006, and the ASA Chair for Acoustics 2012 Hong Kong.

The intellectual clearinghouse of research on biosonar has been a series of major international conferences held roughly every decade. Whit was a member of the organizing committee for the meeting held on Jersey, Channel Islands (1979), the meeting in Helsingor, Denmark (1986) and the meeting in Kyoto, Japan (2008). The Society has sponsored several large-scale workshops on Acoustic Communication by Animals, including at the University of Maryland and Cornell University. Whit was a co-organizer for the meeting at Oregon State University, Corvallis, in 2008. For marine mammal bioacoustics, he was on the organizing committee and a session chairman for the International Symposium on Sensory Systems and Behavior of Aquatic Mammals, held in Moscow, Russian Federation, in 1991, and on the organizing committee for the 13th Biennial Conference on the Biology of Marine Mammals, held in Wailea, Hawaii, in 1999.

Whit's most lasting act of service to the Society has been to create the Animal Bioacoustics Technical Committee, around which has coalesced much of the Society's current activity in research on the uses of sound by animals. This happened at a critical time in the history of the Society, and it was instrumental in preserving the central role of the Society for representing acoustics in biology. Up until about 1980, the Society was unchallenged as the "go-to" place for research on the sense of hearing and its mechanisms, embodied in the meeting sessions of the Psychological and Physiological Acoustics Technical Committee. Then, a parallel scientific association developed around this area emphasizing the clinical implications of research on hearing, which by 1980 had begun to draw much of this activity away from the Acoustical Society. Whit rescued the central role of the Society when he carved out the Animal Bioacoustics area as a separate entity. This technical committee has continued the large, comparative study of hearing and sound production within the Society. The importance of sound for animals is such that the Society's presence is crucial for its mission representing this area.

In sum, Whit has made outstanding contributions to all of our shared enthusiasms for acoustics at both the technical and the institutional levels, which makes him an excellent recipient of the Society's Gold Medal.

JAMES A. SIMMONS