Inspiring the Next Wave

William Kuperman's Legacy for Young Scientists

1943 — 2024

Bill Kuperman's Scientific Journey

Early Life and Education: Born in **New York City** in **1943**, Prof. Kuperman earned his bachelor's degree from the Polytechnic Institute of Brooklyn in 1965, a master's from the University of Chicago in 1966, and a **Ph.D.** from the University of Maryland in 1972.

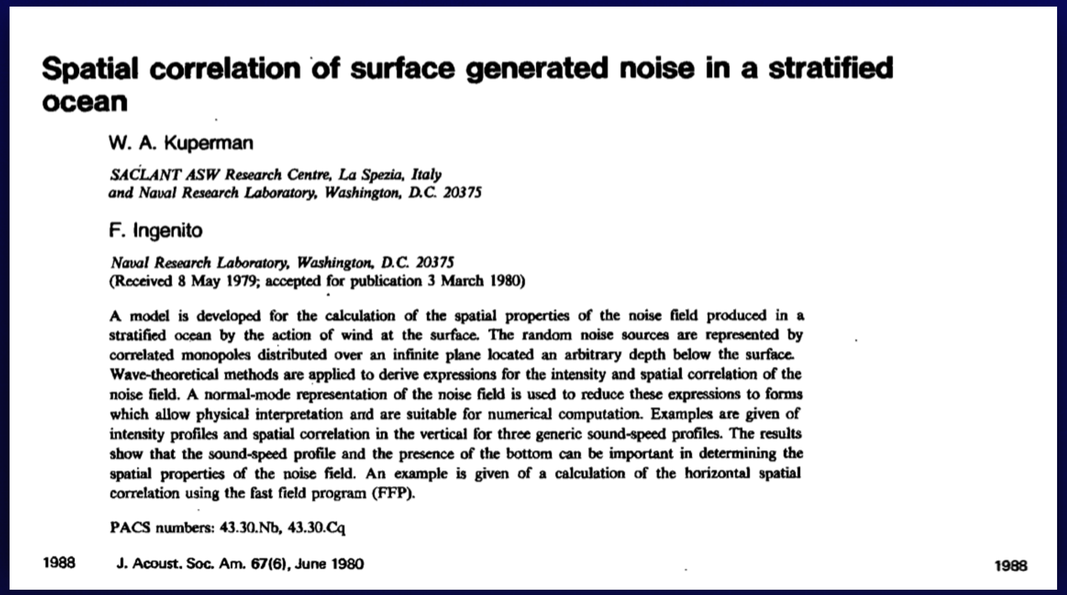
Professional Milestones:

1967 **US Naval Research Laboratory**: Conducted pioneering research in underwater acoustics.

1976 NATO **SACLANT** ASW Undersea Research Centre (Italy): Led significant projects in ocean acoustics.

1981 **N**aval **O**cean **R**esearch and **D**evelopment **A**ctivity (Mississippi): Advanced oceanographic research.

1993 Scripps Institution of Oceanography (California): **Director of the Marine Physical Laboratory** until 2020; later became Emeritus Professor.



Spatial correlation of surface generated noise in a stratified ocean

W. A. Kuperman

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(Received 8 May 1979; accepted for publication 3 March 1980)

A model is developed for the calculation of the spatial properties of the noise field produced in a stratified ocean by the action of wind at the surface. The random noise sources are represented by correlated monopoles distributed over an infinite plane located an arbitrary depth below the surface. Wave-theoretical methods are applied to derive expressions for the intensity and spatial correlation of the noise field. A normal-mode representation of the noise field is used to reduce these expressions to forms which allow physical interpretation and are suitable for numerical computation. Examples are given of intensity profiles and spatial correlation in the vertical for three generic sound-speed profiles. The results show that the sound-speed profile and the presence of the bottom can be important in determining the spatial properties of the noise field. An example is given of a calculation of the horizontal spatial correlation using the fast field program (FFP).

PACS numbers: 43.30.Nb, 43.30.Cq

Career Achievements

Honors and Awards:

1995 *Pioneers of Underwater Acoustics Medal,* Acoustical Society of America.

2003 ~ *Secretary of the Navy/Chief of Naval Operations Chair for Ocean Science.*

2004 *National Academy of Engineering* member for leadership in **computational ocean acoustics.**

2011 *Walter Munk Award* for contributions to **understanding sound propagation in the ocean.**

2012 *Gold Medal, Acoustical Society of America* for leadership in **underwater acoustics and mentorship.**

Contributions to Science:

Co-authored the foundational textbook "**Computational Ocean Acoustics**," significantly advancing the field.

Pioneered **matched-field processing**, a breakthrough technique for source localization and environmental inversion in ocean acoustics.

Made significant advances in **time-reversal acoustics**, **underwater acoustic communications**, **adjoint methods**, **global sound propagation**, and **waveguide invariants.**

International Collaboration

November 11–13, 2013, Kaohsiung, Taiwan

Acoustic Model and Data-Based Signal Processing

W. A. Kuperman and Hee Chun Song
Scripps Institution of Oceanography
University of California, San Diego

Taiwan, November 2013

Keynote speech at WUWNet' 13

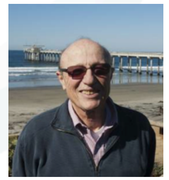
國立臺灣大學 海洋研究所
Institute of Oceanography, National Taiwan University

日　期	時　間	地　點
2013年11月14日 (星期四)	2:20 pm ~ 3:10 pm	海研所 二樓大講堂

Noise is also a Signal

W. A. Kuperman
Marine Physical Laboratory of the Scripps Institution of Oceanography
University of California, San Diego

Ocean noise has typically been treated as unwanted interference in the context of detecting signals. However, more recently, noise has itself also become a signal of interest in which, for example, ocean or geophysical properties are embedded in the noise field. There is now significant ongoing research in trying to extract environmental information from noise. Much of the latter has utilized man-made noise, surface generated noise, biological noise or seismic noise. In this talk, a brief review of the transition of some noise research to a new focus on useful aspects of noise will be given.



William A. Kuperman is a professor at the Scripps Institution of Oceanography, University of California, San Diego and the director of its Marine Physical Laboratory. As a researcher in underwater acoustics and signal processing he has spent about three years at sea. He is a past president of the Acoustical Society of America, a coauthor of the textbook Computational Ocean Acoustics and a member of the U.S. National Academy of Engineering.

Special Seminar at IONTU, Taipei

HungHwa Teppanyaki, 2018/4/15

Impact on Education and Mentorship

Believed that “in a research environment, **51% of the product is the scientist,** and the research results will follow," — focused on **developing people**, not just results.

Encouraged students to **push boundaries** and **engage in real-world experiments**.

His influence is seen in the **SPC today**, reflecting his **teaching philosophy**.

Enduring Legacy

His **scientific impact** lives on through **his students and their research**.

The **innovation** in today's student poster presentations reflect his approach.

*Continue his legacy by fostering **curiosity**, **mentorship**, and **excellence**.*