

PATERSON



Timothy Leighton
University of Southampton

The Paterson medal and prize, for outstanding contributions by a physicist early in their career to the application of physics and its commercial exploitation, has been awarded to Timothy Leighton for his contributions to the field of acoustics in liquids, in particular to biomedical ultrasonics, acoustical oceanography, cavitation and industrial ultrasonics.

Timothy Leighton's contribution is outstanding in both breadth and depth. He is an acknowledged world leader in four fields relating

to acoustics in liquids: biomedical ultrasonics, cavitation, acoustical oceanography and industrial ultrasonics. He has delivered more than 70 pioneering advances, from devices used in hospitals to the world's first count of bubbles in the surf zone (crucial to understanding atmosphere-ocean gas flux, coastal erosion and the optimisation of military sonar).

Behind these advances lies rigorous physics: his oceanic work, for example, involved the discovery of a new ultrasonic signal and the understanding of its mechanism of generation. This was necessary before he could devise calibrations for the measurement device and incorporate it into an ocean-going rig capable of withstanding the energetic pounding of ocean waves.

Leighton's research has led to an improved ability to predict the performance of high-frequency

sonars in the challenging coastal environments of modern naval warfare. He worked on the team that developed the world's first 3D sub-bottom profiler, which has been used for geophysics and marine archaeology. He has developed perhaps the only acoustic technique for measuring very dense bubble populations, like those found in the rough surf zone. He developed ultrasonic prototypes that are used in potteries around Europe for quality control; in production lines for pharmaceuticals and food; and in hospitals to monitor the treatment of kidney disease and osteoporosis.

His research has also contributed to measurement guidelines for foetal scanning, quality control in ultrasonic cleaning-bath manufacture and sonochemical reactors.