



# The Acoustic Bubble

*By T. G. Leighton*

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"This volume deals with the interaction of acoustic fields with bubbles in liquids, with emphasis on the principles of cavitation--the generation of bubbles in liquids by rapid changes, such as those introduced by ultrasound. When cavity bubbles implode they produce shock waves in the liquid. If cavitation is induced by turbulent flow, components can be damaged. These phenomena have important implications, particularly in underwater acoustics, one of the fastest growing fields in acoustics research. **The Acoustic Bubble** skillfully explains the physical processes involved in cavitation both by analogy and formulation, making the concepts accessible to those with a minimal background in mathematics. This book will be of great interest to those engaged in research in a wide range of areas, from sonochemistry to the sensitization of explosives.

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## **The Acoustic Bubble** By T. G. Leighton Bibliography

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## Editorial Review

### Review

"One can only effervesce with praise upon perusing **The Acoustic Bubble**, by T.G. Leighton. Here is a volume that is both comprehensive and readable--that informs the expert and the novice....The reader is well served by the authors careful attention to detail, his extensive table of symbols (14 pages!), his excellent use of photographs and graphics, an extraordinarily comprehensive bibliography, and, most of all, by his lucid physical descriptions of phenomena not only having to do with bubbles but also with a variety of physical systems that are related to foundations of the sciences that one must understand if one is to apply them to the bubble problem....**The Acoustic Bubble** is not only interesting reading; it is an extraordinarily useful reference for those working in or planning to work in the field....Theres no trouble with this Bubble."

--JOURNAL OF THE ACOUSTIC SOCIETY OF AMERICA

"The strength of this book lies in its effortless and enjoyable coverage of a wide swathe of rather intimidating literature and its unified mathematical approach....undoubtedly a major contribution to the field by an accomplished teacher, scientist and enthusiast."

--PHYSICS IN MEDICINE AND BIOLOGY

"There is no doubt that this is the most comprehensive and accessible text on acoustic cavitation available....This is a required reference for scientists and, in particular, medical physicists interested in becoming acquainted with the mathematical description of bubble dynamics and the wealth of associated physical phenomena. It is user friendly, thorough in its treatment of the theory and encyclopedic in its coverage of the experimental literature. I have no doubts that it will become a standard text."

--SCOPE (THE JOURNAL OF THE IPSM)

### From the Back Cover

The wide range of important applications concerning the acoustic interactions of bubbles necessitates a book of this form which, utilising analogy, description, and formulation, gives a 'physical feel' for the phenomena, whilst also providing thoroughly for mathematically adept readers.

The first half of the book introduces and draws together acoustics, cavitation nucleation and associated fluid dynamics, to examine the free oscillations of bubbles and the resulting acoustic emissions. In the second half, the behaviour and consequences of bubbles in externally-applied acoustic fields is discussed in detail, including the cavitation aspects of erosion and bioeffects.

Throughout the book topics drawn from a variety of disciplines, and include:

- . Bubble and cavitation detection
- . Bioeffects of clinical ultrasound
- . Oceanic bubble populations
- . Sonochemistry
- . Ultrasonic degassing
- . Weather sensing

There is an extensive bibliography.

## About the Author

T G Leighton is the Lecturer in Underwater Acoustics at The Institute of Sound and Vibration Research, University of Southampton.

## Users Review

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