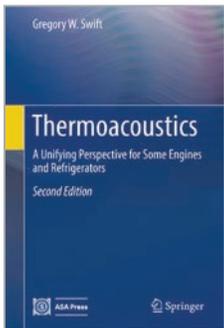


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Thermoacoustics A Unifying Perspective for Some Engines and Refrigerators



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106 b/w illustrations, 26 color illustrations

Topics: Acoustics

This updated new edition provides an introduction to the field of thermoacoustics. All of the key aspects of the topic are introduced, with the goal of helping the reader to acquire both an intuitive understanding and the ability to design hardware, build it, and assess its performance. Weaving together intuition, mathematics, and experimental results, this text equips readers with the tools to bridge the fields of thermodynamics and acoustics. At the same time, it remains firmly grounded in experimental results, basing its discussions on the distillation of a body of experiments spanning several decades and countries.

The book begins with detailed treatment of the fundamental physical laws that underlie thermoacoustics. It then goes on to discuss key concepts, including simple oscillations, waves, power, and efficiency. The remaining portions of the book delve into more advanced topics and address practical concerns in applications chapters on hardware and measure-

ments. With its careful progression and end-of-chapter exercises, this book will appeal to graduate students in physics and engineering as well as researchers and practitioners in either acoustics or thermodynamics looking to explore the possibilities of thermoacoustics. This revised and expanded second edition has been updated with an eye to modern technology, including computer animations and DeltaEC examples.

About the Author

Greg Swift received his PhD in physics at the University of California at Berkeley in 1980, and has worked in the Condensed Matter and Thermal Physics Group at Los Alamos National Laboratory (LANL) ever since. He is a Fellow of the Acoustical Society of America, of the American Physical Society, and of LANL. He received the Acoustical Society's Silver Medal in Physical Acoustics in 2000, an award that has been given, on average, only every three years. He received the US Department of Energy's E.O. Lawrence Award in 2004, in the category of Environmental Science and Technology. The main focus of Greg's research has been the invention and development of novel energy-conversion technologies. He enjoys the thermodynamics of heat engines and refrigerators, the thermodynamics of non-ideal-gas fluids, physical acoustics, hydrodynamics, and low-temperature physics. He hopes that thermoacoustic engines and refrigerators will play a meaningful role in the energy economy of the 21st century.

At Los Alamos, Greg has mentored two Master's students, three Ph.D. students, and 13 postdocs, and enjoyed significant partnerships with ten corporate collaborators. He is co-author (or, occasionally, sole author) of about 100 articles in refereed journals and conference proceedings. He is responsible for two dozen patents, and the thermoacoustics design and analysis software most commonly used world-wide—DeltaEC.