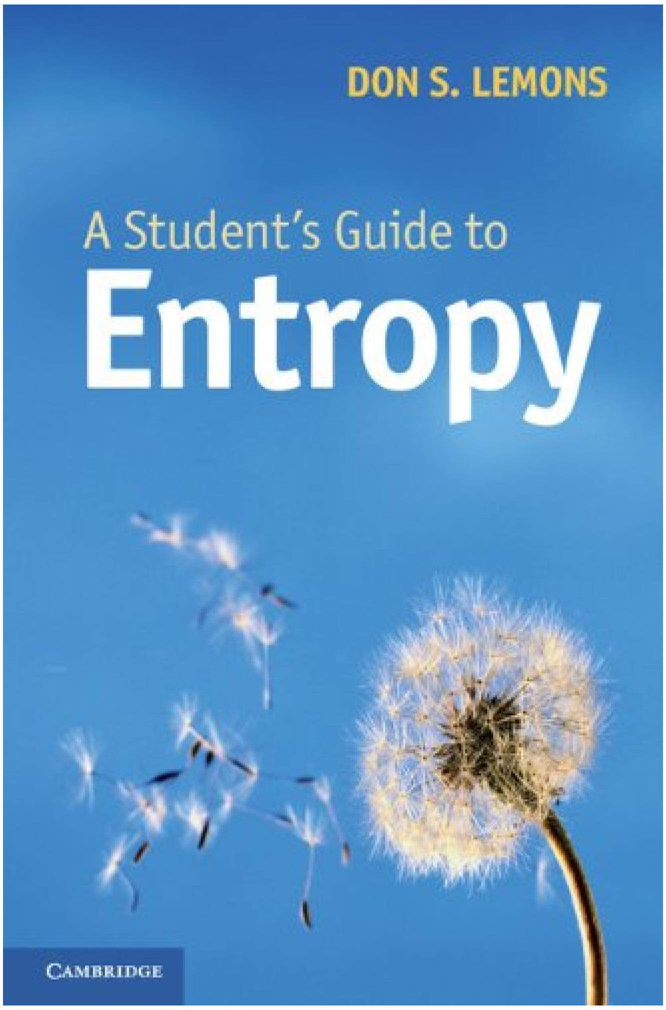
A Student's Guide To Entropy



Synopsis

Striving to explore the subject in as simple a manner as possible, this book helps readers understand the elusive concept of entropy. Innovative aspects of the book include the construction of statistical entropy from desired properties, the derivation of the entropy of classical systems from purely classical assumptions, and a statistical thermodynamics approach to the ideal Fermi and ideal Bose gases. Derivations are worked through step-by-step and important applications are highlighted in over 20 worked examples. Around 50 end-of-chapter exercises test readers' understanding. The book also features a glossary giving definitions for all essential terms, a time line showing important developments, and list of books for further study. It is an ideal supplement to undergraduate courses in physics, engineering, chemistry and mathematics.

Book Information

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Customer Reviews

Do not be misled by the description that appears on the book's back cover: "striving to explore the subject in as simple a manner as possible". The statement is accurate (as far as it goes) but requires an important caveat: entropy and thermodynamics are mathematically driven subjects and require math for an in depth discussion. Any discussion of entropy without mathematics can offer only a narrow conceptual overview which will inevitably be inadequate. However, there are two fine books published by Dover (at low Dover prices) that are quite helpful in offering a solid introduction. They contain some math but quantitatively less than A Student's Guide to Entropy. The books are Understanding Thermodynamics (Dover Books on Physics) by H. C. Van Ness and Thermodynamics (Dover Books on Physics) by the great Italian Physicist Enrico Fermi. An entirely conceptual discussion which leaves out any material that requires mathematics for understanding or for conceptual derivation is The Second Law (Scientific American Library) by P. W. Atkins, originally published in the Scientific American Library. It is a bit dated and leaves out a lot of important material, but there is no mathematics and it is a nice, clearly written introduction to the single most important concept in all of science.

Many--- might I say most--- physics textbooks have major flaws. Some have no worked examples in the text. Some have partial or no derivations (cf. the evil "derivation left to the reader.") Others have no practice problems. Of those that do have problems, many don't provide solutions. Finally, many are extremely obtuse in their explanations; they simply can't explain things well.This textbook, "A Student's Guide to Entropy" by Don S. Lemons, avoids (almost) all of these pitfalls. Other than one minor reservation that I have (which I'll mention later,) I felt that this was an almost perfect example of what a good textbook should be! (You do need integral and derivative calculus and an understanding of infinite series; if you don't have an understanding of this math, this book is not for you.)The author (an emeritus professor of physics) has spent many years doing research on the very topics in this book. While that is certainly a good thing--- he's an expert, and it's nice knowing that you're learning from an expert--- it is not a SUFFICIENT thing for writing a good textbook. What is needed, really, is an understanding and memory of what it was like BEFORE you understood those things you're an expert in--- and the ability to explain these topics clearly to those who don't yet understand them. Many experts have no ability at all to explain or convey their ideas in this fashion. Don Lemons does.Here are the details:The topic of the book is entropy (duh!) Entropy is one of the slipperiest concepts in physics. It has several definitions which seem, at first, to not be related to one another.

Entropy - God's Dice Game: The book describes the historical evolution of the understanding of entropy, alongside biographies of the scientists who ... communication theory, economy, and sociology A Student's Guide to Entropy A Farewell To Entropy Statistical Mechanics: Entropy, Order

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