Título: Elementary Principles In Statistical Mechanics: Developed With Especial Referenc

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Precio: $384.00

Editorial:

Año: 2012

Tema:

Edición: 1ª

Sinopsis

ISBN: 9781407782546

Josiah Willard Gibbs (1839-1903) was the greatest American mathematician and physicist of the nineteenth century. He was a pioneer of vector analysis, but his deepest work was in the development of thermodynamics and statistical physics. This book, first published in 1902, gives his mature vision of these subjects. --This text refers to an alternate Paperback edition.
Published in 1901, this is a seminal work in statistical mechanics that set the stage for all later development of the subject.

It is not easy to read for several reasons.

First, the typesetting has been taken from the original 1901 plates which have not worn well in some places. The printing itself is of high quality, but as the typeface is rather small and very small for footnotes, some characters are very hard to make out.

Second, Gibbs, being a product of the nineteenth century, has a tendency towards the grandiloquent and the use of sentences that are overly long.

Third, Gibbs' approach with classical mechanics and mathematical notation, particularly with respect to partial derivatives, is dated.

Finally, the subject matter is rather challenging in and of itself.

Nonetheless, it is quite nice to actually read the words of the master for one's self. This book is referred to so often in later works that reading it is almost a necessity for the serious student of the subject at some point.

Essentially, this book is a deep, probing, and very logically constructed look at canonical ensembles. Indeed, this is the book where canonical ensembles were defined in the first place.

Naturally, the treatment is completely classical as quantum mechanics didn't even exist when this book was written.

It is quite interesting to see the justification that Gibbs provides for introducing the law of canonical distribution, namely that it is simple and leads to strong analogies with thermodynamics. That is, Gibbs does not in any way attempt to justify it on the basis of classical mechanics itself.

The interested student should have a strong background in classical mechanics, particularly Hamilton's formulation, and thermodynamics, and should definitely not be trying to learn statistical mechanics for the first time.

Still valuable and thought provoking, but not absolutely essential.