preferred media sources, and they give detailed instructions on how to attain that end and thereby influence public discourse on controversial topics with a science context. If you want to put in your two cents on nuclear power, stem-cell research, directed-energy weapons, or the creation of new life forms in the laboratory, and if you have the necessary expertise to do so, this book is for you.

But even if you prefer to remain safely cloistered in the peaceful halls of academia, you may nevertheless benefit from what Hayes and Grossman have to say. In my experience, much of the way the media operate is counterintuitive to physicists. When 95% of experts in a field agree on a topic, reporters will quote one or more of them, but may also include remarks by someone whose work is not taken seriously by fellow professionals but who is chosen because he or she disputes the majority position. To some journalists, that approach provides needed "balance." Usually when a reporter calls a scientist to ask a question, the journalist actually wants to know the answer. Yet it's also common for a reporter to know what answer he or she wishes to quote and call a scientist who is likely to take that position.

The book also discusses the art of writing good press releases. A scientist who writes an article begins by introducing the subject of the research and may make the error of following that practice in drafting a press release about the results. A communications professional knows that a press release must begin with the bottom line: What was discovered? The context then follows. Hayes and Grossman even advise scientists to speak in clichés during certain media interactions. It's contrary to what we were taught in school, but the approach is sometimes appropriate, as the authors cogently explain. All of these "crazy" practices, as physicists might say, are in accord with the rules of journalism.

All kinds of journalists work in different ways, and it helps to know the differences, too. Talking "on background" implies various rules on how reporters use the information, depending on their affiliations. A local television news correspondent arrives at your office, records a quick stand-up interview, and is gone in 15 minutes. The resulting sound bite of your comments will last about 20 seconds on the nightly news. Another reporter may spend a day with you and write a feature article.

Hayes and Grossman note that many researchers are critical of the daily press: Scientists don't like the selection of science topics, the singling out of a few scientists for comment, the omission of prior research, and the loose way in which the carefully nuanced conclusions of a research paper are expanded to broad, new contexts. Many researchers think that scientific significance should be the prime criterion for featuring a research result in the mass media, and they don't understand why it emphatically is not. But such critics should realize that when it comes to newspapers, "if there were a paper written the way they would like it, nobody would read it," according to a British scientist quoted in Hayes and Grossman's book. If researchers read *A Scientist's Guide to Talking with the Media*, it will help them to understand.

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Concepts in Thermal Physics

Stephen J. Blundell and
Katherine M. Blundell
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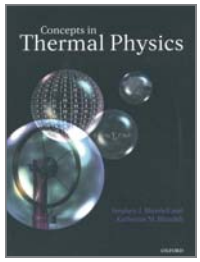
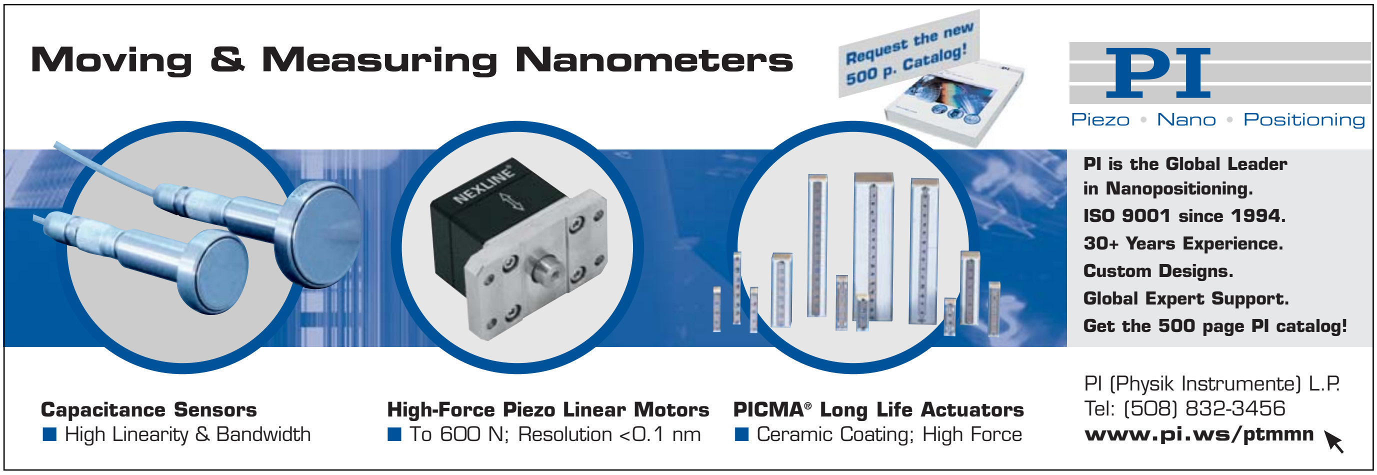


Students' first exposure to statistical mechanics and thermodynamics is always tricky. The mathematical machinery is quite simple, but the concepts are somewhat outside the framework set up in other physics courses. Moreover, with so many results derived from so few assumptions, it is important that the presentation be clear and logical. *Concepts in Thermal Physics* by Stephen J. Blundell and Katherine M. Blundell fulfills that need admirably, and their textbook will be very useful for an undergraduate course in thermodynamics and statistical mechanics.

The authors, who teach in the physics department at Oxford University, first cover basic statistical ideas, then discuss thermodynamics before returning to statistical mechanics. The approach is a good choice: Thermodynamics can—with a few experimental inputs—be applied in a broad range of disciplines to complex systems for which statistical analyses would be impractical. It is important for physics instructors to not lose sight of that generality. To treat thermodynamics as merely an application of statistical mechanics is analogous to treating elasticity theory as just an application of atomic interactions. However, those who favor beginning with statistical mechanics first, as it is more fundamental and therefore easier to understand, may prefer the second edition of *Thermal Physics* by Charles Kittel and Herbert Kroemer (W. H. Freeman, 1980).

I also like the fact that the first physical system discussed in the text is a gas rather than a spin chain—the former is associated more with everyday experience. Although the calculations for a spin system are simpler, the treatment of gases is also easy to understand. On a related note, several figures in the



book contain actual experimental data, which are welcome because they make the discussions more relevant. Some figures that seem to include experimental data do not have any references (for example, 9.12). Such omissions should be corrected.

The 37 chapters are short, and each covers a single concept. In general, I found the presentation remarkably clear. But there are exceptions: The discussion of magnetic systems—including the change from $B\,dm$ to $m\,dB$ (in which m is the magnetic moment and B is the magnetic field)—is far too short, as is the coverage of how molecular degrees of freedom freeze out. I do not think the chapter on information theory will be useful to readers who do not already know the material. The chapter on photons is unnecessary because all the results can be obtained more efficiently through statistical mechanics rather than through classical thermodynamics, as the authors reveal in a subsequent chapter. And the characterization of heat as "energy in transit" is quite misleading.

Of more serious concern is the chapter on phase transitions, which is extremely outdated. With a numerical treatment of simple examples, such as percolation and the Ising model in two dimensions, it should be possible for a textbook to explain the fundamental concept that a phase transition is a qualitative change that is apparent only at the macroscopic level. It should also be possible to introduce the basic idea of scaling at second-order phase transitions and provide a short discussion of Monte Carlo simulations. Unfortunately, the Blundells' coverage falls short; thus, instructors will have to provide supplemental material on the topic.

The section on kinetic theory is interposed before the treatment of thermodynamics. The authors point out that teaching the section is optional and can be delayed or omitted. Apart from the section's first two chapters, their suggestion is useful, particularly if the book is used in a one-term course. But in any case, it would be helpful if the book were to clearly explain where in the section the ideal-gas approximation is made. For instance, I could not find any discussion of why the treatment of pressure in chapter 6 is only valid for ideal gases, which is not the case for the Maxwell–Boltzmann distribution as described in chapter 5.

Although the problems at the end of each chapter are well chosen, it would help if more were included, especially problems that apply the concepts to different disciplines. The chapters on special topics that discuss applications are nice, but unfortunately they will likely be dropped in a one-term course. Overall, *Concepts in Thermal Physics* provides an excellent introduction to thermodynamics and statistical mechanics. It deserves serious consideration as a textbook for any undergraduate course on those topics. And the fact that a reasonably priced paperback edition is also available will be welcome news for students.

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