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Book Review: *Contemporary Problems in Statistical Physics*

Contemporary Problems in Statistical Physics. G. H. Weiss, ed., SIAM, Philadelphia, 1994.

This volume, to quote from the Preface, "is meant to introduce the applied mathematician to problems of contemporary interest in the physical sciences without an extensive background in statistical physics." It attains this goal in an admirable fashion due to the choice of topics covered and the authors of the five chapters.

In Chapter 1, there is a discussion of diffusion kinetics in inhomogeneous systems by P. Clifford and N. J. B. Green. In Chapter 2, M. Dykman and K. Lindenberg cover fluctuations in nonlinear systems driven by colored noise. Chapter 3 includes a treatment of percolation by S. Havlin and A. Bundle. Aspects of trapping in transport processes are treated by F. D. Hollander and G. H. Weiss in Chapter 4. Finally, F. Moss presents a masterly discussion of stochastic resonance in Chapter 5.

The treatments are aimed at readers who are not specialists in molecular science but who are familiar with probability theory and stochastic differential equations. The discussions are on a mesoscopic and/or macroscopic level. More detailed treatments of the molecular foundations of the phenomena described here would not be useful for the intended audience.

This is a fine book for advanced undergraduates, graduate students, and researchers in applied mathematics. Indeed, the chapters are so well written that many-body theorists in physics and chemistry will enjoy and learn from them. The only caveat that one must add is that no matter how beautiful the mathematics is, the scientist must deal with the physical properties of matter and the physical relevance of the mathematics.

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