

angular momentum is discussed in depth in a separate chapter on symmetries. There is a brief discussion of particle statistics and second quantization, but no relativistic quantum mechanics. Two chapters on approximation methods cover most of the usual material, with interesting sections on the origins of van der Waals interactions, excitons and other applications.

While the selection of material covered is quite good, I found the pedagogy in these early chapters lacking. All too often, the discussion of basic material feels rushed, and the author's interest seems to lie with the more applied and advanced material to come. This text probably would be heavy going for the average graduate student and confusing for the student with weak preparation.

Specifically, I found the development of many important basic concepts erratic and confusing. Fundamental topics are often introduced without adequate explanation, including Fourier transforms, the uncertainty principle, boundary conditions, state vectors and stationary states. For example, basis sets are introduced and used several pages before they are defined fully; students must wait even longer to learn about geometrical analogies or the importance of energy eigenfunctions. The unclear description of the variational method could easily leave the student confused about whether the trial wavefunctions used are already eigenfunctions of the Hamiltonian.

Basic concepts such as band structure and effective mass, as well as the physics of semiconductor devices, are not adequately explained for the intended audience. As a result, many of the applied problems following each chapter will be very difficult for first-year graduate students. In general, the emphasis on complicated problems from solid state rather than on standard exercises in basic quantum mechanics makes for an overly difficult first encounter with the subject. Also, a significant number of typographical errors and related problems were apparent on a first reading, including confusing mathematical notation, which often does not discriminate between vectors, scalars and operators.

While I would not recommend this book as a text, readers will find many interesting sections on device physics and topics in solid state, with actual numbers provided for mapping basic exercises in quantum mechanics onto problems of technological interest.

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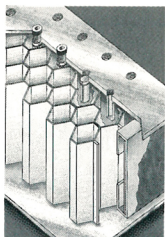
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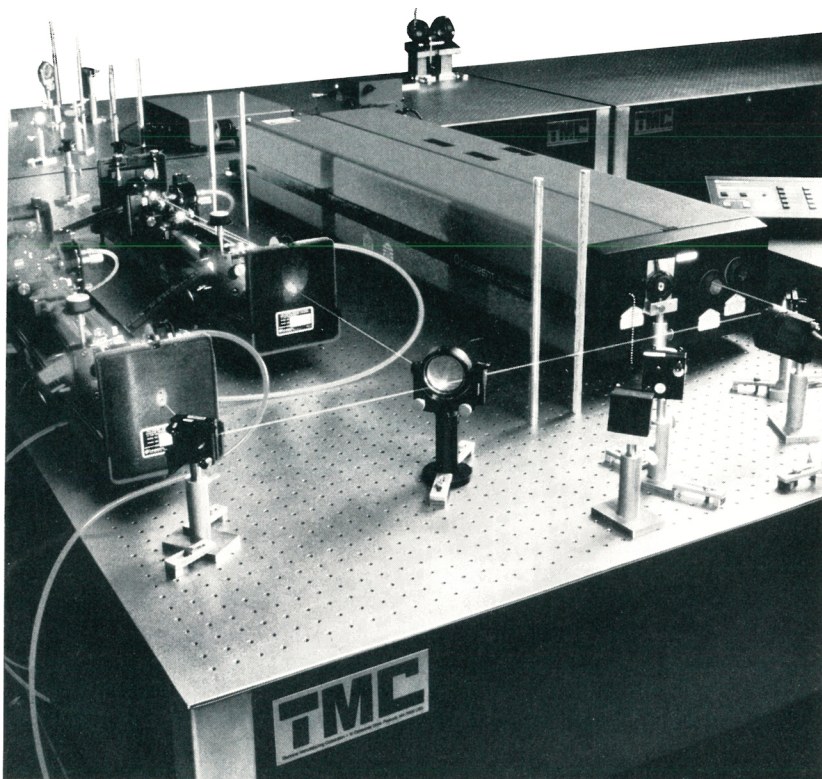
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