the Reformation) to varying rates of meteoric phenomena. In dynamics, Steel espouses the extraordinary idea that "the main [asteroid] belt is not being depleted to supply meteorites and Earth-crossing asteroids, but quite the opposite." Steel asserts that the main belt is growing, thus reversing "time's arrow." Elsewhere he devotes many pages to an original theory that Stonehenge is a monument inspired by a rain of meteors and comets over prehistoric England. Perhaps some of these unorthodox ideas are deserving of serious scientific discussion, but their inclusion as fact in a popular-level book detracts significantly from its overall value.

The contrast between these two books is thought provoking. Both are well written, are by reputable scientists, cover essentially the same topics at the same level and were released by major publishers within a few months of each other. Yet one is accurate and authoritative, while the other digresses so frequently into speculation that it cannot be trusted as a reliable source of information.

Modern society has a preoccupation with calamity and a growing intolerance for risk in any form. Since public concern over impacts is fueled by the appearance of bright comets (such as Hale–Bopp in the spring of 1997), the well-publicized 1994 collision of the comet Shoemaker–Levy 9 with Jupiter and continuing reports of asteroidal "near misses," we can expect more books on this topic in the future. Sooner or later, we may well have to assess the value and efficacy of proposed defensive systems. It may also become essential to ask how the risks inherent in maintaining a nuclear asteroid defense system compare with the actual threat it is designed to mitigate. Lewis's book provides an excellent starting point.

Quantum Field Theory in Condensed Matter Physics

Alexi M. Tsvelik
Cambridge U. P., New York, 1995. 332 pp. $74.95 hc
ISBN 0-521-45467-0

Quantum field theories have long been used in condensed matter physics to describe the quantum physics of many electrons interacting with each other, with phonons and with random disorder potentials. These applications of quantum field theory underpin much of our modern understanding of the electronic properties of solids and are ably summarized in the influential and well-known texts by Alexi Abrikosov, Lev Gorkov and Igor Dzyaloshinsky, Alexander L. Fetter and John Dirk Walecka, and Jerry Mahan, among others.

Recent years have seen an explosion of more "crafty" applications of quantum field theory. These circumvent the insurmountable difficulties that often frustrate a direct approach by starting from partially phenomenological, low-energy effective field theoretical models. The phenomenological approach has an important historical root in the spin models used for the low-energy properties of magnetic insulators. The power of this approach is evidenced by recent advances in our understanding of, in particular, low-dimensional electron and spin systems.

The increasingly nimble use of diverse field theories in describing condensed matter physics systems has generated a need for monographs that provide a more expansive view of quantum field theory than do traditional condensed matter "many-body theory" texts. Several books have appeared recently in response, including Assa Auerbach's *Interacting Electrons and Quantum Magnetism* (Springer-Verlag, 1994), Eduardo Fradkin's *Field Theories of Condensed Matter Systems* (Addison-Wesley, 1991) and most recently Alexi Tsvelik's *Quantum Field Theory in Condensed Matter Physics*. All these books present nonperturbative approaches to interacting electron systems, approaches that are motivated in part by theoretical efforts to understand high-temperature superconductivity. All of these books develop formulations of interacting spin models, a topic not addressed at all in most traditional texts, and they contain extensive discussions of the physics of low-dimensional quantum antiferromagnets. Together they provide a valuable resource for students and active researchers in condensed matter theory.

Tsvelik has attempted to produce a book that is somewhat more comprehensive than its immediate antecedents. The book starts with a discussion of the path integral formulation of quantum field theory for bosons and fermions. This section includes brief general presentations of diagrammatic perturbation theory for bosons and fermions, as well as an extensive discussion of violations of the Landau Fermi liquid theory in metals due to the exchange of transverse photons between electrons. This is followed by an introduction to various field theoretical formulations of interacting spin models. In applications, the emphasis in this section is on the physics of spin-liquid systems. For me, the book succeeds most impressively in its final section, which addresses the physics of (1 + 1)-dimensional quantum models and the corresponding two-dimensional classical statistical mechanics models. Emphasis here is placed on explaining the use of conformal symmetry in many of these models.

Tsvelik's stated objective for this book is to familiarize condensed matter physics students, and researchers who have not been active in this area, with recent achievements in quantum field theory. By this measure, his exposition is admirably successful. The treatment of the more traditional condensed matter many-body perturbation theory is not, by either the author's estimation or my own, sufficiently thorough for this book to serve as a stand-alone replacement for the classic texts.

The presentation of conformal symmetry applications is equally terse but will, I believe, serve well for readers seeking a quick and casual introduction. I suspect that the book will, as intended, find its greatest value in bridging the gap between courses based on one or another of the standard texts and the current research literature on low-dimensional electron and spin model systems. The author's breezy writing style brightens the text, and his amusing sketches of some active researchers provide occasional welcome diversion.

I expect my copy to become one of the more ratty items on my bookshelf.

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Molecular Physics and Elements of Quantum Chemistry: Introduction to Experiments and Theory

Hermann Haken
and Hans Christoph Wolf
Translated by William D. Brewer
Springer-Verlag, New York, 1995. 406 pp. $49.50 hc
ISBN 0-387-58363-7

Molecular Physics and Elements of Quantum Chemistry is a graduate or advanced undergraduate textbook written by two prominent German molecular physicists: Hermann Haken is a theorist who works broadly in radiation and relaxation; Hans Christoph Wolf is a spectroscopist with wide interests in organic molecules and solids. Since molecular science becomes physical chemistry or chemical physics in the US, their physics perspective re-