China in 1978. Fang was appointed as my guide. He and I gave lectures all over the country on the new results on black holes, gravitational waves, and cosmology—in universities that still showed scars from the Cultural Revolution.

I also recalled how Zhou Peiyuan, president of Peking University, had arranged on behalf of the academy to hold the 3rd Marcel Grossmann Meeting (1982) in Shanghai. It was the country's first truly international meeting, thanks in part to Zhou's facilitating the admission of Israeli scientists into China. The Confucius-inspired saying, expressed as "friends from all over the world are welcome," acquired a more modern version, "scientists from all over the world are welcome."

All those events helped to promote China's momentous transition from a closed country, constrained by a dogmatic application of Marxist rules and lacking the methodology to approach real social necessities and scientific knowledge, to the China of today, characterized by its tremendous support for science, the pursuit of knowledge, and technological development admired all around the world.

I don't know if Fang would have liked the title of this book. In an interview of him by our common friend Tiziano Terzani, Fang was asked, "Your name was put at the top of the 'most wanted' list in China. You might not like to be called 'conspirator,' but would you accept the term 'inspirator'?" Fang's reply: "Yes. This is a label I have to accept."

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Statistical Mechanics and Applications in Condensed Matter

Carlo Di Castro and Roberto Raimondi
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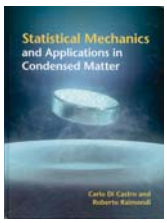

Science educators and students alike have long struggled to answer the question, "What textbooks will help me learn that?" In condensed-matter theory, the problem is aggravated by the fast and turbulent growth of new, exotic subjects, whose substance, meaning, and connection to the standard theories enshrined in venerable texts are often unclear to the unsavvy.

Carlo Di Castro and Roberto Raimondi's *Statistical Mechanics and Applications in Condensed Matter* answers the question and effectively fills a good part of the theory gap in conventional texts for the lively area of research that involves condensed-matter physics, many-body theory, and quantum statistical mechanics. The authors, whose competence is beyond doubt, employ a well-considered approach to bridge background statistical mechanics topics, standard condensed-matter physics applications, and a limited but inspiring choice of advanced and timely many-body themes.

The first seven chapters offer a self-contained presentation of introductory statistical mechanics, both classical and quantum, starting from basic thermodynamics. In subsequent chapters, readers with a particular interest in phase transitions and equilibrium critical phenomena can learn about such approaches as mean-field theory, Landau theory, scaling, and the renormalization group. The authors deliver a well-designed exposition of quantum many-body phenomena before moving on to explanations of superconductivity, superfluidity, and the general properties of Fermi liquids. That exposition prepares the reader for the ensuing discussion of such advanced topics as the microscopic foundations of Fermi liquids, the Tomonaga–Luttinger model for one-dimensional systems, Anderson localization, and weak-localization phenomena. Compact yet effective presentations of thermal Green's function diagrams and Feynman diagrams—traditional tools of the many-body theorist—are applied to modern and advanced aspects of condensed-matter theory, in particular, to interactions in disordered fermionic systems.

The authors acknowledge making a deliberate choice not to include everything that is new, or hot, or even important, such as the quantum Hall effect, or some of the wonders of Mott physics, noise physics, and topological insulators. Indeed, those subjects are already well covered in recent books and reviews. However, Di Castro and Raimondi do present some recent developments that are rarely found in course texts. For instance, their treatment of the fluctuation-

dissipation theorem goes well beyond explaining the Crooks relationship and the Jarzynski inequality. Another example is their discussion of the diagrammatic aspects of the Tomonaga–Luttinger model and Ward identities.

Whatever subjects the authors include, they cover in depth. They avoid the temptation to simply announce results in words or to show results and equations without including the mathematical proof. Instead, they provide an abundance of proofs to go along with appropriate verbal explanations. They take great care to relate detailed results to the fundamentals and even include historical facts that are rarely covered in technical books and articles.

The book's end-of-chapter problems deserve special mention. They are relatively few in number, but are well designed; some of them are quite demanding and could be considered as small projects. Such problems are a rare gift: Students that engage with the exercises, whose solutions can be found in an appendix, will greatly benefit in their understanding. Lecturers will benefit, too: The poor souls are often at a loss on where to find good problems.

In sum, *Statistical Mechanics and Applications in Condensed Matter* is a well-designed, user-friendly text that represents an impressive and successful effort to synthesize modern aspects of condensed-matter and many-body phenomena. I have no doubt that this book will soon be found—and deservedly so—in physics libraries and on the bookshelves of many students and researchers.

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The Quantum Dissidents

Rebuilding the Foundations of Quantum Mechanics (1950–1990)

Olival Freire Jr
Springer, 2015. $99.00 (356 pp.).
ISBN 978-3-662-44661-4

In September 1967 experimentalist Otto Frisch wrote a letter to his cousin Hugo Tausk, the father of a young physicist named Klaus Tausk. A year earlier Klaus had distributed a preprint of a paper critical of the orthodox, so-called Copenhagen interpretation of quantum mechanics and had ignited a fierce controversy. Frisch made clear in his letter that much more than physics was at stake. The orthodox view, he noted, states that physics is concerned with measurements rather than with objects: "That tastes like idealism, and is therefore rejected by the communists. Vice versa also applies, since anyone here in the West who doubts the orthodox interpretation—even for objective reasons—is suspect[ed] of communism."

Of course, that binary did not properly hold, Frisch continued, for the debate possessed "the complexities and meaninglessness of a religious war, complete with converts: the greatest defender of the orthodoxy is a communist [Léon Rosenfeld], and many in the opposition are fully bourgeoise." Despite support from some, the younger Tausk suffered for his apostasy. His adviser refused to attend his thesis defense, and the examiners who did attend almost failed him. His career sputtered in the aftermath of the controversy he had almost inadvertently entered into.

The Tausk controversy and others that concern the foundations of quantum mechanics are the subject of Olival Freire Jr's exceptionally well-researched book, *The Quantum Dissidents: Rebuilding the Foundations of Quantum Mechanics (1950–1990)*. Freire is one of the world's leading historians of post–World War II quantum theory. The tale he tells is a fascinating one. In the 1950s the question of the appropriate epistemological and ontological foundations of quantum mechanics was considered settled. That is why Rosenfeld objected to Werner Heisenberg's introduction around 1955 of the term "Copenhagen interpretation"—it implied the existence of some alternative interpretation. In the 1980s—a time that featured experiments involving tests of Bell's inequalities—foundational questions were among the most exciting in contemporary physics. The question the book asks is thus straightforward but very important: How did a subject move from the periphery of physics—worthy of contemplation by philosophers, perhaps,