state of the art. The danger is that the book is intended for advanced undergraduates who, two or three years later, will be pursuing graduate research where state-of-the-art methods are essential to their research progress. The book lacks warnings such as, for example, that fixed-step-size integration methods for ordinary differential equations are likely to fail when applied to realistic problems and a realistic computer budget.

Cavils aside, the core of the book is full of such nice physics ideas (along with good exercises) that it bears reading by anyone who teaches physics to undergraduates. The book's weakness can be understood in the context of its being, in spirit, a rough-and-ready laboratory manual for a numerical-laboratory course. That course looks like such fun to teach that many of us will, as the result of this book, soon be knocking on the doors of our department chairs, with new course proposals in hand.

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Fundamentals of Superconductivity

Vladimir Z. Kresin and Stuart A. Wolf
Plenum, New York, 1990. 231 pp. $42.50 hc
ISBN 0-306-43474

High-temperature superconductivity has dominated solid-state physics during the last four to five years. Hence it is not surprising to find many books on the subject. Even conference proceedings are published with a fanfare. A few edited books—such as *Physical Properites of High Temperature Superconductors* by D. M. Ginsberg (World Scientific, Teaneck, N. J., 1989) and *High Temperature Superconductivity* by J. W. Lynn (Springer-Verlag, New York, 1990)—and a single author book—*The Physics of High-T_c Superconductors* by J. C. Phillips (Academic, San Diego, Calif., 1989, reviewed in PHYSICS TODAY, November 1990, page 82)—are of some use to the beginner. Thus a book on superconductivity that is written for "a very broad audience, including students, engineers, teachers, scientists, and others who are interested in learning about this exciting frontier of science" is worthy of some interest.

This book covers conventional, not high-T_c, superconductors although the last chapter (about 15 pages long) is devoted to the cuprate superconductors. The presentation, which has a qualitative nature, has an expected order: BCS theory, BCS predictions, the Josephson effect and Ginzburg–Landau theory. There are interesting discussions of strong-coupled BCS and non-phonon mechanisms, which are unusual in an introductory book. Then follows a few chapters that include applications and discussion of an interesting if somewhat random collection of topics (organic superconductors, the bronze process, J_c measurements, ^{3}He and many more).

I cannot recommend this book for the audience suggested by the authors. Essentially every part of the book contains confusing statements, incorrect equations, inadequate diagrams and bewildering figure captions. One of the Ginzburg–Landau equations contains four errors, yet it is written correctly only four pages before. The superconductor $NbC_{0.1}N_{0.9}$ is written as such in one sentence and then as NbCN in the very next sentence; and the diagram of its structure (which should be the NaCl structure) is completely incorrect. These are random examples: The book has a huge number of similarly confusing sentences and paragraphs.

I had looked forward to the chapter on high-T_c superconductors, but here too the confusion continues. For example, a picture of $LaCuO_3$ with the perovskite structure is shown and described as the superconductor discovered by J. Georg Bednorz and K. Alex Müller. A second figure corrects the first figure (I guess) except that the lanthanum atoms and some of the oxygen atoms look identical. The other structure diagrams are of no use and the rest of the chapter does little to help the reader.

Only those with a knowledge of superconductivity can exercise caution and "read past" the confusing or incorrect parts. I might suggest this book to such scientists, as they could enjoy the range of topics that are covered.

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Introduction to Polymer Dynamics

Pierre Gilles de Gennes
Cambridge U. P., New York, 1990. 57 pp. $34.00 hc
ISBN 0-521-38172-X

Polymer physics developed quite a bit later than did solid-state physics, and quite naturally much of the foundation was laid down by chemists from the 1930s through the 1950s. Then during the 1960s, while many physicists were occupied solving myriad

"solid" problems, two highly original theoretical physicists, Sam Edwards and Pierre Gilles de Gennes, became seduced by "the goop." Both had made major contributions to solid-state physics and started considering other problems outside of what was then the mainstream. Thus they began a further development in polymers that gave it quite a different flavor and, combined with newly available experimental data, allowed for a much deeper understanding of the subject.

De Gennes has had an enormous impact on polymer physics and has contributed to the understanding of virtually every aspect of it. His first book on polymers, *Scaling Concepts in Polymer Physics* (Cornell U. P., Ithaca, N. Y., 1979), is a very elegant introduction to the subject, covering basic material such as equilibrium and dynamical properties of polymers. It is written to be accessible to experimentalists, combining physical intuition and mathematical simplicity. It had a large impact on the polymer community as it helped bridge the gap between the old and the new approach to polymers.

His latest book, *Introduction to Polymer Dynamics*, is quite short—57 pages—and is based on lectures he gave at the Politecnico di Milano in 1986. It consists of four chapters: The first is a basic introduction to the equilibrium properties and dynamics of polymer chains, and the last three explore intriguing problems of current interest, set forth in de Gennes's elegant and original style. The three latter chapters each cover very different problems: protein structure, spreading of liquids and turbulent drag reduction by polymers. All three topics are areas of much ongoing research to which de Gennes has made important contributions. The chapter on protein structure gives a statistical estimate for the minimum number of amino acids in loops between receptor sites of a globular protein. This work, originally performed some 15 years ago and mentioned at a biology conference, appears for the first time in this book.

The book is succinct and clear, but it does not try to provide a comprehensive treatment of polymer dynamics. I highly recommend it to researchers at the graduate level and above who wish to acquaint themselves with current research topics in polymer physics. It is written so as to be intelligible to experimentalists, and, because of its brevity, de Gennes often summarizes the main physical conclusions. *Introduction to Polymer Dynamics* provides valuable insights into a number of fascinating problems in this fertile field.

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Tuva or Bust! Richard Feynman's Last Journey

Ralph Leighton
Norton, New York, 1991.
256 pp. $19.95 hc
ISBN 0-393-02953-0

Reviewed by Freeman Dyson

This is an account of the eleven-year campaign, waged by Richard Feynman and his friend Ralph Leighton, to visit the country known to stamp collectors as Tannu-Tuva and to the Soviet government as the Tuva Autonomous Soviet Socialist Republic. The campaign began in 1977 with a casual conversation between Feynman and Leighton in which they resolved to go to Tuva and ended with Feynman's death in 1988.

The initial impulse came from Feynman's memory of the beautiful stamps issued by Tannu-Tuva in 1936 to commemorate the 15th anniversary of its existence as an independent country. Feynman decided that Tuva was the most obscure and inaccessible place on Earth and therefore the most suitable spot for an adventurous spirit to visit. As an additional motivation for his efforts, he had a strong dislike for the repressive policies of the Soviet government and hoped, by visiting Tuva, to throw some light into a dark corner of Soviet territory. In 1988, after the Gorbachev revolution, with *glasnost* in the ascendant in Moscow, a letter finally arrived in Pasadena inviting Feynman and his wife to visit Tuva as guests of the Soviet Academy of Sciences. The letter came two weeks after Feynman's death.

The story told in this book is not a story of failure. Although Feynman failed to reach Tuva, his indefatigable efforts resulted in effects much larger than he had intended. One of these effects was a magnificent traveling exhibition of artifacts from Central Asia called "Nomads of Eurasia," which arrived in Los Angeles in 1987. In conjunction with the exhibition, an international symposium of ethnographers and archaeologists was held at the University of Southern California with Feynman serving as honorary chairman. Feynman said to the assembled scholars, "You can understand how it's a great delight for me to welcome you all here, to see a kind of reality resulting from the nonsense with which we began. We just wanted to visit what was to us the most