Journal of Statistical Physics, Vol. 27, No. 4, 1982

Book Review: *Techniques and Applications of Path Integration*

Techniques and Applications of Path Integration. *Lawrence S. Schulman.* Wiley-Interscience, New York, 1981, 359 pages, $31.95.

The outstanding properties of this book are lively, clear exposition, and discussion of a wide range of applications of path integration. The applications include the standard ones of the perturbation expansion in nonrelativistic quantum mechanics, the WKB approximation, and the polaron (one of the early successes of the path integral method). Unusual applications include the discussion of spin, path integrals for multiply connected spaces, black holes, and critical droplets. Where needed, brief discussions of mathematical topics, such as the Morse index theorem and homotopy theory, which might not be familiar to the audience of physicists and applied mathematicians to which the book is addressed, are inserted. Quantum field theory is treated only in a cursory way.

Schulman's book is written in a more informal and less homogeneous style than two other recent books on path integration. The other recent books are *Functional Integration and Quantum Physics*, by Barry Simon, which centers around a rigorous derivation of results in quantum mechanics, and *Quantum Physics, A Functional Integral Point of View*, by James Glimm and Arthur Jaffe, which is mainly concerned with statistical mechanics and quantum field theory.

The book by Schulman can be recommended as an accessible treatment of path integration with a wide range of applications.

O. W. Greenberg
Department of Physics and Astronomy
University of Maryland
College Park, Maryland

0022-4715/82/0400-0827$03.00/0