

Theory of Fluctuations in Superconductors (International Series of Monographs on Physics)

By Anatoly Larkin, Andrei Varlamov

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This book presents a complete encyclopaedia of superconducting fluctuations, summarising the last thirty-five years of work in the field. The first part of the book is devoted to an extended discussion of the Ginzburg-Landau phenomenology of fluctuations in its thermodynamical and time-dependent versions and its various applications. The second part deals with microscopic justification of the Ginzburg-Landau approach and presents the diagrammatic theory of fluctuations. The third part is devoted to a less-detailed review of the manifestation of fluctuations in observables: diamagnetism, magnetoconductivity, various tunneling characteristics, thermoelectricity, and N.M.R. relaxation. The final chapters turn to the manifestation of fluctuations in unconventional superconducting systems: nanodrops, nanorings, Berezinsky-Kosterlitz-Thouless state, quantum phase transition between superconductor and insulator, and thermal and quantum fluctuations in weak superconducting systems. The book ends with a brief discussion on theories of high temperature superconductivity, where fluctuations appear as the possible protagonist of this exciting phenomenon.

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Review
"Theory of Fluctuations in Superconductors is a thorough and timely book aimed at both theorists and experimentalists interested in current topics in superconductivity. The book will be a useful guide and reference for graduate students and established workers in the field."

--James F. Annett, Physics Today

About the Author
The late Anatoly Larkin was William I. Fine and Bianca Chair in Theoretical Physics at the University of Minnesota, U.S.A. as well as a principal researcher at the Landau Institute for Theoretical Physics in Russia. Andrei Varlamov is a principal researcher at Coherentia-I.N.F.M. in Rome, Italy.

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