

**Recent Progress in
MANY-BODY
THEORIES**

VOLUME **1**

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Recent Progress in **MANY-BODY THEORIES**

VOLUME **1**

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PREFACE

The present volume contains the texts of the invited talks delivered at the Fifth International Conference on Recent Progress in Many-Body Theories held in Oulu, Finland during the period 3-8 August 1987. The general format and style of the meeting followed closely those which had evolved from the earlier conferences in the series: Trieste 1978, Oaxtepec 1981, Altenberg 1983 and San Francisco 1985. Thus, the conferences in this series are intended, as far as is practicable, to cover in a broad and balanced fashion both the entire spectrum of theoretical tools developed to tackle the quantum many-body problem, and their major fields of application. One of the major aims of the series is to foster the exchange of ideas and techniques among physicists working in such diverse areas of application of many-body theories as nucleon-nucleon interactions, nuclear physics, astronomy, atomic and molecular physics, quantum chemistry, quantum fluids and plasmas, and solid-state and condensed matter physics. A special feature of the present meeting however was that particular attention was paid in the programme to such topics of current interest in solid-state physics as high-temperature superconductors, heavy fermions, the quantum Hall effect, and disorder. A panel discussion was also organised during the conference, under the chairmanship of N.W. Ashcroft, to consider the latest developments in the extremely rapidly growing field of high- T_c superconductors.

In order to facilitate the usefulness of this book, related articles have been grouped by the Editors under a number of headings chosen by them, and hence the articles do not follow the same sequence as their oral presentations. We are keenly aware however that both the classification scheme and the groupings of the articles within it that we have adopted, are somewhat arbitrary. The interested reader therefore should not follow the scheme too slavishly. A notable feature of the conference was the very high standard of the contributed papers, all of which were presented at poster sessions. None of these is included in the present volume, although they undoubtedly contributed greatly to the success of the meeting.

Two special events during the present conference are also recorded in articles included at the end of this volume. The first of these was intended to mark the 65th birthday of Hermann G. Kümmer and his impending retirement from the Chair in Theoretical Nuclear Physics at Ruhr-Universität Bochum. A presentation was made to him at the Conference at the end of a special talk by J.G. Zabolitzky included herein. Secondly, the winner of the second Eugene Feenberg Memorial Medal in Many-Body Physics was announced during the meeting to be John W. Clark of Washington University, St. Louis. The corresponding tribute to him prepared by the Chairman of the Selection Committee for the second award, appears at the end of this volume. The first Feenberg prizewinner, David Pines of the University of Illinois at Urbana-Champaign, also received his medal during the same session at the present conference, although his award had been announced at the previous meeting in San Francisco in 1985.

By now, the series of International Conferences on Recent Progress in Many-Body Theories has a relatively long and well-established history, and its continuation in essentially the present format is assured. As a consequence, more secure and long-term arrangements were made at the present meeting in respect of the organisation, responsibilities and membership of the International Advisory Committee. In the same spirit, it was also decided that the proceedings of this and future conferences should henceforth be published by Plenum Publishing Corporation in the uniform format now established by this first volume. Oversight responsibility for the series has been vested in a Series Editorial Board, the members of which will also act as officers of the Conference Trust Fund. It is our sincere hope that this newly-established Series will provide a valuable resource for all those interested in many-body physics, and will act as a useful vehicle for the wide and speedy dissemination of recent developments in this increasingly important field.

The organisers wish to record their thanks to all those who helped with the programme. Particular thanks in this regard go to J.W. Clark, B. Halperin and J. Hertz. Many thanks also go to our sponsors: The Research Institute for Theoretical Physics in Helsinki, NORDITA, the Ministry of Education of Finland, Finnish Cultural Foundation, University of Oulu and the City of Oulu. Finally we acknowledge with thanks the assistance of Mrs. Maila Volanen who acted as the conference secretary, and the many personnel and students of the Department of Theoretical Physics of the University of Oulu.

Oulu, Finland

Alpo J. Kallio
Erkki Pajanne
Raymond F. Bishop

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