

Nuclear Superfluidity

Pairing in Finite Systems

Nuclear Superfluidity is the first modern text devoted exclusively to pair-correlations in nuclei. It begins by exploring pair-correlations in a variety of systems including superconductivity in metals at low temperatures and superfluidity in liquid ^3He and in neutron stars. The book goes on to introduce basic theoretical methods, symmetry breaking and symmetry restoration in finite many-body systems. The last four chapters are devoted to introducing new results on the role of polarization effects in the structure of both normal and exotic nuclei. Central to this discussion is the fact that while bare nucleon–nucleon interactions are essential for the production of pair-correlations in nuclei, the coupling of pairs of nucleons to low-energy nuclear collective excitations also plays an important role.

This book will be essential reading for researchers and students in both experimental and theoretical nuclear physics, and related research fields such as metal clusters, fullerenes and quantum dots. This title, first published in 2005, has been reissued as an Open Access publication on Cambridge Core.

DAVID M. BRINK obtained his first degree at the University of Tasmania in 1951 and his D.Phil. at Oxford University in 1955. Between 1958 and 1993 he held academic positions in the University of Oxford, including a Fellowship at Balliol College and the Moseley Readership in Theoretical Physics, and taught many branches of physics at graduate and undergraduate level. From 1993 to 1998 he was Professor of the History of Physics at the University of Trento in Italy. Professor Brink is a Fellow of the Royal Society and in 1982 was a recipient of the Rutherford Medal of the Institute of Physics. He has published several books including *Semi-classical Methods in Nucleus–Nucleus Scattering* (Cambridge University Press, 1985).

RICARDO A. BROGLIA earned his Ph.D. at the University of Cuyo, Argentina, in 1965. Following positions at the University of Buenos Aires, the Niels Bohr Institute and the University of Minnesota, he joined the staff of the Niels Bohr Institute in 1970, where he is now adjunct Professor. He has held visiting positions at the State University of New York at Stony Brook, Brookhaven National Laboratory, Los Alamos Scientific Laboratory and Oak Ridge National Laboratory. In 1985 he was called to occupy the chair of Nuclear Structure at the University of Milan. Professor Broglia's research interests include nuclear structure and nuclear reactions, the physics of metal clusters and fullerenes, and the folding and aggregation of proteins. He has published several books on these subjects including *Finite Quantum Systems* jointly with George Bertsch (Cambridge University Press, 1994).

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Cambridge University Press is part of Cambridge University Press & Assessment,
a department of the University of Cambridge.

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education, learning and research at the highest international levels of excellence.

www.cambridge.org
Information on this title: www.cambridge.org/9781009401876

DOI: 10.1017/9781009401920

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When citing this work, please include a reference to the DOI 10.1017/9781009401920

First published 2005
First paperback printing 2010
Reissued as OA 2023

A catalogue record for this publication is available from the British Library.

ISBN 978-1-009-40187-6 Hardback
ISBN 978-1-009-40190-6 Paperback

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