



universe



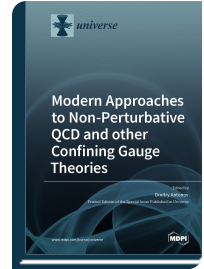
Special Issue Reprint

Modern Approaches to Non-Perturbative QCD and other Confining Gauge Theories

www.mdpi.com/books/reprint/5183

Edited by
Dmitry Antonov

ISBN 978-3-0365-3329-2 (Hardback)
ISBN 978-3-0365-3330-8 (PDF)



This book contains seven reviews and four research articles on the various modern approaches to the problem of quark confinement in quantum chromodynamics (QCD). These approaches include microscopic models of the Yang–Mills vacuum, which are based on the condensation of magnetic monopoles and center vortices, as well as the models of the confining quark–antiquark string. Possible applications of these models to the analysis of the novel superinsulating state, which emerges in such condensed-matter systems as Josephson junction arrays, are further discussed in one of the reviews. Two reviews from this collection discuss the approaches towards the analytic construction of effective confining theories, at the classical level and within the center-vortex model of the Yang–Mills vacuum. Other aspects of non-perturbative physics addressed by this collection include a possible connection between the localization of low-lying Dirac eigenmodes with the deconfinement and the chiral QCD phase transitions, as well as the role of topology in baryon-rich matter. Last but not least, a novel model of dark matter, based on ultralight axion particles, whose masses are arising due to distinct $SU(2)$ Yang–Mills scales and the Planck mass, is suggested and developed in one of the contributed articles.



Order Your Print Copy
You can order print copies at
www.mdpi.com/books/reprint/5183

MDPI Books offers quality open access book publishing to promote the exchange of ideas and knowledge in a globalized world. MDPI Books encompasses all the benefits of open access – high availability and visibility, as well as wide and rapid dissemination. With MDPI Books, you can complement the digital version of your work with a high quality printed counterpart.



Open Access

Your scholarly work is accessible worldwide without any restrictions. All authors retain the copyright for their work distributed under the terms of the Creative Commons Attribution License.



Author Focus

Authors and editors profit from MDPI's over two decades of experience in open access publishing, our customized personal support throughout the entire publication process, and competitive processing charges as well as unique contributor discounts on book purchases.



High Quality & Rapid Publication

MDPI ensures a thorough review for all published items and provides a fast publication procedure. State-of-the-art research and time-sensitive topics are released with a minimum amount of delay.



High Visibility

Due to our global network and well-known channel partners, we ensure maximum visibility and broad dissemination. Title information of books is sent to international indexing databases and archives, such as the Directory of Open Access Books (DOAB), and the Verzeichnis Lieferbarer Bücher (VLB).



Print on Demand and Multiple Formats

MDPI Books are available for purchase and to read online at any time. Our print-on-demand service offers a sustainable, cost-effective and fast way to publish MDPI Books printed versions.