KINKS AND DOMAIN WALLS

An Introduction to Classical and Quantum Solitons

Kinks and domain walls are the simplest kind of solitons and hence they are invaluable for testing various ideas and for learning about non-perturbative aspects of field theories. They are the subject of research in essentially every branch of physics, ranging from condensed matter to cosmology.

This book is a pedagogical introduction to kinks and domain walls and their principal classical and quantum properties. The book starts out by discussing classical solitons, building up from examples in elementary systems to more complicated settings. The quantum properties are introduced, together with discussion of the very fundamental role that solitons may play in particle physics. The formation of solitons in phase transitions, their dynamics, and their cosmological consequences are further discussed. The book closes with an explicit description of a few laboratory systems containing solitons.

Kinks and Domain Walls includes several state-of-the-art results (some previously unpublished), providing a handy reference. Each chapter closes with a list of open questions and research problems. This book will be of great interest to both graduate students and academic researchers in theoretical physics, particle physics and condensed matter physics. This title, first published in 2007, has been reissued as an Open Access publication on Cambridge Core.

TANMAY VACHASPATI is a professor in the Physics Department at Case Western Reserve University. He was the Rosenbaum Fellow for the Topological Defects Programme at the Isaac Newton Institute, and is a Fellow of the American Physical Society. Professor Vachaspati co-edited *The Formation and Evolution of Cosmic Strings* with Professors Gary Gibbons and Stephen Hawking.

Published online by Cambridge University Press

Published online by Cambridge University Press

KINKS AND DOMAIN WALLS

An Introduction to Classical and Quantum Solitons

TANMAY VACHASPATI
Case Western Reserve University

CAMBRIDGE
UNIVERSITY PRESS

Published online by Cambridge University Press



Shaftesbury Road, Cambridge CB2 8EA, United Kingdom

One Liberty Plaza, 20th Floor, New York, NY 10006, USA

477 Williamstown Road, Port Melbourne, VIC 3207, Australia

314–321, 3rd Floor, Plot 3, Splendor Forum, Jasola District Centre, New Delhi – 110025, India

103 Penang Road, #05–06/07, Visioncrest Commercial, Singapore 238467

We share the University's mission to contribute to society through the pursuit of a department of the University of Cambridge.

We share the University's mission to contribute to society through the pursuit of education, learning and research at the highest international levels of excellence.

www.cambridge.org
Information on this title: www.cambridge.org/9781009290418

DOI: 10.1017/9781009290456

© Tanmay Vachaspati 2022

This work is in copyright. It is subject to statutory exceptions and to the provisions of relevant licensing agreements; with the exception of the Creative Commons version the link for which is provided below, no reproduction of any part of this work may take place without the written permission of Cambridge University Press.

An online version of this work is published at doi.org/10.1017/9781009290456 under a Creative Commons Open Access license CC-BY-NC-ND 4.0 which permits re-use, distribution and reproduction in any medium for non-commercial purposes providing appropriate credit to the original work is given. You may not distribute derivative works without permission. To view a copy of this license, visit https://creativecommons.org/licenses/by-nc-nd/4.0

All versions of this work may contain content reproduced under license from third parties. Permission to reproduce this third-party content must be obtained from these third-parties directly.

When citing this work, please include a reference to the DOI 10.1017/9781009290456

First published 2007
Reissued as OA 2022

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

ISBN 978-1-009-29041-8 Hardback
ISBN 978-1-009-29042-5 Paperback

Cambridge University Press & Assessment has no responsibility for the persistence or accuracy of URLs for external or third-party internet websites referred to in this publication and does not guarantee that any content on such websites is, or will remain, accurate or appropriate.

Published online by Cambridge University Press