



# The Defocusing Nonlinear Schrodinger Equation: From Dark Solitons to Vortices and Vortex Rings

By P. G. Kevrekidis, D. J. Frantzeskakis, Ricardo Carretero-Gonzalez

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Bose-Einstein condensation is a phase transition in which a fraction of particles of a boson gas condenses into the same quantum state known as the Bose-Einstein condensate (BEC). The aim of this book is to present a wide array of findings in the realm of BECs and on the nonlinear Schrödinger-type models that arise therein.

*The Defocusing Nonlinear Schrödinger Equation* is a broad study of nonlinear excitations in self-defocusing nonlinear media. It summarizes state-of-the-art knowledge on the defocusing nonlinear Schrödinger-type models in a single volume and contains a wealth of resources, including over 800 references to relevant articles and monographs and a meticulous index for ease of navigation.

**Audience:** This book is intended for atomic and condensed-matter physicists, nonlinear scientists, and applied mathematicians. It will be equally valuable to beginners and experienced researchers in these fields.

**Contents:** Preface; Acknowledgments; Chapter 1: Introduction; Chapter 2: The One-Dimensional Case; Chapter 3: The Two-Dimensional Case; Chapter 4: The Three-Dimensional Case; Bibliography; Index.

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## **Editorial Review**

### **About the Author**

**P. G. Kevrekidis** is a Professor at University of Massachusetts, Amherst. He has authored over 450 publications and co-authored/edited five books. He is a Fellow of the APS and a Stanislaw M. Ulam Fellow at the Los Alamos National Laboratory, and he is a recipient of a Humboldt Fellowship, an NSF-CAREER award, the J.D. Crawford Prize in Dynamical Systems, and the Stephanos Pnevmatikos Prize for Research in Nonlinear Phenomena, among others.

**D. J. Frantzeskakis** is a Professor in the Department of Physics at the University of Athens, Greece. His research interests include nonlinear waves and solitons, with applications in various physical contexts. He has supervised seven Ph.D. theses, has co-organized several international symposia, and was a guest editor of two international journals. He has authored or co-authored more than 200 peer-reviewed publications, including four invited review papers, and he has co-edited four books.

**R. Carretero-González** is a Professor of Applied Mathematics at San Diego State University (SDSU). His research focuses on spatio-temporal dynamical systems, nonlinear waves, and their applications. He is the co-founder and co-director of the Nonlinear Dynamical Systems (NLDS) group at SDSU. He has received multiple NSF grants and has published more than 100 peer-reviewed manuscripts, including three co-authored/edited books. He is an active advocate of the dissemination of science, continuously delivers engaging presentations at local high schools and science festivals, and helps design museum exhibits.

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