Special Issue

Ultracold Atoms and Quantum Gases

Message from the Guest Editors

Over the past 25 years, ultra-cold atoms and quantum fluids have become an area of extremely active research interest. Following several Nobel prizes awarded to researchers associated with this field, the exquisite control over experimental parameters in ultracold atoms has spawned a huge field ranging from precision measurement to quantum simulation. For instance, it has become possible to image and manipulate single atoms in a quantum gas microscope. Self-bound droplets of interacting dipolar quantum fluids have been observed and understood. Many other phenomena that only existed in the minds of visionaries have been observed using these techniques.
In parallel, our theoretical understanding of how quantum systems behave has made huge strides forward. At times, a surprising result of an experiment spawned new insight, and a theoretical framework was developed to match. At other times, a new theoretical concept spawned experiments showing exactly that. It is this interplay between theory and experiment that makes the field of ultracold atoms and quantum gases one of the most exciting. In this Special Issue we aim to illuminate a number of frontiers of our research field.

Guest Editors

Dr. Maarten Hoogerland

Department of Physics, University of Auckland, Private Bag, Auckland 92019, New Zealand

Dr. Mark Baker

School of Mathematics and Physics, University of Queensland, Brisbane, QLD 4072, Australia

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Symmetry
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
symmetry@mdpi.com

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Message from the Editor-in-Chief

Symmetry is ultimately the most important concept in natural sciences. It is not surprising then that very basic and fundamental research achievements are related to symmetry. For instance, the Nobel Prize in Physics 1979 (Glashow, Salam, Weinberg) was received for a unified symmetry description of electromagnetic and weak interactions, while the Nobel Prize in Physics 2008 (Nambu, Kobayashi, Maskawa) was received for the discovery of the mechanism of spontaneous breaking of symmetry, including CP symmetry. Our journal is named *Symmetry* and it manifests its fundamental role in nature.

Editor-in-Chief

Prof. Dr. Sergei Odintsov
1. ICREA, 08010 Barcelona, Spain
2. Institute of Space Sciences (IEEC-CSIC), C. Can Magrans s/n, 08193 Barcelona, Spain

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