

Graduate Texts in Physics

Dirk Dubbers · Hans-Jürgen Stöckmann

## Quantum Physics: The Bottom-Up Approach

From the Simple Two-Level System to Irreducible Representations

This concise tutorial provides the bachelor student and the practitioner with a short text on quantum physics that allows them to understand a wealth of quantum phenomena based on a compact, well readable, yet still concise and accurate description of nonrelativistic quantum theory. This “quadrature of the circle” is achieved by concentrating first on the simplest quantum system that still displays all basic features of quantum theory, namely, a system with only two quantized energy levels. For most readers it is very helpful to understand such simple systems before slowly proceeding to more demanding topics like particle entanglement, quantum chaos, or the use of irreducible tensors. This tutorial does not intend to replace the standard textbooks on quantum mechanics, but will help the average student to understand them, often for the first time.

Physics

ISBN 978-3-642-31059-1



9 783642 310591

► [springer.com](http://springer.com)



Graduate Texts in Physics

ADVERTISEMENT

Dirk Dubbers  
Hans-Jürgen Stöckmann

# Quantum Physics: The Bottom-Up Approach

From the Simple Two-Level System  
to Irreducible Representations

 Springer

Dirk Dubbers, Hans-Jürgen Stöckmann

## **Quantum Physics: The Bottom-Up Approach**

From the Simple Two-Level System to Irreducible Representations

266 pages, 60 figures

© Springer-Verlag Berlin Heidelberg 2013

[doi:10.1007/978-3-642-31060-7](https://doi.org/10.1007/978-3-642-31060-7)

I PROLOGUE	p.1
II TWO-STATE QUANTUM SYSTEMS	p.11
III QUANTUM PHYSICS AT WORK	p.113
IV MULTILEVEL SYSTEMS AND TENSOR OPERATORS	p.167
Appendices	p.255
Index	p.263

please report errors to:

[dubbers@physi.uni-heidelberg.de](mailto:dubbers@physi.uni-heidelberg.de) or [stoeckmann@physik.uni-marburg.de](mailto:stoeckmann@physik.uni-marburg.de)

For a special topic therein see also (open access):

"Generalized Spin Precession Equations"

H.-J. Stöckmann and Dirk Dubbers

New Journal of Physics **16**, 053050 (2014)