



# Spin Dynamics: Basics of Nuclear Magnetic Resonance

*Malcolm H. Levitt*

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## **Spin Dynamics: Basics of Nuclear Magnetic Resonance** Malcolm H. Levitt

*Spin Dynamics: Basics of Nuclear Magnetic Resonance, Second Edition* is a comprehensive and modern introduction which focuses on those essential principles and concepts needed for a thorough understanding of the subject, rather than the practical aspects. The quantum theory of nuclear magnets is presented within a strong physical framework, supported by figures.

The book assumes only a basic knowledge of complex numbers and matrices, and provides the reader with numerous worked examples and exercises to encourage understanding. With the explicit aim of carefully developing the subject from the beginning, the text starts with coverage of quarks and nucleons and progresses through to a detailed explanation of several important NMR experiments, including NMR imaging, COSY, NOESY and TROSY.

Completely revised and updated, the Second Edition features new material on the properties and distributions of isotopes, chemical shift anisotropy and quadrupolar interactions, Pake patterns, spin echoes, slice selection in NMR imaging, and a complete new chapter on the NMR spectroscopy of quadrupolar nuclei. New appendices have been included on Euler angles, and coherence selection by field gradients. As in the first edition, all material is heavily supported by graphics, much of which is new to this edition.

Written for undergraduates and postgraduate students taking a first course in NMR spectroscopy and for those needing an up-to-date account of the subject, this multi-disciplinary book will appeal to chemical, physical, material, life, medical, earth and environmental scientists. The detailed physical insights will also make the book of interest for experienced spectroscopists and NMR researchers.

- An accessible and carefully written introduction, designed to help students to fully understand this complex and dynamic subject
- Takes a multi-disciplinary approach, focusing on basic principles and concepts rather than the more practical aspects
- Presents a strong pedagogical approach throughout, with emphasis placed on individual spins to aid understanding
- Includes numerous worked examples, problems, further reading and additional notes

### **Praise from the reviews of the First Edition:**

*"This is an excellent book... that many teachers of NMR spectroscopy will cherish... It deserves to be a 'classic' among NMR spectroscopy texts."* NMR IN BIOMEDICINE

*"I strongly recommend this book to everyone... it is probably the best modern comprehensive description of the subject."* ANGEWANDTE CHEMIE, INTERNATIONAL EDITION

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