

Springer

1st
edition1st ed. 2018, XXI, 156 p. 46
illus., 30 illus. in color.**Printed book**

Hardcover

Printed book

Hardcover

ISBN 978-3-030-00685-3

\$ 139,99

Available

Discount group

Professional Books (2)

Product category

Monograph

Series

Springer Theses

Other renditions

Softcover

ISBN 978-3-030-13142-5

Chemistry : Physical Chemistry

Lewis, Alan

Spin Dynamics in Radical Pairs

- Nominated as an outstanding Ph.D. thesis by the University of Oxford, England
- Explores new methods of simulating radical pair reactions and their application to real systems
- Provides a detailed discussion of the theory of spin dynamics

This book sheds new light on the dynamical behaviour of electron spins in molecules containing two unpaired electrons (i.e. a radical pair). The quantum dynamics of these spins are made complicated by the interaction between the electrons and the many nuclear spins of the molecule; they are intractable using analytical techniques, and a naive numerical diagonalization is not remotely possible using current computational resources. Hence, this book presents a new method for obtaining the exact quantum-mechanical dynamics of radical pairs with a modest number of nuclear spins. Readers will learn how a calculation that would take 13 years using conventional wavepacket propagation can now be done in 1 day, and will also discover a new semiclassical method for approximating the dynamics in the presence of many nuclear spins. The new methods covered in this book are shown to provide significant insights into three topical and diverse areas: charge recombination in molecular wires (which can be used in artificially mimicking photosynthesis), magnetoelectroluminescence in organic light-emitting diodes, and avian magnetoreception (how birds sense the Earth's magnetic field in order to navigate).

Order online at [springer.com/book sellers](https://www.springer.com/book sellers)

Springer Nature Customer Service Center LLC

233 Spring Street

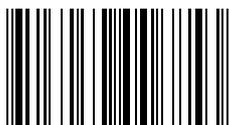
New York, NY 10013

USA

T: +1-800-SPRINGER NATURE

(777-4643) or 212-460-1500

customerservice@springernature.com



ISBN 978-3-030-00685-3 / BIC: PNR / SPRINGER NATURE: SCC21001

Prices and other details are subject to change without notice. All errors and omissions excepted. Americas: Tax will be added where applicable. Canadian residents please add PST, QST or GST. Please add \$5.00 for shipping one book and \$ 1.00 for each additional book. Outside the US and Canada add \$ 10.00 for first book, \$5.00 for each additional book. If an order cannot be fulfilled within 90 days, payment will be refunded upon request. Prices are payable in US currency or its equivalent.

Part of **SPRINGER NATURE**