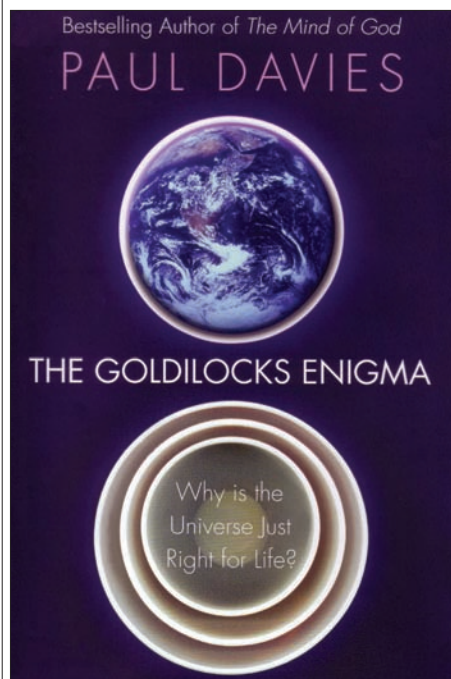


# BOOKSHELF

**The Goldilocks Enigma: Why is the Universe Just Right for Life?** by Paul Davies, Penguin – Allen Lane. Hardback ISBN 9780713998832, £22.00.



*The Goldilocks Enigma* is the latest in a series of books from the past 20-plus years by physicist, cosmologist and internationally acclaimed outreach expert Paul Davies, covering the often vexed issue of the boundary between science and theology. The central theme of this book is the baffling truism, the so-called anthropic principle, that the universe is surprisingly bio-friendly, consistent with the evolution of life, at least on Earth and possibly elsewhere. Like Goldilocks's third porridge, the universe seems to be just right for "us", but why?

Davies guides the reader comprehensively and comprehensibly through the properties and interactions of the components of the universe, small and large, observable and imagined. He presents an equation-free exposé of particle physics and cosmology, from strings to multiverses, and in so doing reveals the wonder of the physical universe. He then augments the "facts" with an impressive sequence of analyses of how and why they came about. But is "our" universe the only one that exists? Is it the only one that can exist? If so, why? If not, what, where and when could other universes be? And does it all point to an Intelligent Designer?

Getting rid of God, numinous, eternal and responsible for all universes at all times, is a popular pursuit for some science communicators these days – Richard Dawkins springs to mind. However Davies is not relentlessly driven to decide: "You can't use science to disprove the existence of a supernatural God, and you can't use religion to disprove the existence of self-supporting physical laws." This attitude ought to leave many an agnostic armchair physicist patiently waiting for Davies's next book.

*Goldilocks* is not always easy to read, but each chapter ends with a helpful shortlist of the important facts and ideas to be retained. A couple of typos and the erroneous statement, appearing twice, that the Large Hadron Collider will collide protons with antiprotons, blemish a text that otherwise bears all the hallmarks of intelligent design.

Peggie Rimmer, Satigny/Oxford.

## Books received

**Relativity: Special, General and Cosmological (Second edition)** by Wolfgang Rindler, Oxford University Press. Hardback ISBN 9780198567318, £55 (\$99.50). Paperback ISBN 9780198567325, £27.50 (\$49.50).

Relativistic cosmology has recently become an active and exciting branch of research. Consequently, this second edition mostly affects the section on cosmology, and the purpose remains the same: to make relativity come alive conceptually. The emphasis is on the foundations and on presenting the necessary mathematics, including differential geometry and tensors. With more than 300 exercises, it promotes an in-depth understanding and the confidence to tackle basic problems in this field. Advanced undergraduates and beginning graduate students in physics and astronomy will be interested in this book.

**Quantum Mechanics: Classical Results, Modern Systems, and Visualized Examples (Second edition)** by Richard W Robinett, Oxford University Press. Hardback ISBN 9780198530978, £39.95 (\$74.50)

This second edition is a comprehensive introduction to non-relativistic quantum mechanics for advanced undergraduate students in physics and related fields. It provides a strong conceptual background

in the most important theoretical aspects of quantum mechanics, and extensive experience of the mathematical tools required to solve problems. It also gives the opportunity to use quantum ideas to confront modern experimental realizations of quantum systems, and numerous visualizations of quantum concepts and phenomena. This edition includes many new discussions of modern quantum systems, such as Bose-Einstein condensates, the quantum Hall effect and wave-packet revivals.

**Data Analysis: A Bayesian Tutorial (Second edition)** by D S Sivia and J Skilling, Oxford University Press. Hardback ISBN 9780198568315 £39.95 (\$74.50). Paperback ISBN 9780198568322 £22.50 (\$39.50).

Statistics lectures can be bewildering and frustrating for students. This book tries to remedy the situation by expounding a logical and unified approach to data analysis. It is intended as a tutorial guide for senior undergraduates and research students in science and engineering. After explaining the basic principles of Bayesian probability theory, their use is illustrated with a variety of examples ranging from elementary parameter estimation to image processing. Other topics covered include reliability analysis, multivariate optimization, hypothesis testing and experimental design. This second edition contains a new chapter on extensions to the ubiquitous least-squares procedure.

**Field Theory: A Path Integral Approach (Second edition)** by Ashok Das, World Scientific. Hardback ISBN 9812568476 £45 (\$78). Paperback ISBN 9812568484 £28 (\$48).

This book describes quantum-field theory within the context of path integrals. With its utility in a variety of fields in physics, the subject matter is primarily developed within the context of quantum mechanics before going into specialized areas. Adding new material keenly requested by readers, this second edition is an important expansion of the popular first edition. Two extra chapters cover path integral quantization of gauge theories and anomalies, and a new section extends the supersymmetry chapter, describing the singular potentials in supersymmetric systems.