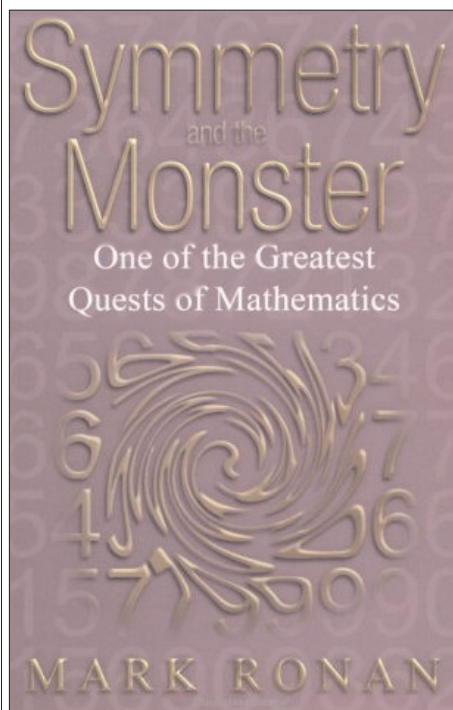


BOOKSHELF

Symmetry and the Monster: One of the Greatest Quests of Mathematics by Mark Ronan, Oxford University Press. Hardback ISBN 0192807226, £14.99 (\$27).



Simple symmetry groups are groups of geometric operations (rotations, reflections, etc) that cannot be decomposed into simpler groups. *Symmetry and the Monster* is about identifying and classifying the finite simple symmetry groups and discovering exceptions that do not fit into the overall pattern. The largest exception is the Monster. This book is the first telling of a mathematical odyssey spanning two centuries and the biographical accounts linking the technical sections are lively and informative, although they become more reticent as we reach modern times with living protagonists.

Ronan insists on calling simple groups the “atoms of symmetry” (atoms are not simple) and classifying them in “periodic tables”. However, even Ronan’s first table is mysterious, with Lie groups classified in

“families”, labelled A through G (rows), operating in dimensions 1 through 9 (columns). Ronan does not tell the reader what the family members have in common, but says that some groups don’t appear because they are not “simple” or are the same as others. For example, D3 is apparently the same as A3. And it doesn’t get any easier.

Oxford University Press considers this book “a must-read for all fans of popular science”. In his blog, Lieven le Bruyn, professor of algebra and geometry at the University of Antwerp, suggests that “Mark Ronan has written a beautiful book intended for the general public”. However, he goes on to say: “this year I’ve tried to explain [...] to an exceptionally good second year of undergraduates, but failed miserably [...] Perhaps I’ll give it another (downkeyed) try using *Symmetry and the Monster* as reading material”.

As an erstwhile mathematician, I found the book more suited to exceptional maths undergraduates than to the general public and would strongly encourage authors and/or publishers to pass such works before a few fans of popular science before going to press. *Peggie Rimmer, Satigny.*

Books received
Theory and Phenomenology of Sparticles: An Account of Four-Dimensional $N=1$ Supersymmetry in High Energy Physics by Manuel Drees, Rohini M Godbole and Prodir Roy, World Scientific. Hardback ISBN 9810237391, £62 (\$108). Paperback ISBN 9812565310, £37 (\$64).

A theoretical and phenomenological account of sparticles, this book provides a comprehensive, pedagogical and user-friendly treatment of the subject of four-dimensional $N=1$ supersymmetry, as well as its observational aspects in high-energy physics and cosmology. Search strategies for sparticles, supersymmetric Higgs bosons, nonminimal scenarios and cosmological implications are some of the many topics that are covered. Additional features include self-contained presentations of collider signals of

sparticles plus supersymmetric Higgs bosons and of supersymmetric cosmology.

Brane-Localized Gravity by Philip D Mannheim, World Scientific. Hardback ISBN 9812565612, £33 (\$58).

In this book the author provides a detailed introduction to the brane-localized gravity of Randall and Sundrum, in which gravitational signals can localize around our four-dimensional world in the event that it is a brane embedded in an infinitely sized, higher dimensional anti-de Sitter bulk space. Mannheim pays particular attention to issues that are not ordinarily covered in brane-world literature, such as the completeness of tensor gravitational fluctuation modes, and the causality of brane-world propagators. This self-contained development of the material that is needed for brane-world studies also contains a significant amount of previously unpublished material.

Iron Dominated Electromagnets: Design, Fabrication, Assembly and Measurements by Jack T Tanabe, World Scientific. Hardback ISBN 981256327X, £29 (\$48). Paperback ISBN 9812563814, £17 (\$28).

Written by one of the foremost specialists, this book is devoted to the design of low and medium field electromagnets, the field level and quality (uniformity) of which are dominated by the pole-shape and saturation characteristics of the iron yoke. *Iron Dominated Electromagnets* covers a wide scope of material ranging from the physical requirements for typical high-performance accelerators, through the mathematical relationships that describe the shape of two-dimensional magnetic fields, to the mechanical fabrication, assembly, installation and alignment of magnets in a typical accelerator lattice. Derived from lecture notes used in a course at Lawrence Livermore National Laboratory, it is a useful resource for students planning to enter high-energy physics, as well as those already working with particle accelerators.



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