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# Robin Harte: Spectral Mapping Theorems, A Bluffer's Guide, Springer, 2014. ISBN:978-3-319-05648-7 (ebook) 978-3-319-05647-0 (soft cover), GBP 24.11 (ebook) GBP 30.14 (softcover), 120+xiv pp.

REVIEWED BY ANTHONY W. WICKSTEAD

A bluffer's guide purports to pass on enough of the basics (and especially the jargon) of a subject that one can pass[1] as knowledgable about the subject without having to put in the effort that is required really to become knowledgable. Anyone who reads this book with such an aim is going to be disappointed. It is a serious mathematical monograph, albeit written in the rather eccentric style that we have come to expect of the author. The author's aim is to present enough spectral theory (for single elements, $n$-tuples or for infinite families) to reach spectral mapping theorems. He deliberately stops short of any notion of a functional calculus.

The book is divided into six chapters, the first two dealing with the algebraic and topological preliminaries that are required whilst the third brings these together to look at *Topological Algebra* including bounded operator theory. There follow chapters devoted to the spectral theory for the three cases of single elements, $n$-tuples and for infinite families. There is a bibliography of 294 items, of which over a hundred have Robin's name on the list of authors. The index is slightly disappointing, probably because of the lack of named theorems and definitions that I mention below. The table of contents is much more useful, as sections average just over two pages in length.

How, I can hear you asking, can he possibly do all this in a mere 120 pages? The answer, of course, is that proofs, and even precise statements in many cases, are conspicuous by their absence. The book is not set out in conventional Theorem-Proof format. I can, perhaps, best give a flavour of his style by comparing it to discussions that I had with Robin many years ago on beaches in West Cork when he attempted to give a very young mathematician a flavour of what

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[1]At least if not examined too carefully!

he was working on. He gives the salient definitions and formulae in a very conversational manner whilst hiding a lot of the hard work that is needed to understand everything completely. For example, §5.6 describes tensor products for vector spaces, normed spaces, algebras, Banach algebras and modules in a little over three pages!

So who is this book best suited for? I guess anyone who, for whatever reason, wants to learn more than the basics of spectral theory of one variable or to learn something of the spectral theory of more than one variable. This book on its own won't be adequate either to become an expert in the area or even to pretend that you are. Nor will it be a useful source of references to cite, if only because the unconventional format makes it virtually impossible to refer to it for major results. Unfortunately, the lack of citations within the text makes it difficult to follow up from the overview that this book gives and obtain more details. I certainly cannot recommend this for starting-out mathematicians to learn the subject on their own, in spite of the very basic starting point that is assumed. It would, however, be an excellent text for a group of young mathematicians to adopt as a starting point for a working seminar that filled in the details over the space of a year or so. All that being said, the right reader will find this a very useful way to get started out in this area. I certainly plan to add it to my own mathematical library.

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