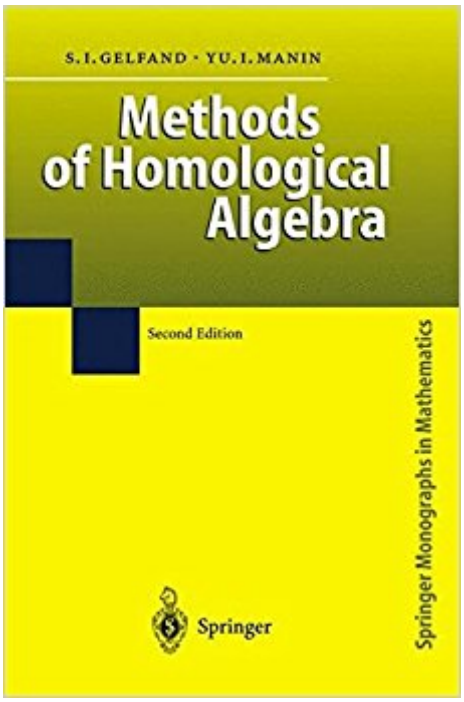
Methods Of Homological Algebra



Synopsis

This modern approach to homological algebra by two leading writers in the field is based on the systematic use of the language and ideas of derived categories and derived functors. It describes relations with standard cohomology theory and provides complete proofs. Coverage also presents basic concepts and results of homotopical algebra. This second edition contains numerous corrections.

Book Information

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Customer Reviews

From the reviews of the second edition: "This is the revised edition of a modern approach to homological algebra by two leading writers in the field. It is based on the systematic use of the language and technics of derived categories and derived functors. The reader has all the basic material and a lot of examples â | . This book can be used by students just beginning to study homological algebra, as well as by specialists who will find there some points which have never been clarified in the literature." (Jean-Claude Thomas, Belgian Mathematical Society â “ Simon Stevin Bulletin, Vol. 10 (2), 2003) "It is a pleasure to have on the desk this second edition from a new classical text in mathematics. â | this text has to be seen as part of the general process of unification in mathematics." (Bernd Richter, Zentralblatt MATH, Vol. 1006, 2003)

Text: English (translation) Original Language: Russian

Homological algebra is one of those subjects that in order to understand, you need to know already. Category theory wouldn't hurt either, nor some algebraic geometry and algebraic topology. Unfortunately, you need to know homological algebra to do some of these things as well. The great strength of Gelfand and Manin's work is that it ties together examples from all of these areas and coherently integrates them into some of the best mathematical prose I've ever read. The book is recent enough that its authors write from a position of vast perspective on fifty years of research, and the subject as they present it is about as up-to-date as possible, yet cleanly developed and not overwhelming. Unlike many books whose subject matter was influenced by modern algebraic geometry, this one does not merely pay lip service to standard references on its vast prerequisites, but systematically develops them (specifically, the ideas of category theory and abelian categories) in an entire, large chapter.The book's only tangible drawback is the presence of errors, despite the revision. The previous edition was said to be riddled with them, and the authors have indeed brought the count down to a nearly respectable level, with those remaining relatively minor. The remaining errors are more jarring than confusing, however, and this is not a sticking point.Finally, I would like to emphasize that neither this book nor any other is suitable for beginners in homological algebra. This is an aspect of the field, and its remedy is to study the applications, algebraic geometry and algebraic topology most of all. The ideas of homological algebra are derived not from first principles but from mathematicians' experiences doing mathematics, and both the subject matter and the many excellent examples in the book will resonate more with a student whose knowledge they cast in a new light.

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