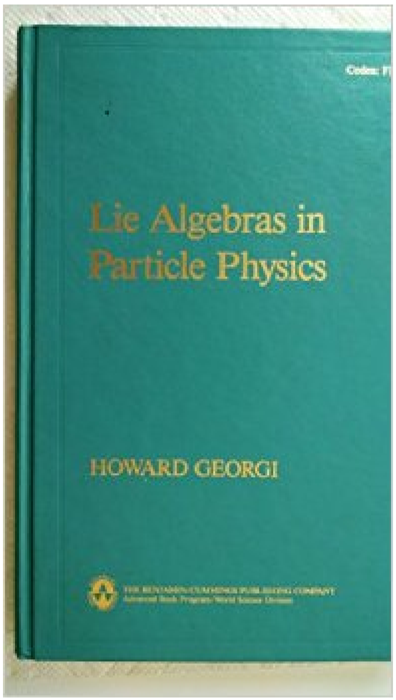
# Lie Algebras In Particle Physics: From Isospin To Unified Theories (Frontiers In Physics, Vol. 54)



## Synopsis

An exciting new edition of a classic text --This text refers to the Paperback edition.

## Book Information

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## Customer Reviews

Prof. Georgi’s books is one of those books where, when you read it the first time it is terse and hard to learn from, and then every time you re-read it it seems better and better. I have to say, though, that no matter how many times you read the book, there are some things that you just might never understand. It is not that the math is complicated, but rather that Georgi explains lots of things in words, and his words are often difficult to follow. For example, I still don’t understand how he constructed the baryon octet wavefunctions, because the entire procedure was described in one cryptic sentence.I took Prof. Georgi’s class and found it quite frustrating occasionally, and I found that there was no other book that you could turn to for help. All the other books either cover group theory purely mathematically or seem to be very advanced particle physics texts. By the way, I disagree with the previous reviewer’s comments that you need to know any particle physics before reading this book; I didn’t know any and I did fine.The problems at the end of the chapter are very good in terms of testing your understanding. I don’t think there is a single problem that involves tedious algebra, and yet many of them are quite tricky and I remember pulling all-nighters to do a problem that, once we figured it out, took three lines.Anyway, Georgi’s book is good in the sense of being very original, very complete, challenging, and fascinating. However, the drawback is that it is occasionally quite confusing. Overall, it can be a very good textbook, if you have a clear professor to decipher it for you and fill in the gaps.

This book is good for what it is, namely, something to get your feet wet. When learning the basics of particle physics, e.g. as an undergrad or a beginning experimentalist, this is the quickest way to get a feel for the standard model gauge group. However, this is *not* a complete text on group theory in particle physics (and therefore, little of what you need for supersymmetric field theories and string theories). So in addition to this book, you'd need something else with an introduction to the other things you need for your particular interest. Try Gilmore's "Applications of Lie algebras...", which I believe is out of print (in libraries). Also, Cornwell's abridged "Group theory in physics" is good (though if you can find the older set of three volumes, that may be more suited to your desires). I don't suggest many of the other books on group theory for particles/fields/strings. There are tidbits of group theory you can pick up in the particular text you are working with, e.g. "Quantum theory of Fields" by Weinberg if you are learning quantum field theory. For mathematical physics in general, I strongly suggest "Gauge fields, knots, and gravity" (John Baez), "Differential Geometry for physicists" (Chris Isham), and "Mathematical Physics" (Geroch).

good supplement of introductory quantum field theory. particle physics books often have aggressiveness but this is in a relaxed mood, apt for reading in fine sunday mornings. 27 chapters in 300 pages, short chapters, without one for manifold and topology. from this book you can't get a mathematically deep understanding of Lie algebra nor exotic viewpoint for particle/string, but that's not this is for. i hope someday this will be included in Dover classics.1.finite groups 2.Lie groups 3.SU(2) 4.tensor operators 5.isospin 6.roots and weights 7.SU(3) 8.simple roots 9.more SU(3) 10.tensor methods 11.hypercharge and strangeness 12.Young tableaux 13.SU(n) 14.3-d harmonic oscillator 15.SU(6) and the quark model 16.color 17.constituent quarks 18.unified theories and SU(5) 19.classical groups 20.classification theorem 21.SO(2n+1)and spinors 22.SO(2n+2)spinors 23.SU(n)

I had a copy of this book in graduate school, on loan from our library. I found it to be a good introduction to Lie Algebra in general and its application to describing the spectrum of mesons and hadrons found in particle physics. I was glad to find it on line and it was one of the first books I purchased for my personal library as a physicist.

If I wasn't reading this side by side with a professor, many parts of it would have been baffling. There are two areas especially where something is presented as though proven but isn't actually proven. I would recommend this only if you have a professor to consult, if you don't intend to read every proof line-by-line, or if you are using it for review

I know Lie Algebras from the mathematical side. I expected the author to give a physical argument of why it was applicable to elementary particles. He tries sort of, but mostly bluffs his way through the math and uses symbols of his own without defining them. I gave it two stars because nevertheless I was able to glean some little bits of insight from the book, but unfortunately not much.

A nice book that lacks a common theme. Georgi was one of the first who wrote down a Grand Unified Theory, so he knows quite some group theory and why it is important in physics. Nevertheless, this vast knowledge does not transfer directly to great didactical explanations. The book seems to me as piecemeal. Some chapters were quite nice, others seemed really irrelevant and I didn't understand why they are there. Nowadays there are several books that offer better explanations of these topics, but Georgi's book will of course remain a classic and some chapters are still useful. As lang as one does not expect a book that is read from cover to cover I can recommend this book

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