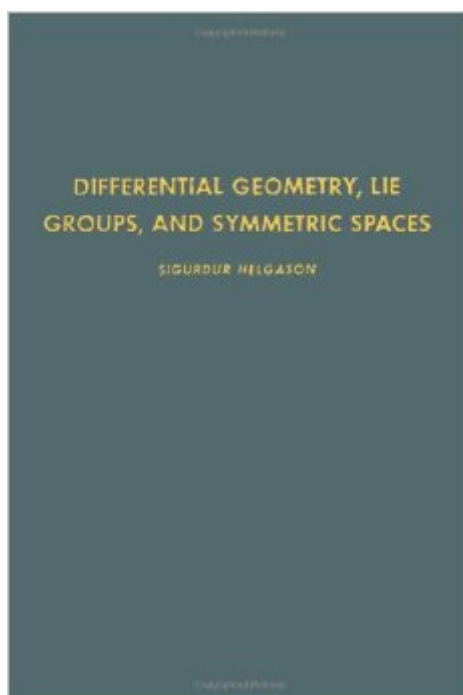# Differential Geometry, Lie Groups, And Symmetric Spaces, Volume 80 (Pure And Applied Mathematics)

Synopsis

The present book is intended as a textbook and reference work on three topics in the title. Together with a volume in progress on "Groups and Geometric Analysis" it supersedes my "Differential Geometry and Symmetric Spaces," published in 1962. Since that time several branches of the subject, particularly the function theory on symmetric spaces, have developed substantially. I felt that an expanded treatment might now be useful.

Book Information

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Customer Reviews

As I reviewed this book at , I found only one review, which I considered to be too harsh. You should understand that Helgason is writing a graduate textbook. Students will learn about "modules" in their graduate algebra course. They will learn De Rham's theorem in an introductory analysis course or sometimes even in a topology course (yes, it can happen). So, most of the language for which another reviewer criticized him would usually be covered in other graduate courses.Helgason writes tersely but extremely precisely. I know of no other author who gives similar sophistication of point of view and quick, to the point, proofs. He is a "best of breed," and I suppose that is part of the reason he has been a core member of the faculty at M.I.T. for such a long time. A serious student cannot really avoid reading the entire progression of these texts, particularly the "Groups and Geometric Analysis" title, perhaps second in the Helgason manuscripts.

I'm not qualified to say much about this book, but I think it's excellent and thought it deserved a

higher rating. Besides being remarkably clear (much like the cold air of Helgason's home country of Iceland), I think it's a great, wonderful bridge between the original works in Lie theory and the more basic textbook treatments of DG and Lie theory out there (Warner, do Carmo, Lee, ...), many of which are quite good. It is filled with references and citations to original papers (some by the author) and is perhaps more connected to the historical genesis of the subject than other textbooks."A great book... a necessary item in any mathematical library." -S.S. Chern

As an engineer who is currently applying the theory of symmetric spaces, I realize that there is no other book that can teach you the same stuff (O. Loos's book is far too algebraic and what I really need is (Pseudo-)Riemannian symmetric spaces, not those affine stuffs...).I find the book difficult to follow from time to time, but I guess its because I barely finished Boothby's An intro to diff mfd and riemannian geometry. Yet as I hang on a little longer, I started to learn on multiple levels and even felt more confident about differential geometry as a result (before, I tried Nomizu and Kobayashi, but it didnt work for me). If you are also an engineer, I would highly recommend you to finish Boothby first (which would then require 1 or 2 companion books, such as Munkres and maybe Abraham, Marsden, Ratiu) and come back to read Ch 1&2. Ch3 on semi-simple lie algebra is a little demanding, so Humphrey might be a good first reading. The rest of the book is on symmetric spaces. I would recommend not to read them all but to read only what you need.The only thing dissatisfying is that there are too few examples. But I guess its not a textbook anyway.

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