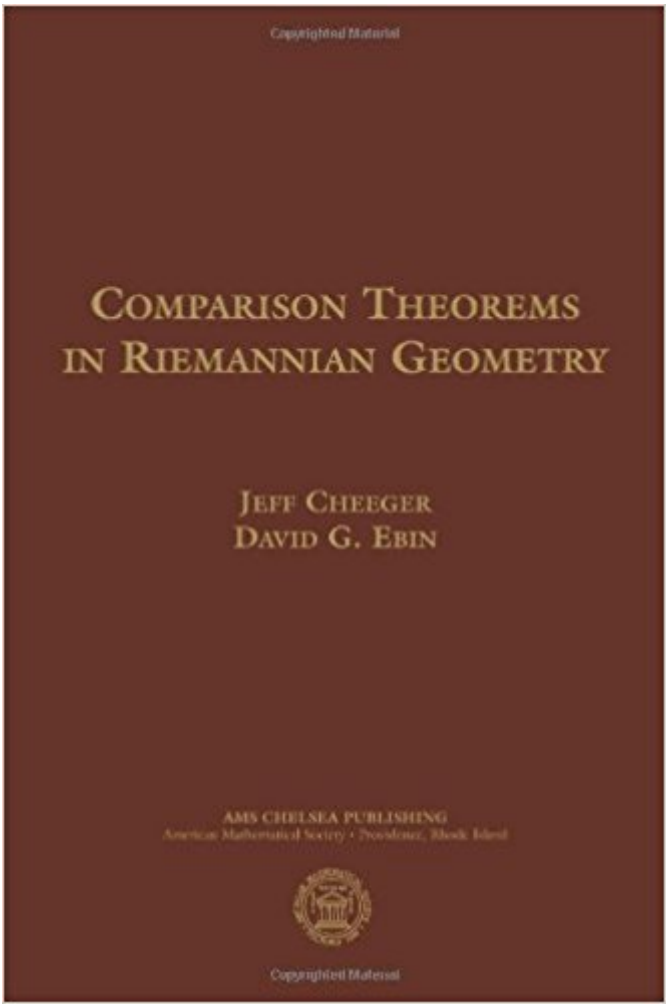
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Comparison Theorems In Riemannian Geometry (Ams Chelsea Publishing)



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Synopsis

The central theme of this book is the interaction between the curvature of a complete Riemannian manifold and its topology and global geometry. The first five chapters are preparatory in nature. They begin with a very concise introduction to Riemannian geometry, followed by an exposition of Toponogov's theorem--the first such treatment in a book in English. Next comes a detailed presentation of homogeneous spaces in which the main goal is to find formulas for their curvature. A quick chapter of Morse theory is followed by one on the injectivity radius. Chapters 6-9 deal with many of the most relevant contributions to the subject in the years 1959 to 1974. These include the pinching (or sphere) theorem, Berger's theorem for symmetric spaces, the differentiable sphere theorem, the structure of complete manifolds of non-negative curvature, and finally, results about the structure of complete manifolds of non-positive curvature. Emphasis is given to the phenomenon of rigidity, namely, the fact that although the conclusions which hold under the assumption of some strict inequality on curvature can fail when the strict inequality on curvature can fail when the strict inequality is relaxed to a weak one, the failure can happen only in a restricted way, which can usually be classified up to isometry. Much of the material, particularly the last four chapters, was essentially state-of-the-art when the book first appeared in 1975. Since then, the subject has exploded, but the material covered in the book still represents an essential prerequisite for anyone who wants to work in the field.

Book Information

Series: Ams Chelsea Publishing
Hardcover: 161 pages
Publisher: American Mathematical Society (August 4, 2008)
Language: English
ISBN-10: 0821844172
ISBN-13: 978-0821844175
Product Dimensions: 0.5 x 7.2 x 10.2 inches
Shipping Weight: 1 pounds (View shipping rates and policies)
Average Customer Review: 3.5 out of 5 stars 6 customer reviews
Best Sellers Rank: #530,144 in Books (See Top 100 in Books) #19 inÂ Books > Science & Math > Mathematics > Geometry & Topology > Non-Euclidean Geometries #57 inÂ Books > Science & Math > Mathematics > Geometry & Topology > Differential Geometry #67 inÂ Books > Science & Math > Mathematics > Geometry & Topology > Analytic Geometry

Customer Reviews

This book summarizes the 1975 state of the art regarding global topological consequences of bounds on sectional curvature. The inside back cover summarizes the book very well indeed. The "Book description" is copied from there. Just read that. It’s an honest summary.The book "Comparison Theorems in Riemannian Geometry", by Cheeger and Ebin, is for researchers at the postgraduate, postdoctoral and professional levels. In view of the 1975 vintage, it has great value as a relatively easy introduction to the research project "geometry implies topology" for Riemannian spaces, but also to better understand the current state of the art in the context of its historical development. More recent summaries, such as the 1994 "Lectures on Differential Geometry" by Schoen and Yau, can be quite overwhelming. It’s better to read up on earlier research results first to see the context in which later researchers worked.The Cheeger/Ebin book is widely cited in later research. So it’s an essential reference if you’re serious about researching the flavour of differential geometry which seeks to put constraints on topology in terms of given bounds on curvature. The design of the book is well thought out and implemented. There are not many modern books on DG at this level which make so much effort to be comprehensible to the beginner. It even has lots of nice diagrams!

This review only applies to the AMS Chelsea edition. I’m in graduate school and working through this with a few other students who are using the original edition that they got from the library. There are NUMEROUS errors in this edition that are not in the original. There were three on a single page in a section I was reading today. If you can avoid buying this edition, do it.

This book is the reprinted version of 1976’s version. It is a classical reference on comparson geometry and Riemannian geometry. Dr. Ebin and Cheeger are two great master in the field of Riemannian geometry. Therefore, it is valuable.

So many tiny mistakes! I can not believe that this is a book written 40 years ago. So upset about it.

But thought the book was out of print. This classic book was published by North Holland in the late seventies, was photocopied by every grad student in geometry, and finally has been reprinted by the American Math Society. The book’s goal (achieved) is to get you up to speed and working as quickly as possible. Riemannian geometry is covered from scratch (a la Milnor’sÂ Morse Theory (Annals of Mathematic Studies AM-51)Â but they don’t stop there, and prove all of the basic

comparison results.

I am of course partial to the book ,I was graduate student at SUNY Stony Brook.Still, I think this is the basic reference in the subject , a book that I liketo go back to review the most important theorems. Clear, consise ,well written. It is quite impissible to work in Riemanian Geometry without "Cheeger Ebin"

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