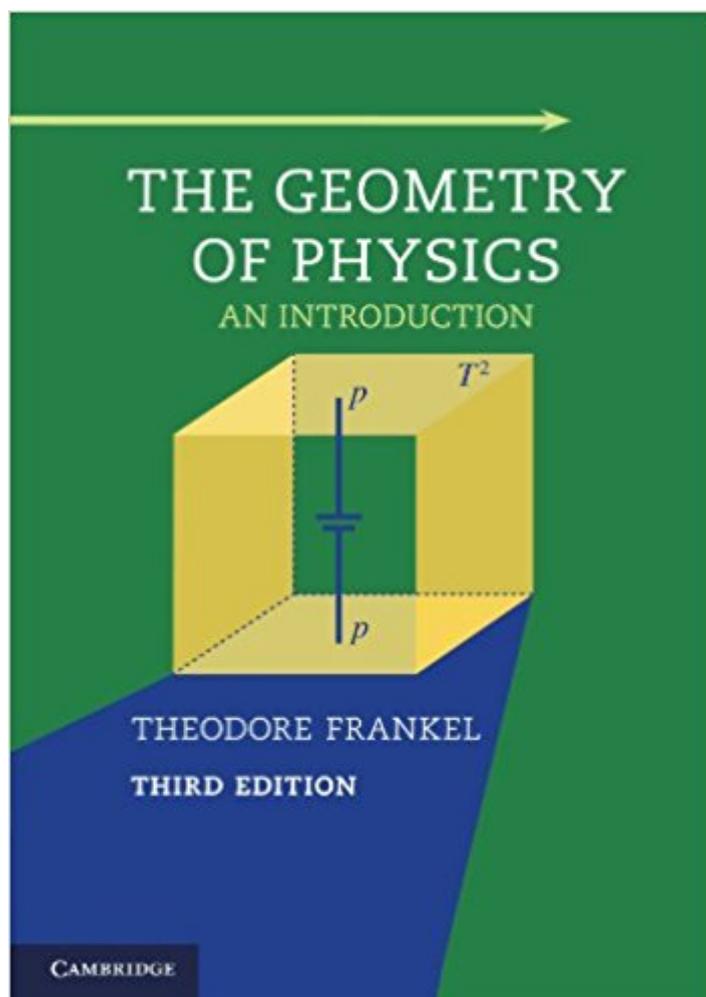


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The Geometry Of Physics: An Introduction



Synopsis

This book provides a working knowledge of those parts of exterior differential forms, differential geometry, algebraic and differential topology, Lie groups, vector bundles, and Chern forms that are helpful for a deeper understanding of both classical and modern physics and engineering. It is ideal for graduate and advanced undergraduate students of physics, engineering or mathematics as a course text or for self study. A main addition introduced in this Third Edition is the inclusion of an Overview, which can be read before starting the text. This appears at the beginning of the text, before Chapter 1. Many of the geometric concepts developed in the text are previewed here and these are illustrated by their applications to a single extended problem in engineering, namely the study of the Cauchy stresses created by a small twist of an elastic cylindrical rod about its axis.

Book Information

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Customer Reviews

Some texts are designed to increase understanding, others to aid in practical computation, making them as much references as pedagogic tools. The latter are especially suited for self study. In this new edition, Frankel does something amazing-- instead of completely reorganizing an already stellar text, he "ties it all together" with a new "example" introduction-- a 34 page (roman numeral numbered!) "preface" illustrating Cartan's exterior differential forms with a "metal torsion" example application to Cauchy's stress tensor. Don't mistakenly think that this means Frankel limits this text to the differential geometry of engineering mechanics and materials-- he covers a vast field of physics all the way from classic to quantum, sans string but with numerous gauge applications, in 750

packed pages, most containing fully worked out calculations for the aforementioned reference value. It seems today that all publishers just parrot "for grad students or advanced undergrads with a year of calculus and some linear algebra." Is this to sell more books? Not sure, but I wouldn't tackle this for self study or even calculative reference without "advanced" calculus (in my definition, analysis) PLUS a good course in analytic geometry first. Although this is packed with AG, it does not start by teaching AG-- the geometry knowledge is assumed, and we're then treated to an astonishing adventure of detailed APPLICATIONS of geometry to nearly every aspect of physics, including numerous cutting edge and intractable problems. There also are NUMEROUS engineering applications examples, blending physics, engineering and geometry in a way no other text even attempts. I've long felt that some pundits who tease the Greeks for seeing everything as geometric would someday eat their words. Well..

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