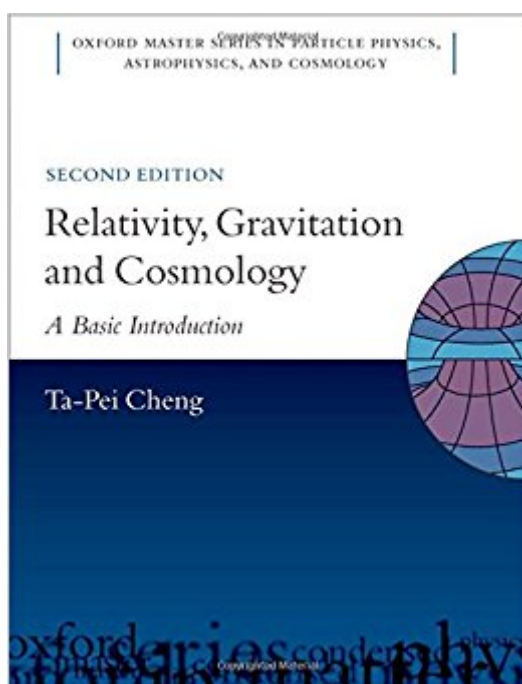


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Relativity, Gravitation And Cosmology: A Basic Introduction (Oxford Master Series In Physics)



Synopsis

Einstein's general theory of relativity is introduced in this advanced undergraduate and beginning graduate level textbook. Topics include special relativity, in the formalism of Minkowski's four-dimensional space-time, the principle of equivalence, Riemannian geometry and tensor analysis, Einstein field equation, as well as many modern cosmological subjects, from primordial inflation and cosmic microwave anisotropy to the dark energy that propels an accelerating universe. The author presents the subject with an emphasis on physical examples and simple applications without the full tensor apparatus. The reader first learns how to describe curved spacetime. At this mathematically more accessible level, the reader can already study the many interesting phenomena such as gravitational lensing, precession of Mercury's perihelion, black holes, and cosmology. The full tensor formulation is presented later, when the Einstein equation is solved for a few symmetric cases. Many modern topics in cosmology are discussed in this book: from inflation, cosmic microwave anisotropy to the "dark energy" that propels an accelerating universe. Mathematical accessibility, together with the various pedagogical devices (e.g., worked-out solutions of chapter-end problems), make it practical for interested readers to use the book to study general relativity and cosmology on their own.

Book Information

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Customer Reviews

The book "... is perhaps a bit modest in its title: Comprehensive rather than Basic is probably more appropriate. This second edition expands upon the 2005 textbook, which is a

'Physics First' presentation of relativity and cosmology." --- Journal of General Relativity & Gravitation (2011) 43:359-360. Review from previous edition: "This is a great time to have published a fresh new undergraduate text on relativity and cosmology...this is an excellent textbook which this reviewer would rate as the text of choice for a course on relativity and cosmology aimed at physics and astronomy undergraduates." --American Journal of Physics

Ta-Pei Cheng is currently Emeritus Professor of Physics at the University of Missouri - St. Louis. He took his Ph.D. at Rockefeller University in 1969, followed by post-doctoral study at Rockefeller University and at the Institute for Advanced Study (Princeton). He has been on the faculty of University of Missouri - St. Louis from 1973 to the present day, and was elected a Fellow of the American Physical Society in 1982.

A very well written text. Ideas and concepts are presented clearly. If you are just starting GR, this is an excellent text. However if you are looking for a text to use as a reference to review specific topics this is probably not the book to buy. The author introduces each topic in a very gradual manner (to help the beginning student) and this results in partial explanations being spread throughout the text. Just understand what you're looking for.

The book presents the best known intriguing and beautiful aspects of general relativity such as black holes, the big bang and the expansion of space. The author took care to make it as understandable as possible by a plenty of good explanations and by using the easier settings such the spherically symmetrical ones. I have an Msc in electrical engineering and I like physics. I barely managed to understand the main parts of the book after reading each chapter a few times. It was a great experience and it took many weeks.

This book provides a basic introduction to cosmology without complicated mathematics. While I enjoy higher level math and physics, I wanted a cosmology book that would provide the basics with simple conceptual descriptions. This book provided me with what I was looking for.

Simply an awesome book. The mathematics are walked through in a easy to read manner. The text is very insightful and clearly written. The problems are very good and interesting.

This book has a fairly comprehensive introduction to gravitational waves (Chapter 15) -- currently of

interest from the perspective of the Inflationary Theory of cosmology. Recommended for an intro to this aspect of cosmology.

I love this book on General relativity and cosmology. It is fun to read and covers tensor analysis latter in the book. It doesn't assume that you already know tensor analysis, but it does require understanding calculus and differential equations. It is an undergraduate text though.

Best introduction to GR.

satisfied, A+

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