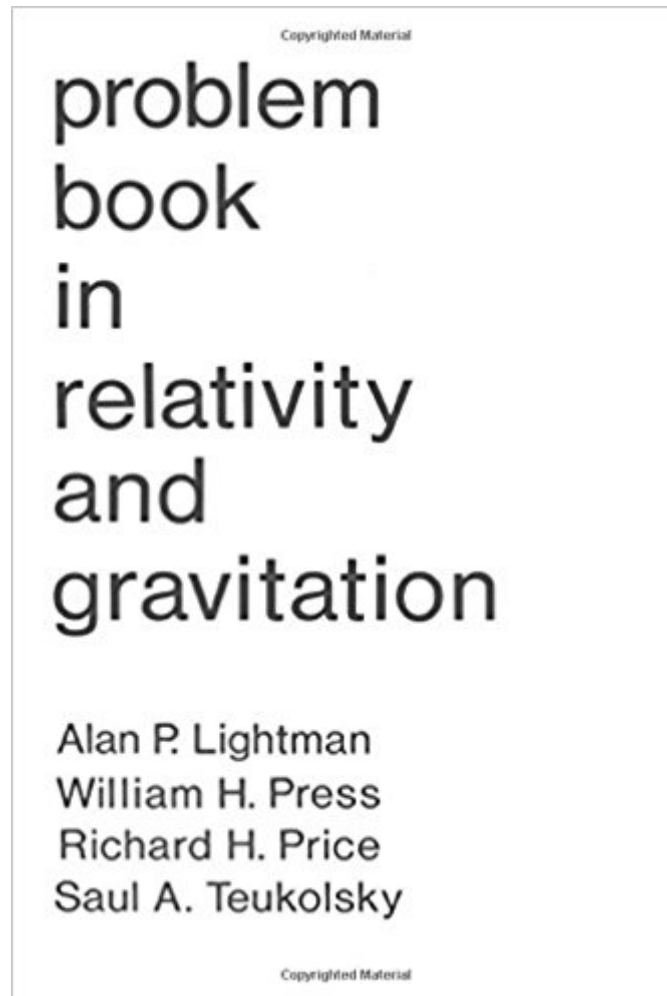




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Problem Book In Relativity And Gravitation



Synopsis

An essential resource for learning about general relativity and much more, from four leading experts! Important and useful to every student of relativity, this book is a unique collection of some 475 problems--with solutions--in the fields of special and general relativity, gravitation, relativistic astrophysics, and cosmology. The problems are expressed in broad physical terms to enhance their pertinence to readers with diverse backgrounds. In their solutions, the authors have attempted to convey a mode of approach to these kinds of problems, revealing procedures that can reduce the labor of calculations while avoiding the pitfall of too much or too powerful formalism. Although well suited for individual use, the volume may also be used with one of the modern textbooks in general relativity.

Book Information

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Customer Reviews

"This book is a classic and easily the best way for students learning general relativity to get experience doing problems. A wide variety of topics are covered and extensive solutions are given to the insightfully formulated exercises. This is a wonderful tool for becoming an expert in a beautiful subject."--Sean Carroll, author of *Spacetime and Geometry: An Introduction to General Relativity*"When you first meet them, special and general relativity seem absurd and paradoxical. When you finally reach the point of understanding them, they make perfect sense, but the only way to get there is by solving problems. This classic text is an invaluable resource for students wanting to make this journey."--John Baez, University of California, Riverside

Praise for the original edition:

"This work is full of interesting problems, arranged by subject and graded by difficulty. It is full of

intellectual content, and it is much more than modern pedagogy. It is modern physics, much of it at the frontiers, done in modern ways."--John A. Wheeler, Princeton University

Alan P. Lightman is professor of the practice of the humanities at the Massachusetts Institute of Technology. His books include *Screening Room* and *Einstein's Dreams*. William H. Press is the Warren J. and Viola M. Raymer Professor in Computer Science and in Integrative Biology at the University of Texas, Austin. Richard H. Price is senior lecturer in physics at the Massachusetts Institute of Technology. He is the coeditor of *Black Holes*. Saul A. Teukolsky is the Hans A. Bethe Professor of Physics and Astrophysics at Cornell University and the coauthor of *Black Holes, White Dwarfs and Neutron Stars*. Press and Teukolsky are coauthors in the *Numerical Recipes* book series.

This book is a must-have for any serious student of relativity who doesn't simply want to "have done" some GR at the end of his undergraduate, or beginning graduate studies. No, this book is capable to have YOU learn (instead of teaching you!) true relativity. By the time you finish this book you'll be capable to DO general relativity at the same level you can do classical mechanics. You'll have been exposed to almost all, if not all, of the modern concepts in general GR. You'll have developed a working intuition about GR and will have the tools to understand physical systems that require GR. Granted, it doesn't cover everything in the universe. This is not a book on mathematical relativity, and you won't be proving theorems à la Hawking & Ellis. It isn't a book on numerical relativity either, neither is it a book on advanced methods on GR (say, asymptotia, spinors). For these specific topics, there are excellent bibliographies. But if you want to DO exercises in GR, and have fun with some amazing insights (as it is written by some of the greatest relativists around), and proudly say you actually know general relativity, this book is for you.

Very nice book. makes it very difficult to formulate new problems in general relativity.

Very useful for seeing how problems are worked out and providing lots of examples of exactly how the math is done.

This is a great resource for those who learn best by working through problems. The problems are far from simple and cover everything from coordinate transformation to Differential Geometry to Black Holes and Cosmology. The authors are all authorities on the subject à la Hawking & Ellis and

presumably, some of the problems are part of their ongoing research. FYI - For those interested in similar 'self-learning' books on relativity, here is a list (compiled by me, fairly recently): <http://www.anujvarma.com/rare-finds-in-special-and-general-theory-of-relativity/>

The "Problem Book" is a remarkable resource for learning GR as well as physics in curved spaces and some aspects of cosmology. Targeted to advanced undergraduate and graduate students, it constitutes an essential test in convincing yourself that you know how to think like a relativist -- that you have actually understood GR -- rather than ground through some (by now more or less standardized) math and learnt some calculational techniques. There's nothing else like it. Written by masters of classical relativity, the Problem Book is far more than a very interesting set of problems that illuminate many aspects of spacetime physics. While that in itself is a major accomplishment, a key value of the book lies in the terse disciplined elegance of the solutions. Want to know if GR is something you might want to get into? Dig into the Problem Book -- if you are delighted by what you find, welcome to the club.

This book is now free at <http://www.nrbook.com/relativity/> "The Problem Book in Relativity and Gravitation... is now available free online at <http://www.nrbook.com/relativity/> The publisher, Princeton University Press, has generously given permission for this. The book remains in print and available for purchase." Saul Teukolsky

I've owned the book for a number of years and find I keep referring to it for solutions and methods time and again. Like quantum theory there are relatively few problems with exact solutions in GR and this book has many of the classics worked out in detail. The authors are from the peak of the golden age of GR and share their honed talents with the rest of us. This resource is a must have for anyone who works out problems in GR.

This is a capital book for all the Physics students, it give a good overview of the theory through a huge set of problems of the main parts in the theory. Good exercises and understandable solutions, that will make you easier the way to understand General relativity. I think this book has the key to fully understand Einstein gravitation. A good choose !

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