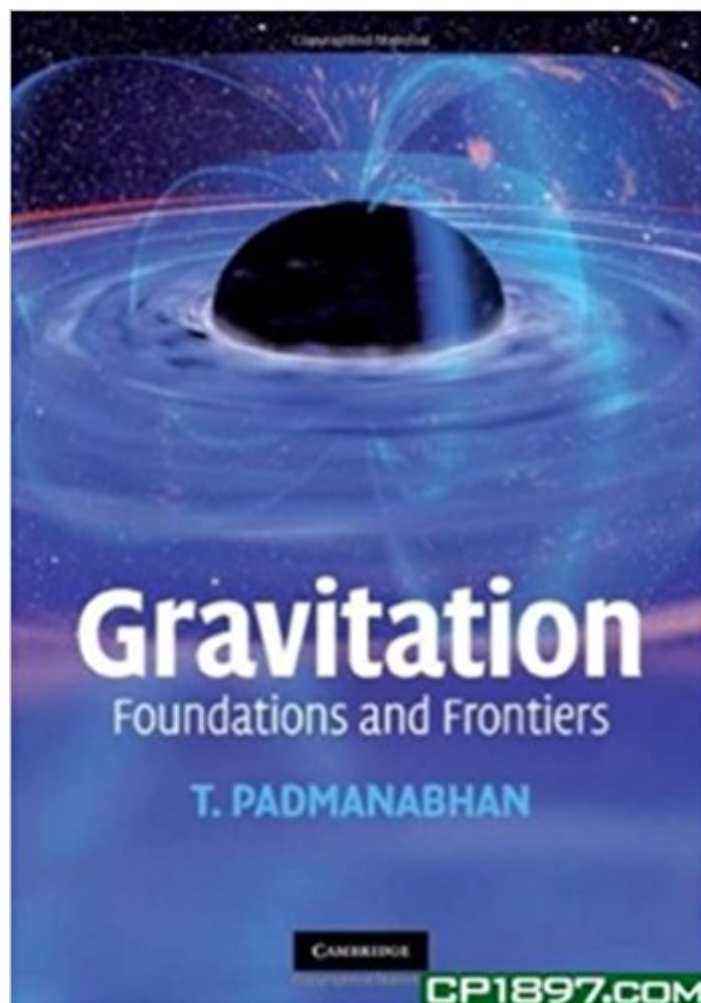


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# Gravitation: Foundations And Frontiers



## Synopsis

Covering all aspects of gravitation in a contemporary style, this advanced textbook is ideal for graduate students and researchers in all areas of theoretical physics. The 'Foundation' section develops the formalism in six chapters, and uses it in the next four chapters to discuss four key applications - spherical spacetimes, black holes, gravitational waves and cosmology. The six chapters in the 'Frontier' section describe cosmological perturbation theory, quantum fields in curved spacetime, and the Hamiltonian structure of general relativity, among several other advanced topics, some of which are covered in-depth for the first time in a textbook. The modular structure of the book allows different sections to be combined to suit a variety of courses. Over 200 exercises are included to test and develop the reader's understanding. There are also over 30 projects, which help readers make the transition from the book to their own original research.

## Book Information

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## Customer Reviews

It's surprising this book hasn't received any reviews here. This is possibly one of the finest general relativity textbooks existing today. Superbly modern in its exposition of the general relativity. If you're asking why the IRF moves on geodesics, you'll find the answer to that here. If you're wondering why the relativistic Lagrangian is integral of  $mc^2 ds$ , you'll find the answer to that here, rather than shady arguments used in other books. Practically everything here is derived from variational principles, so GR just feels so natural. It's hard to believe that GR could even be thought of in such an eye-opening way. I can only imagine what a good expositor Professor Padmanabhan is like in real life. The Pros of the book: \*The most illuminating problems and projects not present in

any other book.\*Clear, concise writing and conceptual detail\*Covers modern topics like QFT in curved spacetime (I haven't gotten here yet though)\*Gives an introduction to the formulation of GR using differential forms\*The only prerequisites are some analytical mechanics at the level of Goldstein, some basic electrodynamics, and some special relativity. He doesn't even assume any familiarity with 4 vectors. However, a prior acquaintance with GR would be good to have, I learnt my GR the first time with Hobson, Efstathiou and Lasenby, and then moved to this.\*Almost no typos.The Cons:\*Cosmology section is very brief and this could have been expanded greatly. This was disappointing and it felt like a stumble in the book. Then again, this is hardly an issue considering the entire book.In all, this book is pure gold. If 6 stars were available, I'd give it that.

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