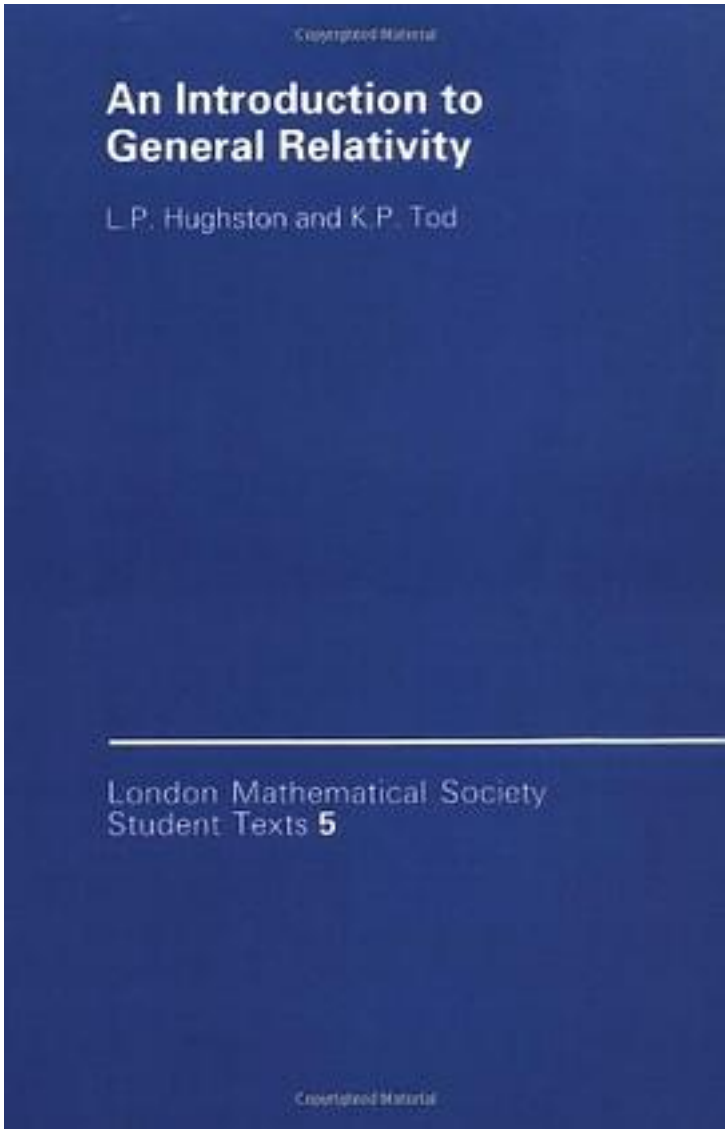
An Introduction to General Relativity



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This textbook provides an introduction to general relativity for mathematics undergraduates or graduate physicists. After a review of Cartesian tensor notation and special relativity the concepts of Riemannian differential geometry are introducted. More emphasis is placed on an intuitive grasp of the subject and a calculational facility than on a rigorous mathematical exposition. General relativity is then presented as a relativistic theory of gravity reducing in the appropriate limits to Newtonian gravity or special relativity. The Schwarzchild solution is derived and the gravitational red-shift, time dilation and classic tests of general relativity are discussed. There is a brief account of gravitational collapse and black holes based on the extended Schwarzchild solution. Other vacuum solutions are described, motivated by their counterparts in linearised general relativity. The book ends with chapters on cosmological solutions to the field equations. There are exercises attached to each chapter, some of which extend the development given in the text.

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