



# Exact Space-Times in Einstein's General Relativity (Cambridge Monographs on Mathematical Physics)

*By Jerry B. Griffiths, Jiří Podolský*

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Einstein's theory of general relativity is a theory of gravity and, as in the earlier Newtonian theory, much can be learned about the character of gravitation and its effects by investigating particular idealized examples. This book describes the basic solutions of Einstein's equations with a particular emphasis on what they mean, both geometrically and physically. New concepts, such as big bang and big crunch-types of singularities, different kinds of horizons and gravitational waves, are described in the context of the particular space-times in which they naturally arise. These notions are initially introduced using the most simple and symmetric cases. Various important coordinate forms of each solution are presented, thus enabling the global structure of the corresponding space-time and its other properties to be analyzed. The book is an invaluable resource both for graduate students and academic researchers working in gravitational physics.

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#### **Review**

"This is a resource monograph well balanced between a pedagogical scientific text and a review of current research on the subject. It should be standing undoubtedly, next to the "Exact solution book", on the bookshelf of both graduate students and academic researchers working on general relativity."

Theophanes Grammenos, Mathematical Reviews

"... tell[s] of the achievements of a generation of theorists whose only instruments were, for a good part of their lives, a pad of paper and a few pencils."

Massimo Giovannini, CERN Courier

#### **About the Author**

Jerry Griffiths is a Professor at Loughborough University, where he has worked since obtaining his PhD from the University of Wales on neutrino fields in general relativity. He continues to work on the generation and interpretation of exact solutions of Einstein's equations and has published over 80 articles on these topics. Jiri Podolsky is an Associate Professor at Charles University in Prague, where he also obtained his PhD and Habilitation in theoretical physics. His research concentrates mainly on the investigation of exact radiative and black hole space-times in general relativity. He has published over 60 papers in these fields.

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