

1. Record Nr.	UNINA9910144603003321
Titolo	Analytical and numerical approaches to mathematical relativity // Jorg Frauendiener, Domenico J. W. Giulini, Volker Perlick (editors)
Pubbl/distr/stampa	Berlin ; ; Heidelberg : , : Springer, , [2006] ©2006
ISBN	1-280-61498-6 9786610614981 3-540-33484-X
Edizione	[1st ed. 2006.]
Descrizione fisica	1 online resource (XVII, 281 p.)
Collana	Lecture notes in physics ; ; Volume 692
Disciplina	530.110151
Soggetti	Mathematical physics Relativity (Physics) - Mathematics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Differential Geometry and Differential Topology -- A Personal Perspective on Global Lorentzian Geometry -- The Space of Null Geodesics (and a New Causal Boundary) -- Some Variational Problems in Semi-Riemannian Geometry -- On the Geometry of pp-Wave Type Spacetimes -- Analytical Methods and Differential Equations -- Concepts of Hyperbolicity and Relativistic Continuum Mechanics -- Elliptic Systems -- Mathematical Properties of Cosmological Models with Accelerated Expansion -- The Poincaré Structure and the Centre-of-Mass of Asymptotically Flat Spacetimes -- Numerical Methods -- Computer Simulation -- a Tool for Mathematical Relativity -- and Vice Versa -- On Boundary Conditions for the Einstein Equations -- Recent Analytical and Numerical Techniques Applied to the Einstein Equations -- Some Mathematical Problems in Numerical Relativity.
Sommario/riassunto	Today, general relativity rates among the most accurately tested fundamental theories in all of physics. However, deficiencies in our mathematical and conceptual understanding still exist, and these partly hamper further progress. For this reason alone, but no less important from the point of view that a theory-based prediction should be regarded as no better than one's own structural understanding of the

underlying theory, one should undertake serious investigations into the corresponding mathematical issues. This book contains a representative collection of surveys by experts in mathematical relativity writing about the current status of, and problems in, their fields. There are four contributions for each of the following mathematical areas: differential geometry and differential topology, analytical methods and differential equations, and numerical methods. This book addresses graduate students and specialist researchers alike.
