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	Autore	Landsman Klaas
	Titolo	Foundations of General Relativity : From Einstein to Black Holes
	Pubbl/distr/stampa	Nijmegen, : Radboud University Press, 2021
	Descrizione fisica	1 electronic resource (394 pages)
	Soggetti	Riemannian geometry
		Differential geometry
		Relativity physics
		History
		Mathematics
		Topology
	Lingua di pubblicazione	Inglese
	Formato	Materiale a stampa
	Livello bibliografico	Monografia
	Sommario/riassunto	This book, dedicated to Roger Penrose, is a second, mathematically oriented course in general relativity. It contains extensive references and occasional excursions in the history and philosophy of gravity, including a relatively lengthy historical introduction. The book is intended for all students of general relativity of any age and orientation who have a background including at least first courses in special and general relativity, differential geometry, and topology. The material is developed in such a way that through the last two chapters the reader may acquire a taste of the modern mathematical study of black holes initiated by Penrose, Hawking, and others, as further influenced by the initial-value or PDE approach to general relativity. Successful readers might be able to begin reading research papers on black holes, especially in mathematical physics and in the philosophy of physics. The chapters are: Historical introduction, General differential geometry, Metric differential geometry, Curvature, Geodesics and causal structure, The singularity theorems of Hawking and Penrose, The Einstein equations, The 3+1 split of space-time, Black holes I: Exact solutions, and Black holes II: General theory. These are followed by two

appendices containing background on Lie groups, Lie algebras, & constant curvature, and on Formal PDE theory.