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Nota di contenuto	1. Spinor geometry. 1.1. Minkowski space. 1.2. The null cone and Riemann sphere. 1.3. Spin transformations and spin matrices. 1.4. Flagpoles and flag planes. 1.5. Spin-space. 1.6. Exercises -- 2. Spinor algebra. 2.1. Abstract index notation. 2.2. Complex conjugation of spinor components. 2.3. Vector bases and abstract indices. 2.4. Levi-Civita spinor. 2.5. Spinor dyad basis and its components. 2.6. Spinor symmetry operations. 2.7. The connection between world-tensors and spinors. 2.8. The decomposition of spinors. 2.9. The canonical decomposition of symmetric spinors. 2.10. Exercises -- 3. Spinor analysis. 3.1. Spinor form of the covariant derivative. 3.2. The curvature spinors. 3.3. Spinor equivalent of the Ricci identities. 3.4. Spinor equivalent of the Bianchi identities. 3.5. The Newman-Penrose spin coefficient formalism. 3.6. Newman-Penrose quantities under Lorentz transformations. 3.7. Miscellaneous transformations. 3.8. Geroch-Held-Penrose formalism. 3.9. Goldberg-Sachs theorem. 3.10. Exercises -- 4. Lanczos spinor. 4.1. Introduction. 4.2. Lanczos' Lagrangian. 4.3. Lanczos' gauge conditions. 4.4. The Lanczos spinor. 4.5. The spinor version of the Weyl-Lanczos equations. 4.6. The Lanczos coefficients. 4.7. The Weyl-Lanczos equations in spin coefficient form. 4.8. The Ricci-Lanczos equations in spin coefficient form. 4.9. The behaviour of Lanczos coefficients under Lorentz transformations. 4.10.

Miscellaneous transformations. 4.11. The Weyl-Lanczos equations in GHP form. 4.12. Solutions of the Weyl-Lanczos equations. 4.13. A brief note on the Lanczos spinor/tensor. 4.14. Exercises.

Sommario/riassunto

This book deals with 2-spinors in general relativity, beginning by developing spinors in a geometrical way rather than using representation theory, which can be a little abstract. This gives the reader greater physical intuition into the way in which spinors behave. The book concentrates on the algebra and calculus of spinors connected with curved space-time. Many of the well-known tensor fields in general relativity are shown to have spinor counterparts. An analysis of the Lanczos spinor concludes the book, and some of the techniques so far encountered are applied to this. Exercises play an important role throughout and are given at the end of each chapter.