1. Record Nr. UNINA9910438124603321

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| Autore | Faraoni Valerio |
| Titolo | Special Relativity / / by Valerio Faraoni |
| Pubbl/distr/stampa | Cham : , : Springer International Publishing : , : Imprint : Springer, , 2013 |
| ISBN | 3-319-01107-3 |
| Edizione | [1st ed. 2013.] |
| Descrizione fisica | 1 online resource (316 p.) |
| Collana | Undergraduate Lecture Notes in Physics, , 2192-4791 |
| Disciplina | 530.11 |
| Soggetti | Gravitation<br>Mathematical physics<br>Classical and Quantum Gravitation, Relativity Theory<br>Mathematical Applications in the Physical Sciences |
| Lingua di pubblicazione | Inglese |
| Formato | Materiale a stampa |
| Livello bibliografico | Monografia |
| Note generali | Description based upon print version of record. |
| Nota di bibliografia | Includes bibliographical references and index. |
| Nota di contenuto | Fundamentals of Special Relativity -- Introduction -- The Principle of Relativity -- Groups—the Galilei group -- Galileian law of addition of velocities -- The lesson from electromagnetism -- The postulates of Special Relativity -- Consequences of the postulates -- Conclusion -- Problems -- The Lorentz transformation -- Introduction -- The Lorentz transformation -- Derivation of the Lorentz transformation -- Mathematical properties of the Lorentz transformation -- Absolute speed limit and causality -- Length contraction from the Lorentz transformation -- Time dilation from the Lorentz transformation -- Transformation of velocities and accelerations in Special Relativity -- Matrix representation of the Lorentz transformation -- The Lorentz group -- The Lorentz transformation as a rotation by an imaginary angle with imaginary time -- The GPS system -- Conclusion -- Problems -- The 4-dimensional world view -- Introduction -- The 4-dimensional world -- Spacetime diagrams -- Conclusion -- Problems -- The formalism of tensors -- Introduction -- Vectors and tensors -- Contravariant and covariant vectors -- Contravariant and covariant tensors -- Tensor algebra -- Tensor fields -- Index-free description of tensors -- The metric tensor -- The Levi-Civita symbol and tensor densities -- Conclusion -- Problems -- Tensors in Minkowski spacetime -- Introduction -- Vectors and tensors in Minkowski |

spacetime -- The Minkowski metric -- Scalar product and length of a vector in Minkowski spacetime -- Raising and lowering tensor indices -- Causal nature of 4-vectors -- Hypersurfaces -- Gauss' theorem -- Conclusion -- Problems -- Relativistic mechanics -- Introduction -- Relativistic dynamics of massive particles -- The relativistic force -- Angular momentum of a particle -- Particle systems -- Conservation of mass-energy -- Conclusion -- Problems -- Relativistic optics -- Introduction -- Relativistic optics: null rays -- The drag effect -- The Doppler effect -- Aberration -- Relativistic beaming -- Visual appearance of extended objects -- Conclusion -- Problems -- Measurements in Minkowski spacetime -- Introduction -- Energy of a particle measured by an observer -- Frequency measured by an observer -- A more systematic treatment of measurement -- The 3+1 splitting -- Conclusion -- Problems -- Matter in Minkowski spacetime -- Introduction -- The energy-momentum tensor -- Covariant conservation -- Energy conditions -- Angular momentum -- Perfect fluids -- The scalar field -- The electromagnetic field -- Conclusion -- Problems -- Special Relativity in arbitrary coordinates -- Introduction -- The covariant derivative -- Spacetime curves and covariant derivative -- Physics in Minkowski spacetime revisited -- Conclusions -- Problems -- Solutions to selected problems -- References -- Index.

Sommario/riassunto

This book offers an essential bridge between college-level introductions and advanced graduate-level books on special relativity. It begins at an elementary level, presenting and discussing the basic concepts normally covered in college-level works, including the Lorentz transformation. Subsequent chapters introduce the four-dimensional worldview implied by the Lorentz transformations, mixing time and space coordinates, before continuing on to the formalism of tensors, a topic usually avoided in lower-level courses. The book's second half addresses a number of essential points, including the concept of causality; the equivalence between mass and energy, including applications; relativistic optics; and measurements and matter in Minkowski spacetime. The closing chapters focus on the energy-momentum tensor of a continuous distribution of mass-energy and its covariant conservation; angular momentum; a discussion of the scalar field of perfect fluids and the Maxwell field; and general coordinates. Every chapter is supplemented by a section with numerous exercises, allowing readers to practice the theory. These exercises constitute an essential part of the textbook, and the solutions to approximately half of them are provided in the appendix.

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| Record Nr. | UNICAMPANIAVAN00298248 |
| Autore | König, Steffen |
| Titolo | Derived Equivalences for Group Rings / Steffen König, Alexander Zimmermann |
| Pubbl/distr/stampa | Berlin ; Heidelberg, : Springer, 1998 |
| Descrizione fisica | x, 246 p. ; 24 cm |
| Altri autori (Persone) | Zimmermann, Alexander |
| Soggetti | 16-XX - Associative rings and algebras [MSC 2020]<br>16D90 - Module categories in associative algebras; module theory in a category-theoretic context; Morita equivalence and duality [MSC 2020]<br>16E20 - Grothendieck groups, $K$-theory, etc. [MSC 2020]<br>16E40 - (Co)homology of rings and associative algebras(e.g. Hochschild, cyclic, dihedral, etc.) [MSC 2020]<br>16G10 - Representations of associative Artinian rings [MSC 2020]<br>16G30 - Representations of orders, lattices, algebras over commutative rings [MSC 2020]<br>16G70 - Auslander-Reiten sequences (almost split sequences) and Auslander-Reiten quivers [MSC 2020]<br>16H05 - Separable algebras (e.g., quaternion algebras, Azumaya algebras, etc.) [MSC 2020]<br>16S34 - Group rings, Laurent polynomial rings (associative algebraic aspects) [MSC 2020]<br>18-XX - Category theory; homological algebra [MSC 2020]<br>20-XX - Group theory and generalizations [MSC 2020]<br>20C05 - Group rings of finite groups and their modules (group-theoretic aspects) [MSC 2020]<br>20C20 - Modular representations and characters [MSC 2020] |
| Lingua di pubblicazione | Inglese |
| Formato | Materiale a stampa |
| Livello bibliografico | Monografia |