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Descrizione fisica	1 online resource (XVII, 609 p. 343 illus., 207 illus. in color.)
Collana	Undergraduate Texts in Physics, , 2510-411X
Disciplina	523.0197
Soggetti	Astrophysics Nuclear physics Cosmology Astrobiology Planetary science Astrophysics and Astroparticles Particle and Nuclear Physics Planetary Sciences
Lingua di pubblicazione	Inglese
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Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Historical Introduction -- The Standard Model of Elementary Particles -- Kinematics and Cross Sections -- Physics of Particle and Radiation Detection -- Acceleration Mechanisms -- Primary Cosmic Rays -- Secondary Cosmic Rays -- Cosmology -- The Early Universe -- Big Bang Nucleosynthesis -- The Cosmic Microwave Background -- Inflation -- Dark Matter -- Astrobiology -- Outlook -- Glossary -- Index.
Sommario/riassunto	This second, revised and thoroughly updated edition of the successful textbook by Claus Gruppen describes the branch of astrophysics known as astroparticle physics. Using experimental methods known from cosmic ray and particle physics, astroparticle physics investigates processes of highest energies taking place in the universe. The new edition reports on progress made by recent discoveries in gravitational wave astronomy and neutrino astronomy (including all details needed to understand recent discoveries in multi-messenger experiments) and also astrobiology. After a historical introduction to the basics of

elementary particles the author describes their interactions and the relevant detection techniques. The main body of the book concerns cosmic rays as well as particle processes in astrophysics and cosmology including the physics of the early universe. The book provides an orientation in the field of astroparticle physics that many beginners might be looking for. It also presents new sections exploring the interface between particle physics and cosmic radiation and illustrates the impact of particle physics discoveries to astroparticle physics. The physics is presented using little mathematics, and the results are illustrated by many diagrams and illustrative scientific cartoons which ease the reading of the book. Closing the gap between expert and popular level, the book is highly recommended for undergraduate students in physics or astronomy. It also includes an extensive glossary and a detailed index.
