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Nota di contenuto	Preface -- An Overview of Multimessenger Astrophysics -- Charged Cosmic Rays in our Galaxy -- Direct Cosmic Rays Detection: Protons, Nuclei, Electrons and Antimatter -- Indirect Cosmic Rays Detection: Particle Showers in the Atmosphere -- Diffusion of Cosmic Rays in the Galaxy -- Galactic Acceleration and Acceleration Mechanisms -- The Extragalactic Sources and Ultra High Energy Cosmic Rays -- The Sky Seen in -Rays -- The TeV Sky and Multiwavelength Astrophysics -- High-Energy Neutrino Astrophysics -- Atmospheric Muons and Neutrinos -- Low-Energy Neutrino Physics and Astrophysics -- Basics on the Observations of Gravitational Waves -- Microcosm and Macrocosm -- Conclusions -- Index.
Sommario/riassunto	"I have taught from and enjoyed the first edition of the book. The selection of topics is the best I've seen. Maurizio Spurio gives very clear presentations using a generous amount of observational data. " James Matthews (Louisiana State University) This is the second edition of an introduction to “multi-messenger” astrophysics. It covers the many different aspects connecting particle physics with astrophysics and cosmology and introduces high-energy astrophysics using different probes: the electromagnetic radiation, with techniques developed by

traditional astronomy; charged cosmic rays, gamma-rays and neutrinos, with methods developed in high-energy laboratories; and gravitational waves, recently observed using laser interferometers. The book offers a comprehensive and systematic approach to the theoretical background and the experimental aspects of the study of the high-energy universe. The breakthrough discovery of gravitational waves motivated this new edition of the book, to offer a more global and multimessenger vision of high-energy astrophysics. This second edition is updated and enriched with substantial new materials also deriving from the results obtained at the LIGO/Virgo observatories. For the first time it is now possible to draw the connection between gravitational waves, traditional astronomical observations and other probes (in particular, gamma-rays and neutrinos). The book draws on the extensive courses of Professor Maurizio Spurio at the University of Bologna and it is aimed at graduate students and post-graduate researchers with a basic understanding of particle and nuclear physics. It will also be of interest to particle physicists working in accelerator/collider physics who are keen to understand the mechanisms of the largest accelerators in the Universe. .