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Titolo	Solar Energetic Particles : A Modern Primer on Understanding Sources, Acceleration and Propagation / / by Donald V. Reames
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Descrizione fisica	1 online resource (XVI, 225 p. 124 illus., 103 illus. in color.)
Collana	Lecture Notes in Physics, , 0075-8450 ; ; 978
Disciplina	520
Soggetti	Astronomy Astrophysics Plasma (Ionized gases) Space sciences Atmospheric sciences Astronomy, Astrophysics and Cosmology Plasma Physics Space Sciences (including Extraterrestrial Physics, Space Exploration and Astronautics) Atmospheric Sciences
Lingua di pubblicazione	Inglese
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Nota di contenuto	Preface -- Introducing the Sun and SEPs -- A Turbulent History -- Distinguishing the Sources -- Impulsive SEP Events -- Gradual SEP Events -- High Energies and Radiation Effects -- Measurements of SEPs -- Elemental Abundances and FIP: SEPs, The Corona and the Solar Wind -- Hydrogen Abundances and Shock Waves -- Summary and Conclusions.
Sommario/riassunto	This open access book serves as a concise primer introducing the non-specialist reader to the physics of solar energetic particles (SEP). It systematically reviews the evidence for the two main mechanisms which lead to the so-called impulsive and gradual SEP events. This second edition contains two completely new chapters discussing element abundances and shock waves, reflecting new theoretical, modeling, and

observational results. Existing chapters have been substantially expanded or updated with additions placed in a broader context. More specifically, the author discusses the timing of the onsets of SEPs, their longitude distributions, their high-energy spectral shapes, their correlations with other solar phenomena, as well as the all-important elemental and isotopic abundances. The book relates impulsive SEP events to magnetic reconnection in solar flares and jets. The concept of shock acceleration by scattering on self-amplified Alfvén waves is introduced, as is the evidence of reacceleration of impulsive-SEP material in the seed population accessed by the shocks in gradual events. The text then develops processes of transport of ions out to an observer. Finally, a technique to determine the source plasma temperature in both impulsive and gradual events is demonstrated.The author also mentions the role of SEP events as a radiation hazard in space and briefly discusses the nature of the main particle telescope designs that have contributed to most of the SEP measurements.