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Titolo	Solar Energetic Particles [[electronic resource] ] : A Modern Primer on Understanding Sources, Acceleration and Propagation / / by Donald V. Reames
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Disciplina	536.7223
Soggetti	Space sciences Plasma (Ionized gases) Geophysics Observations, Astronomical Astronomy—Observations Space Sciences (including Extraterrestrial Physics, Space Exploration and Astronautics) Plasma Physics Geophysics/Geodesy Astronomy, Observations and Techniques
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	Introduction -- History -- Distinguishing Two Sources -- Impulsive SEP events -- Gradual SEP Events -- High Energies and Radiation Effects -- Measurements of SEPs -- Summary and Conclusions.
Sommario/riassunto	This concise primer introduces the non-specialist reader to the physics of solar energetic particles (SEP) and systematically reviews the evidence for the two main mechanisms which lead to the so-called impulsive and gradual SEP events. More specifically, the timing of the onsets, the longitude distributions, the high-energy spectral shapes, the correlations with other solar phenomena (e.g. coronal mass ejections), as well as the all-important elemental and isotopic abundances of SEPs are investigated. Impulsive SEP events are related 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 new technique to determine the source plasma temperature in both impulsive and gradual events is demonstrated. Last but not least the role of SEP events as a radiation hazard in space is mentioned and a short discussion of the nature of the main particle telescope designs that have contributed to most of the SEP measurements is given.

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