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Soggetti	Astrophysics Atoms Physics Magnetism Magnetic materials Astrophysics and Astroparticles Atoms and Molecules in Strong Fields, Laser Matter Interaction Magnetism, Magnetic Materials Applied and Technical Physics
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Nota di contenuto	Preface -- The Sun’s Magnetic Fields -- A Quick Look on Small-Scale Flux Tubes -- Intrinsic Properties of Flux Tubes – Wave Phenomena -- Effects of Flux Tube Inhomogeneities and Weak Nonlinearity -- Flux Tube Dynamics in the Presence of Mass Flows -- Collective Phenomena Ensembles of Flux Tubes -- Effects of Magnetic Flux Tubes in Helioseismology -- Wave Phenomena in Dense Conglomerate of Flux Tubes -- Nonlinear Wave Phenomena in Dense Conglomerate of Flux Tubes -- Magnetosonic Streaming -- Moving Magnetic Features (MMFs) -- Reconnection of Flux Tubes – Specifics of High Plasma -- Post-Reconnection Processes – Shocks, Jets and Microflares -- Photospheric Network as Energy Source for Quiet-Sun Corona -- Response of the Corona to Magnetic Activity in Underlying Plage Regions -- Electrodynamic Coupling of Active Region Corona with the Photosphere -- Fine Structure of Penumbrae: Formation and Dynamics -- Bow Shocks and Plasma Jetting over Penumbrae -- Selforganization in the

Corona and Flare Precursors -- Quiescent Prominences -- Laboratory Experiments Scaled to Solar and Space Plasmas -- What to Observe in Low Atmosphere -- What to Observe in the Upper Atmosphere -- Solutions.

Sommario/riassunto

This book presents the physics of magnetic flux tubes, including their fundamental properties and collective phenomena in an ensemble of flux tubes. The physics of magnetic flux tubes is vital for understanding fundamental processes in the solar atmosphere that are shaped and governed by magnetic fields. The concept of magnetic flux tubes is also central to various magnetized media ranging from laboratory plasma and Earth's magnetosphere to planetary, stellar and galactic environments. The book covers both theory and observations. Theoretical models presented in analytical and phenomenological forms that are tailored to practical applications. These are welded together with empirical data extending from the early pioneering observations to the most recent state-of-the-art data. This new edition of the book is updated and contains a significant amount of new material throughout as well as four new chapters and 48 problems with solutions. Most problems make use of original papers containing fundamental results. This way, the original paper, often based on complex theory, turns into a convenient tool for practical use and quantitative analysis.