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Autore	Nappi Eugenio
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Nota di contenuto	Imaging Gaseous Detectors and Their Applications; Contents; Preface; Color Plates; 1 Introduction; 1.1 Exploring the Universe by Detecting Photons and Particles; 1.2 Detectors of Photons and Charged Particles; 1.2.1 Vacuum Detectors; 1.2.2 Gaseous Detectors; 1.2.3 Liquid Detectors; 1.2.4 Solid-State Detectors; 1.2.5 Combination of Imaging Detectors with Scintillators; 1.2.6 Hybrid Imaging Detectors; 1.2.6.1 Vacuum Hybrid Detectors; 1.2.6.2 Gaseous Hybrid Detectors; 1.2.6.3 Liquid Hybrid Detectors; References; 2 Basic Processes in Gaseous Detectors 2.1 Interaction of Charged Particles and Photons with Matter 2.1.1 Ionization Energy Loss; 2.1.2 Interaction of Photons with Matter; 2.1.2.1 Interaction of Photons with Gases; 2.1.2.2 Interaction of Photons with Liquids; 2.1.2.3 Interaction of Photons with Metals and Other Solid Materials; 2.2 Drift of Electrons and Ions in Gases; 2.2.1 Drift of Electrons; 2.2.2 Drift of Ions; 2.3 Some remarks on the Diffusion; 2.3.1 Diffusion of Ions in Electric Fields; 2.3.2 Diffusion of Electrons in Electric Fields; 2.3.3 Drift and Diffusion of Electrons Moving in Electric and Magnetic Fields 2.4 Avalanche Multiplication in Gases References; 3 Traditional

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3.2.2 Streamer Chambers 3.3 Further Developments: Pulsed High frequency Detectors; References; 4 The Multi Wire Proportional Chamber Era; References; 5 More in Depth about Gaseous Detectors; 5.1 Pulse-Shape Formation in Gaseous Detectors in Absence of Secondary Effects; 5.1.1 Parallel-Plate Geometry; 5.1.2 Cylindrical Geometry; 5.1.3 MWPC Geometry; 5.2 Townsend Avalanches and Secondary Processes; 5.2.1 Role of Photon Emission; 5.2.1.1 Emission Spectra; 5.2.1.2 Photo effect on the Cathode; 5.2.1.3 Gas Photoionization; 5.2.2 Role of the Positive Ions
5.2.2.1 Ion Recombination on the Cathode in Vacuum 5.2.2.2 Recombination on the Cathode in Gas; 5.2.3 Role of Excited and Metastable Atoms; 5.3 Discharges in Gaseous Detectors; 5.3.1 Slow Breakdown; 5.3.2 Fast Breakdown; 5.3.3 Self-Quenched Streamers in Gas-Filled Wire Detectors; 5.4 Features of Operation of Wire Detectors at High Counting Rates; 5.5 After pulses and the Cathode-""Excitation"" Effect; References; 6 New Ideas on Gaseous Detectors Conceived during the Early Years of the ""Multi Wire Proportional Chambers"" Era (1968-1977); 6.1 Drift Chambers; 6.2 Time Projection Chamber
6.3 First Designs of Resistive-Plate Chambers

Sommario/riassunto

Describing advanced detectors and their visualization and investigation techniques, this book presents the major applications in nuclear and high-energy physics, astrophysics, medicine and radiation measurements.