

1. Record Nr.	UNINA9910813522903321
Autore	Sessler A. M (Andrew Marienhoff)
Titolo	Engines of discovery : a century of particle accelerators // Andrew Sessler, Edmund Wilson
Pubbl/distr/stampa	Hackensack, NJ, : World Scientific, c2007
ISBN	1-281-91184-4 9786611911843 981-277-190-5
Edizione	[1st ed.]
Descrizione fisica	1 online resource (212 p.)
Altri autori (Persone)	Wilson E. J. N (Edward J. N.)
Disciplina	539.7/3
Soggetti	Particle accelerators - Design and construction Particle accelerators
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references (p. 169-173) and index.
Nota di contenuto	Preface; Contents; Introduction; Chapter I. Electrostatic Accelerators; I.1 Scientific Motivation; I.2 Voltage Multiplying Columns; I.3 Silk Belts; I.4 Wisconsin Advances; I.5 Tandems; I.6 Commercial Production of Electrostatic Machines; I.7 Applications of Electrostatic Machines; Chapter II. Cyclotrons; II.1 The Anatomy of a Discovery; II.2 Lawrence and the Early Cyclotrons; II.3 Transverse Focusing; II.4 Relativistic Limitation; II.5 Calutrons; II.6 Cyclotrons for Peace Again; II.7 FFAG; II.8 Spiral Sector Cyclotrons; II.9 Modern Cyclotrons; II.10 Applications Chapter III. Linear Accelerators III.1 Science Motivation - An Idea in Search of a Technology; III.2 The Early Linear Accelerators at Berkeley; III.3 Proton Linacs; III.4 Electron Linacs; III.5 Heavy Ion Linacs - a Rich Field of Research; III.6 Induction Linacs; III.7 Applications of Induction Linacs; Chapter IV. Betatrons; IV.1 Early History; IV.2 The Kerst Betatron; IV.3 The Wideroe Betatron - Second Attempt; IV.4 The Years After World War II; Chapter V. Synchrotrons; V.1 Science Motivation; V.2 The Early History of the Synchrotron; V.3 First Synchrotron; V.4 Electron Synchrotrons V.5 Early Proton Synchrotrons V.6 Nimrod and Phasotron; V.7 Strong Focusing; V.8 Brookhaven's AGS and CERN's PS; V.9 Fermilab and SPS; V.10 Superconducting Magnets; Chapter VI. Colliders; VI.1 Science Motivation; VI.2 Principles; VI.3 Electron-Electron Colliders; VI.4

Electron-Positron Colliders; VI.5 Superconducting Cavities; VI.6 Proton-Proton Colliders; VI.7 Proton-Antiproton Colliders; VI.8 Asymmetric Collider Rings; VI.9 Large Hadron Collider (LHC); VI.10 Heavy-Ion Colliders; Chapter VII. Detectors; VII.1 Early Primitive Detectors VII.2 Scintillators, Photomultipliers and Cerenkov Counters VII.3 Collisions in Three Dimensions; VII.4 A Modern Detector; VII.5 Digital X-ray Imaging; VII.6 Detection Techniques for Synchrotron Radiation Sources; Chapter VIII. Synchrotron Radiation Sources; VIII.1 Scientific Motivation; VIII.2 Principles and Early History; VIII.3 Synchrotron Radiation; VIII.4 First Generation Synchrotron Sources; VIII.5 Second Generation Synchrotron Sources; VIII.6 Third Generation Synchrotron Sources; VIII.7 Angstrom Wavelength Free Electron Laser Facilities VIII.8 Future Fourth Generation Synchrotron Sources Chapter IX. Cancer Therapy Accelerators; IX.1 Cyclotrons; IX.2 Linacs; IX.3 Synchrotrons; IX.4 Other Therapies; IX.5 Future Facilities; Chapter X. Past, Present and Future; X.1 Future Needs; X.2 Linear Colliders and Their Origins; X.3 The International Linear Collider (ILC); X.4 The Compact Linear Collider (CLIC); X.5 Spallation Neutron Sources; X.6 Rare Isotope Accelerators; X.7 Neutrino Super Beams, Neutrino Factories and Muon Colliders; X.8 Accelerators for Heavy Ion Fusion and for Creating High Energy Density Plasmas
X.9 Proton Drivers for Power Reactors

Sommario/riassunto

This book for the first time chronicles the development of particle accelerators from the invention of electrostatic accelerators, linear accelerators, and the cyclotron to the colliders of today. It also addresses accelerators employed as sources of x-rays, for medical purposes, and in industrial applications. The book identifies the crucial discoveries in applied physics and engineering that have driven the field and gives the reader insight into the people who made these discoveries as well as the methods they used. Particle accelerators exploit every aspect of today's cutting edge technology
