Record Nr. UNINA9910493743103321 Challenges and goals for accelerators in the XXI century / / editors, **Titolo** Oliver Bruning, Stephen Myers Pubbl/distr/stampa Hackensack, New Jersey:,: World Scientific,, 2016 ©2016 **ISBN** 981-4436-40-2 Descrizione fisica 1 online resource (855 p.) Disciplina 539.7/3 Soggetti Particle accelerators Colliders (Nuclear physics) 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 at the end of each chapters. Nota di contenuto Contents; Foreword; Part 1: Introduction; Chapter 1. Particle accelerators and the progress of particle physics; 1 The Standard Model of fundamental interactions; 2 Accelerators, and the experimental path towards the standard model; 2.1 The gauge bosons sector of the SM; 2.2 The fermionic sector of the SM; 2.3 The flavour structure of the SM; 2.4 The dynamics of the SM; 3 Complementarity and synergy of different accelerator facilities; 4 The future challenges; Chapter 2. Energy revolution: From static fields to cavity resonators; 1 Introduction; 2 Particle acceleration; 2.1 Lorentz force 2.2 Maxwell equations and vector and scalar potentials 3 Electrostatic accelerators; 3.1 High voltage acceleration columns; 3.2 Cockcroft and Walton rectifier circuit; 3.3 Van de Graaff generator; 3.4 The Tandem Generator; 4 Particle acceleration using time varying voltage generators; 4.1 Drift tube linear accelerator; 4.2 The Cyclotron; 4.3 The Betatron; 5 Particle acceleration using electromagnetic waves; 5.1

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"The past 100 years of accelerator-based research have led the field from first insights into the structure of atoms to the development and confirmation of the Standard Model of physics. Accelerators have been a key tool in developing our understanding of the elementary particles and the forces that govern their interactions. This book describes the past 100 years of accelerator development with a special focus on the technological advancements in the field, the connection of the various accelerator projects to key developments and discoveries in the Standard Model, how accelerator technologies open the door to other applications in medicine and industry, and finally presents an outlook of future accelerator projects for the coming decades."--Provided by publisher.