

Contents

Preface IX

List of Contributors XI

Part A: Fundamental Nuclear Research 1

- 1 **Nuclear Structure** 3
Jan Jolie
- 2 **Nuclear Reactions** 45
Carlos A. Bertulani
- 3 **Electrostatic Accelerators** 93
David C. Weissner
- 4 **Linear Accelerators** 123
Robert Jameson, Joseph Bisognano, and Pierre Lapostolle
- 5 **Exotic Nuclear Beam Facilities** 159
Hans Geissel, Mark Huyse, Gottfried Münzenberg, and Piet Van Duppen
- 6 **Superheavy Nuclei** 213
Sigurd Hofmann
- 7 **Nuclear γ -Spectroscopy and the γ -Spheres** 247
Mark Riley and John Simpson
- 8 **γ Optics and Nuclear Photonics** 271
Dietrich Habs
- 9 **The Proton** 299
Allen Caldwell
- 10 **Physics of the Neutron** 321
Klaus Schreckenbach

11	Neutrino Astrophysics 353 <i>Wick C. Haxton</i>
12	Nuclear Astrophysics 395 <i>Hendrik Schatz</i>
13	Relativistic Nucleus–Nucleus Collisions 427 <i>Christoph Blume</i>
	Part B: Applied Nuclear Physics 451
14	Neutron Stars 453 <i>Jürgen Schaffner-Bielich</i>
15	Supernovae and Their Nucleosynthesis 475 <i>Friedrich-Karl Thielemann and Matthias Liebendörfer</i>
16	Accelerator Mass Spectrometry and its Applications 503 <i>Ragnar Hellborg, Göran Skog, and Kristina Stenström</i>
17	Nuclear Medicine 535 <i>Ulli Köster, Ferid Haddad, Nicolas Chouin, François Davodeau, Jean-François Chatal, Jacques Barbet, and Françoise Kraeber-Bodéré</i>
18	Cancer Therapy with Ion Beams 577 <i>Gerhard Kraft</i>
	Part C: Nuclear Power 597
19	The Physics of Nuclear Power from Fission and Fusion 599 <i>Weston M. Stacey</i>
20	Fundamentals of Controlled Nuclear Fission and Essential Characteristics of Pressurized-Water Reactors 631 <i>Hartmut Lauer</i>
21	Generation IV Nuclear Reactors 663 <i>Thomas Schulenberg</i>
22	Transmutation of High-Level Nuclear Waste by Means of Accelerator Driven System (ADS) 689 <i>Hamid Aït Abderrahim, Didier De Bruyn, Gert Van den Eynde, and Sidney Michiels</i>
23	Fusion Energy by Magnetic Confinement 705 <i>Friedrich Wagner</i>

24	Heavy Ion Inertial Fusion	743
	<i>Rudolf Bock and Ingo Hofmann</i>	
	Index	761

