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Nota di contenuto	Cover; X-Rays and Materials; Title Page; Copyright Page; Table of Contents; Preface; Chapter 1. Synchrotron Radiation: Instrumentation in Condensed Matter; 1.1. Introduction; 1.2. Light sources in the storage ring; 1.2.1. Bending magnets; 1.2.2. Insertion devices; 1.2.2.1. Wigglers; 1.2.2.2. Undulators; 1.3. Emittance and brilliance of a source; 1.4. X-ray diffraction with synchrotron radiation; 1.4.1. Angle-dispersive diffraction; 1.4.2. Energy dispersive diffraction; 1.5. X-ray absorption spectroscopy using synchrotron radiation; 1.5.1. X-ray absorption spectroscopy 1.5.2. Energy-scanned X-ray absorption spectroscopy1.5.3. Energy dispersive X-ray absorption spectroscopy; 1.6. SAMBA: the X-ray absorption spectroscopy beam line of SOLEIL for 4-40 keV; 1.7. The DIFFABS beam line; 1.7.1. Description of the beam line; 1.7.2. Examples of use of the DIFFABS beam line; 1.8. CRISTAL beam line; 1.8.1. Beam line optics; 1.8.2. Diffractometers; 1.8.3. Sample environments; 1.9. The SOLEIL ODE line for dispersive EXAFS; 1.9.1. Optics of the ODE line;

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 1.10. Conclusion; 1.11. Bibliography; Chapter 2. Nanoparticle Characterization using Central X-ray Diffraction; 2.1. Introduction; 2.2. Definition of scattered intensity; 2.3. Invariance principle; 2.3.1. General case; 2.3.2. Isotropic systems; 2.3.3. Multi-level systems; 2.4. Behavior for large  $q$ : the Porod regime; 2.5. Particle-based systems; 2.5.1. Definition of form factor; 2.5.2. Introduction to the structure factor; 2.5.3. Intensity behavior at small  $q$ : the Guinier regime; 2.5.4. Volume measurements  
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## Sommario/riassunto

This book presents reviews of various aspects of radiation/matter interactions, be these instrumental developments, the application of the study of the interaction of X-rays and materials to a particular scientific field, or specific methodological approaches. The overall aim of the book is to provide reference summaries for a range of specific subject areas within a pedagogical framework. Each chapter is written by an author who is well known within their field and who has delivered an invited lecture on their subject area as part of the "RX2009 - X-rays and Materials" colloqui