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Altri autori (Persone)	ShenderovaOlga A GruenDieter M
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Nota di contenuto	Front Cover; Ultrananocrystalline Diamond: Synthesis, Properties, and Applications; Copyright Page; Contents; Contributors; Preface; PART 1: OVERVIEW: NATURALLY OCCURRING UNCD AND ITS LABORATORY SYNTHESIS; Chapter 1. Carbon Family at the Nanoscale; Introduction; 1.1 Historical Overview; 1.2 Nanocarbon Classification; 1.3 Exotic Nanocarbons; 1.4 Conclusion; References; Chapter 2. Extraterrestrial Nanodiamonds in the Cosmos; Introduction; 2.1 Stellar Nucleosynthesis and Presolar Stardust; 2.2 Discovery and Identification of Presolar Minerals; 2.3 Origins of Meteoritic Nanodiamonds 2.4 Isotopic Compositions of Meteoritic Nanodiamonds: Stellar Sources2.5 Microstructure of Meteoritic Nanodiamonds: Formation Mechanisms; 2.6 Noble Gas and N Content in Meteoritic Nanodiamonds: Nebular Processes; 2.7 Nanodiamonds in Interplanetary Dust Particles: Insights on Solar Nebula Evolution; 2.8 Summary of Experimental Data; 2.9 The New Astronomy; Acknowledgments; References; Chapter 3. Types of Nanocrystalline Diamond; Introduction; 3.1 Nanodiamonds: Shapes; 3.2 Types of Nanodiamond and Methods of Their Synthesis; 3.3 Conclusion; Acknowledgments; References PART 2: STABILITY OF NANODIAMONDChapter 4. Stability of Nanodiamond; Introduction: Nanocarbon Phase Stability; 4.1 Nanocarbon Phase Diagrams; 4.2 Theoretical Studies of the Relative Phase Stability of Nanocarbons; 4.3 Morphologies; 4.4 Conclusions; Acknowledgments; References; PART 3: UNCD FILMS AND RELATED MATERIALS; Chapter 5. Electron Transport and the Potential of Ultrananocrystalline Diamond as a Thermoelectric Material; Introduction; 5.1 Characterization of n-type Conductivity in UNCD Films; 5.2 Applications of n-type UNCD Films; 5.3 Electronic Structure of UNCD Grain Boundaries 5.4 UNCD and Carbon Nanotube/UNCD Composites as Potential High-Efficiency, High-Temperature Thermoelectric Materials5.5 Summary; Acknowledgments; References; Chapter 6. Plasma-Assisted Synthesis: Plasma Experimental Diagnostics and Modeling; Introduction; 6.1 Experimental Details; 6.2 Fundamentals of Plasma Diagnostics; 6.3 Investigations of Typical NCD Deposition Conditions; 6.4 Investigations of Ar/H2/CH4 Microwave Discharges with the Plasma Thermochemical Model; 6.5 General Conclusion; References Chapter 7. Nanodiamond Films Deposited from Energetic Species: Material Characterization and Mechanism of FormationIntroduction; 7.1 The Deposition System and Deposition Parameters; 7.2 Evolution and Properties of the Films Studied by NEXAFS: Coordination and Orientation; 7.3 Phase Composition of the Films as Reflected by Raman Spectroscopy; 7.4 Crystalline Structure of the Films by XRD; 7.5 Morphological Evolution of the Films by AFM; 7.6 Surface and Grain Boundary Phase Composition Studied by EELS; 7.7 Hydrogen Content in the Films by SIMS and ERD 7.8 Hydrogen Bonding Configuration in the Nanodiamond Films Studied by HREELS
Sommario/riassunto	Ultrananocrystalline Diamond: Syntheses, Properties, and Applications is a unique practical reference handbook that brings together the basic science of nanoscale carbon structures, particularly its diamond phase, with detailed information on nanodiamond synthesis, properties, and applications. Here you will learn about UNCD in its two forms, as a dispersed powder made by detonation techniques and as a chemical

vapor deposited film. You will also learn about the superior mechanical, tribological, transport, electrochemical, and electron emission properties of UNCD for a wide range of applicati