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Nota di contenuto	Plasma-Aided Nanofabrication; Contents; Preface; 1 Introduction; 1.1 What is a Plasma?; 1.2 Relevant Issues of Nanoscience and Nanotechnology; 1.3 Plasma-Assisted Synthesis of Nanomaterials; 1.4 How to Choose the Right Plasma for Applications in Nanotechnology?; 1.5 Structure of the Monograph and Advice to the Reader; 2 Generation of Highly Uniform, High-Density Inductively Coupled Plasma; 2.1 Low-Frequency ICP with a Flat External Spiral Coil: Plasma Source and Diagnostic Equipment; 2.1.1 Plasma Source; 2.1.2 Diagnostics of Inductively Coupled Plasmas 3 Plasma Sources: Meeting the Demands of Nanotechnology3.1 Inductively Coupled Plasma Source with Internal Oscillating Currents: Concept and Experimental Verification; 3.1.1 Configuration of the

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3.4 Integrated Plasma-Aided Nanofabrication Facility3.5 Concluding Remarks; 4 Carbon-Based Nanostructures; 4.1 Growth of Carbon Nanostructures on Unheated Substrates; 4.1.1 Process Details; 4.1.2 Synthesis, Characterization, and Growth Kinetics; 4.2 Temperature-Controlled Regime; 4.3 Single-Crystalline Carbon Nanotips: Experiment; 4.4 Single-Crystalline Carbon Nanotips: ab initio Simulations; 4.4.1 Theoretical Background and Numerical Code; 4.4.2 Geometrical Stability of Carbon Nanotip Structures; 4.4.3 Electronic Properties of Carbon Nanotips
4.5 Plasma-Assisted Doping and Functionalization of Carbon Nanostructures4.5.1 Doping of Carbon-Based Nanostructures: Density Functional Theory Considerations; 4.5.2 Postprocessing of Carbon-Based Nanostructures: Experiments; 4.6 Synthesis of Carbon Nanowall-Like Structures; 5 Quantum Confinement Structures; 5.1 Plasma-Assisted Fabrication of AlN Quantum Dots; 5.2 Nanofabrication of Al(x) In(1-x)N Quantum Dots: Plasma-Aided Bandgap Control; 5.3 Plasma-Aided Nanofabrication of SiC Quantum Dot Arrays; 5.3.1 SiC Properties and Applications; 5.3.2 SiC Growth Modes: With and Without AlN Interlayer
5.3.3 Quest for Crystallinity and Nanopattern Uniformity

Sommario/riassunto

In this single work to cover the use of plasma as nanofabrication tool in sufficient depth internationally renowned authors with much experience in this important method of nanofabrication look at reactive plasma as a nanofabrication tool, plasma production and development of plasma sources, as well as such applications as carbon-based nanostructures, low-dimensional quantum confinement structures and hydroxyapatite bioceramics. Written principally for solid state physicists and chemists, materials scientists, and plasma physicists, the book concludes with the outlook for such applications.