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Nota di contenuto	1. Introductory Chapter: Large Eddy Simulation for Turbulence Modeling -- 2. An Effective H2-LU Preconditioner for Iterative Solution of MQS Integral-Based Formulation P -- 3. Large Scale Simulations for Dust Acoustic Waves in Weakly Coupled Dusty Plasmas -- 4. Future Particle Accelerators -- 5. Faster Fusion Power from Spherical Tokamaks with High-Temperature Superconductors -- 6. Some Research Method about Superconducting Magnet Systems of TOKAMAK -- 7. Main Challenges of Heating Plasma with Waves at the Ion Cyclotron Resonance Frequency (ICRF) -- 8. Charged Particle Beam Injection into Magnetically Confined Plasmas -- 9. Decoupling Techniques for Coupled PDE Models in Fluid Dynamics.
Sommario/riassunto	Fusion power may offer a long-term energy supply with an uninterrupted power delivery, a high power-generation density, and no greenhouse gas emissions, contributing to preventing the worst effects of climate change and making an enduring contribution to future energy supply. However, the intense conditions inside a fusion power plant (extreme temperatures and high magnetic fields necessary for nuclear fusion) call for addressing several potential problems. These include the development of new materials with extremely high heat tolerances and low enough vapor pressure and the design of mechanical structures that can withstand the electromagnetic force generated as well as feedback controllers to measure and counteract the unstable modes of evolution of the plasma, to name a few. The

future of nuclear fusion as an efficient alternative energy source depends largely on techniques that enable us to control these instabilities. Mathematical modelling and physical experiments attempt to overcome some of the hindrances posed by these complexities. This book provides a comprehensive overview of the current state of the art in this fascinating and critically important field of pure and applied physics, mathematics, and engineering, presenting some of the most recent developments in theory, modelling, algorithms, experiments, and applications.