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Sommario/riassunto	Many objects of physical, biological, and industrial interest include randomly distributed nanoscale nonuniformities, e.g., nanoparticles. Their characterization online in dynamic industrial processes and in situ in biological systems faces serious practical challenges when the rapid formation and distribution of nanoparticles takes place. This book discusses optical sensing techniques - the best tools for nanoparticle monitoring, as they are fast, non-invasive, and provide a broad range of information in real time. It provides a theoretical model for the relation between observed signals and studied system properties. The application of these methods enables the analysis of particle suspensions, colloidal dispersions, and polymer solutions leading to new medical diagnostics and therapies.