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Nota di contenuto	Introduction -- Correlation Force Spectroscopy -- Dynamics of Single Molecules -- Microrheology with Correlation Force Spectroscopy -- Development of Colloidal Probe Correlation Force Spectroscopy: Case Study -- Correlation Force Spectroscopy for Single Molecule Measurements -- Single Molecule Force Spectroscopy of Dextran -- Single Molecule Force Spectroscopy of Single-Stranded DNA -- Summary.
Sommario/riassunto	This thesis addresses the development of a new force spectroscopy tool, correlation force spectroscopy (CFS) for the measurement of the properties of very small volumes of material (molecular to μm3) at

kHz-MHz frequency range. CFS measures the simultaneous thermal fluctuations of two closely-spaced atomic force microscopy (AFM) cantilevers. CFS then calculates the cross-correlation in the thermal fluctuations that gives the mechanical properties of the matter that spans the gap of the two cantilevers. The book also discusses development of CFS, its advantages over AFM, and its application in single molecule force spectroscopy and micro-rheology.