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Autore	IAkushevich L. V (Liudmila Vladimirovna)
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	 2.6.2 Transverse Displacements in Strands2.7 Approximate Models of DNA Dynamics; 2.7.1 The Main Principles of Modeling; 2.7.2 Hierarchy of Dynamical Models; 2.8 Experimental Methods for Studying DNA Dynamics; 2.8.1 Raman Scattering; 2.8.2 Neutron Scattering; 2.8.3 Infrared Spectroscopy; 2.8.4 Hydrogen-Deuterium (-Tritium) Exchange; 2.8.5 Microwave Absorption; 2.8.6 NMR; 2.8.7 Charge-transfer Experiments; 2.8.8 Single Molecule Experiments; 3 DNA Function; 3.1 Physical Aspects of DNA Function; 3.2 Intercalation; 3.3 DNA-Protein Recognition; 3.4 Gene Expression; 3.5 Regulation of Gene Expression 3.6 Replication4 Linear Theory of DNA; 4.1 The Main Mathematical Models; 4.1.1 Linear Rod-like Model; 4.1.1.1 Longitudinal and Torsional Dynamics: Discrete Case; 4.1.1.2 Longitudinal and Torsional Dynamics: Continuous Case; 4.1.3 Bending Motions; 4.1.2 Linear Double Rod-like Model; 4.1.2.1 Discrete Case; 4.1.2.2 Continuous Case; 4.1.3 Linear Models of Higher Levels; 4.1.3.1 The Third-Level Models; 4.1.3.2 The Fourth-level (Lattice) Models; 4.2 Statistics of Linear Excitations; 4.2.1 Phonons in the Rod-like Model; 4.2.1.1 General Solution of the Model Equations 4.2.1.2 Secondary Quantum Representation4.2.1.3 Correlation Functions; 4.2.2 Phonons in the Double Rod-like Model; 4.2.2.1 General Solution of the Model Equations; 4.2.3 Phonons in the Higher-level Models; 4.3.3 Cartering Problem; 4.3.1 Scattering by 'Frozen' DNA; 4.3.2 Elastic Scattering; 4.3.3 Inelastic Scattering; 4.4 Linear Theory and Experiment; 4.4.1 Fluorescence Depolarization; 4.4.2 Low-frequency Spectra: Neutron Scattering, Infrared scattering, Raman Scattering, Speed of Sound 5 Nonlinear Theory of DNA: Ideal Dynamical Models
Sommario/riassunto	The first edition of this book was the first on the physics of DNA to go beyond the simple (simplified) 'linear' approach, and it has since been found that the inclusion of nonlinear effects leads to a significantly improved interpretation of experimental data. This new edition naturally retains this approach, but has been completely revised, updated and expanded to cover recent developments.Beginning with introductory chapters on DNA structure and dynamics, the book also includes a comparison between linear and nonlinear approaches to the DNA molecule, a chapter devoted to the statistics