

Contents

1	Introduction	1
	Andrey V. Solov'yov	
2	Atomic and Molecular Physics Methods for Nanosystems	15
	Alexey V. Verkhovtsev and Andrey V. Solov'yov	
3	Multiscale Computational Modelling of MesoBioNano Systems	95
	Gennady B. Sushko, Ilia A. Solov'yov, and Andrey V. Solov'yov	
4	Structure and Dynamics of Bio- and Macromolecules	137
	Alexey V. Verkhovtsev, Ilia A. Solov'yov, and Andrey V. Solov'yov	
5	Quantum Effects in Biological Systems	201
	Anders Frederiksen, Thomas Teusch, and Ilia A. Solov'yov	
6	Dynamics and Phase Transitions in Nanosystems	249
	Alexey V. Verkhovtsev and Andrey V. Solov'yov	
7	Multiscale Modeling of Surface Deposition Processes	307
	Ilia A. Solov'yov and Andrey V. Solov'yov	
8	Multiscale Modeling of Irradiation-Driven Chemistry Processes	347
	Gennady Sushko, Alexey V. Verkhovtsev, Ilia A. Solov'yov, and Andrey V. Solov'yov	
9	Multiscale Approach for the Physics of Ion Beam Cancer Therapy	389
	Eugene Surdutovich, Alexey V. Verkhovtsev, and Andrey V. Solov'yov	

10 Novel Light Sources Beyond FELs 459
Andrei V. Korol and Andrey V. Solov'yov

11 Conclusions and Outlook 539
Andrey V. Solov'yov