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Sommario/riassunto	This book develops a methodology for the real-time coupled quantum dynamics of electrons and phonons in nanostructures, both isolated structures and those open to an environment. It then applies this technique to both fundamental and practical problems that are relevant, in particular, to nanodevice physics, laser–matter interaction, and radiation damage in living tissue. The interaction between electrons and atomic vibrations (phonons) is an example of how a

process at the heart of quantum dynamics can impact our everyday lives. This is e.g. how electrical current generates heat, making your toaster work. It is also a key process behind many crucial problems down to the atomic and molecular scale, such as the functionality of nanoscale electronic devices, the relaxation of photo-excited systems, the energetics of systems under irradiation, and thermoelectric effects. Electron–phonon interactions represent a difficult many-body problem. Fairly standard techniques are available for tackling cases in which one of the two subsystems can be treated as a steady-state bath for the other, but determining the simultaneous coupled dynamics of the two poses a real challenge. This book tackles precisely this problem.