



Physics of Low-Dimensional Structures: From Quantum Wells to DNA and Artificial Atoms

By Georgios P. Triberis

Nova Science Publishers Inc. Hardback. Book Condition: new. BRAND NEW, Physics of Low-Dimensional Structures: From Quantum Wells to DNA and Artificial Atoms, Georgios P. Triberis, This book covers the field of low dimensional structures, starting from the selectively doped double heterostructures n-AlGaAs/GaAs/n-AlGaAs, and (strained) p-Si/SiGe/p-Si (quantum wells). The behaviour of the sheet electron density, the subband populations and energies as a function of the well width, the spacer thickness and the doping concentration is analysed. The temperature dependence of the bulk electron concentration versus the quasi-2DEG are discussed. In the framework of Boltzmann's transport theory, a detailed study of the mobility is presented at low and high temperatures, taking into account all the relevant scattering mechanisms. The pseudomorphic Si/SiGe undoped quantum wells are a perfect example for the study of the non-parabolicity of the hole-bands. For the first time in a book, an exact solution of the multiband effective mass equation that describes the heavy, light and split-off hole valence bands is introduced, and interband transitions and selection rules are obtained. Reducing dimensionality, new aspects concerning optical and transport properties of quantum wires (QWRs) is discussed. Specifically, the photoluminescence and the microphotoluminescence spectra of V-shaped QWRs is theoretically interpreted leading...



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