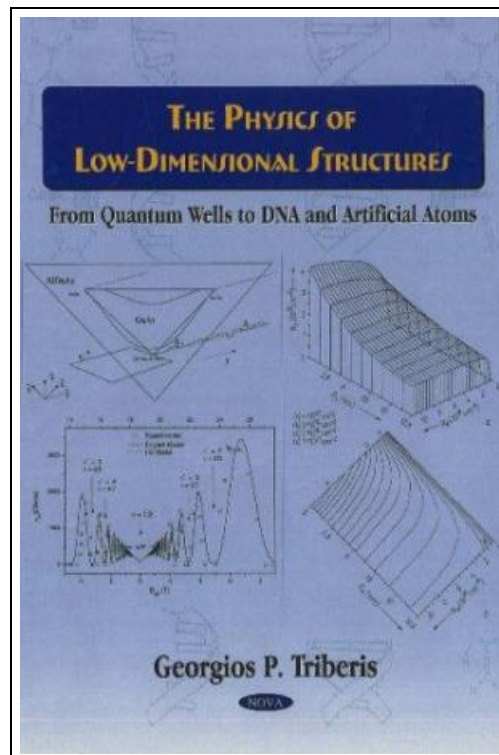


# Physics of Low-Dimensional Structures: From Quantum Wells to DNA and Artificial Atoms



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## **Reviews**

*This is the very best publication we have read through right up until now. It is one of the most incredible book we have read through. Once you begin to read the book, it is extremely difficult to leave it before concluding.*

*(Miss Celia Volkman)*

## PHYSICS OF LOW-DIMENSIONAL STRUCTURES: FROM QUANTUM WELLS TO DNA AND ARTIFICIAL ATOMS



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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 to a realistic cartography of the interface roughness of these systems. A computational approach for the solution of the eigenvalue problem in low-dimensional systems of complex but realistic geometry is also presented for the first time in a book, and transport theoretical considerations will lead to a systematic study of the mobility. As DNA could be considered as a one-dimensional "molecular wire" the study of carrier transport along DNA is discussed in terms of hopping transport. A computational scheme is presented, which allows the study of near-field magnetoabsorption spectra of Quantum Dots (QD) of any given geometry, under magnetic field...



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