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The wonder of nanotechnology: Quantum optoelectronic devices and applications

Manijeh Razeghi, Leo Esaki, Klaus von Klitzing

Electrical Engineering and Computer Science

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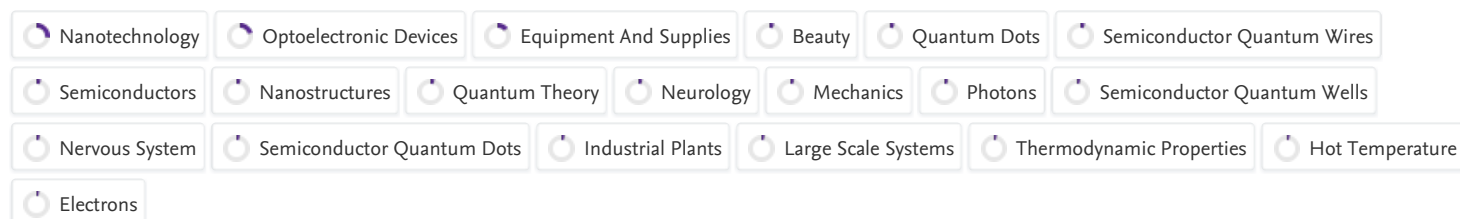
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Abstract

When you look closely, Nature is nanotechnology at its finest. From a single cell, a factory all by itself, to complex systems, such as the nervous system or the human eye, each is composed of specialized nanostructures that exist to perform a specific function. This same beauty can be mirrored when we interact with the tiny physical world that is the realm of quantum mechanics. The Wonder of Nanotechnology: Quantum Optoelectronic Devices and Applications, edited by Manijeh Razeghi, Leo Esaki, and Klaus von Klitzing focuses on the application of nanotechnology to modern semiconductor optoelectronic devices. Electrons, photons, and even thermal properties can all be engineered at the nanolevel. The 2D quantum well, possibly the simplest aspect of nanotechnology, has dramatically enhanced the efficiency and versatility of electronic and optoelectronic devices. While this area alone is fascinating, nanotechnology has now progressed to 1D (quantum wire) and 0D (quantum dot) systems that exhibit remarkable and sometimes unexpected behaviors. With these components serving as the modern engineer's building blocks, it is a brave new world we live in, with endless possibilities for new technology and scientific discovery.

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