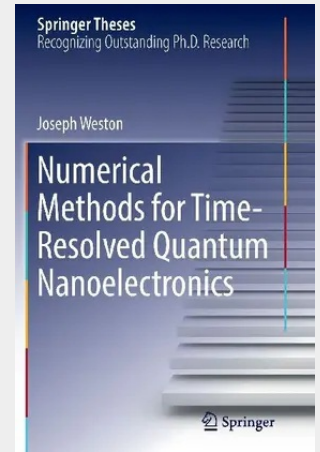


Weston

Numerical Methods for Time-Resolved Quantum Nanoelectronics

This thesis develops novel numerical techniques for simulating quantum transport in the time domain and applies them to pertinent physical systems such as flying qubits in electronic interferometers and superconductor/semiconductor junctions hosting Majorana bound states (the key ingredient for topological quantum computing). In addition to exploring the rich new physics brought about by time dependence, the thesis also develops software that can be used to simulate nanoelectronic systems with arbitrary geometry and time dependence, offering a veritable toolbox for exploring this rapidly growing domain.

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