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Research Area:

Nanoscale Electronics / Single-electron transport in quantum-dot arrays

The research is focused on simulations of single-electron transport in one- and two-dimensional arrays of quantum dots. The goals of this research include understanding the physical conditions necessary to realize high-contrast non-linear features in the current through an array as a function of the applied potential difference. Nonlinear current-voltage relations are the result of Coulomb-blockade and Coulomb-staircase phenomena in the electrical charging of nanoscale electrical conductors. Applications include the development of pattern classification algorithms modeled after neuromorphic networks.

Research Mentor:

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