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JOHN J. HOPFIELD

Citation:

John J. Hopfield has made important contributions in an impressively broad spectra of scientific subjects. His special and rare gift is his ability to cross the inter-disciplinary boundary to discover new questions and propose answers that uncover the conceptual structure behind the experimental facts. His early research on the Light Emitting Diodes has been recognised with the Buckley Prize. In Biology he understood the need for and proposed the principle ("proof-reading") by which the replication mechanism manages to achieve accuracy far beyond the possible in equilibrium processes. The famous Hopfield model of neural processing demonstrated by construction how qualitatively different computation in a computer and in the brain could be. More recently, he has found an entirely different organising principle in olfaction and demonstrated a new principle in which neural function can take advantage of the temporal structure of the "spiking" interneural communication.