

Plenary Talk in Applied Mathematics and Mathematical Physics

Quantum engineering: taming the Schrödinger cat

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Behind the hype of nanotechnologies and quantum computing, there is very real and very solid progress in our understanding of quantum physics of small artificial devices, and our ability to design, fabricate and manipulate them in the quantum regime. In particular, this applies to the structures based on superconducting qubits, where coherent superpositions of macroscopically distinct states (which involve up to 10^5 – 10^6 single-particle states per qubit, like in flux qubits) are realized. The research in this field, not limited to quantum computing, will bring us both true understanding of the quantum-classical transition and the ability to control and use it.