Plenary Talk PV VIII Thu 9:45 Paulussaal

Continuous Frontiers for Quantum Measurements — •Birgitta Whaley — University of California, Berkeley

Quantum measurements are an essential component of quantum information science and technology but are often presented only within discrete formulations. Continuous weak measurements provide a versatile framework for monitoring quantum systems that can be integrated with feedback onto both unitary and dissipative measurement controls, allowing for a broad range of applications to key quantum information tasks. I shall describe examples of such control to superconducting qubit platforms where this enables high fidelity generation of large-scale entangled states, continuous quantum error correction, implementation of quantum gates and quantum state steering ('dragging') by continuously implemented quantum Zeno dynamics and realizing controlled non-Hermitian quantum dynamics.