Departamento de
Física de la
Materia Condensada
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High-Kinetic Inductance Technology for Quantum Devices

High-kinetic-inductance superconducting circuits provide a versatile platform for engineering compact quantum devices with enhanced light–matter interactions. In hybrid semiconductor–superconductor architectures, high-impedance resonators can mediate long-distance coupling between quantum dots, overcoming the short-range nature of spin-qubit interactions. We recently demonstrated strong charge–photon coupling in Ge quantum dots, reaching a vacuum Rabi splittings up to 260 MHz and cooperativity near 100. Beyond qubit architectures, the ultracompact footprint of high-kinetic-inductance resonators enables low-disorder coupled cavity arrays and photonic metamaterials with engineered band structures, topological edge states, and superstrong multimode coupling to “giant” artificial atoms.

Pasquale Scarlino is Tenure Track Assistant Professor at EPFL, where he leads the Hybrid Quantum Circuits group. His research focuses on hybrid semiconductor–superconductor quantum devices, combining spin and charge qubits in quantum dots with high-impedance superconducting resonators and circuit-QED architectures. His group develops high-kinetic-inductance technologies for quantum information processing, microwave photonics, and quantum-limited amplification. Before joining EPFL, he contributed to pioneering experiments on semiconductor spin qubits and coherent microwave interfaces between semiconductor and superconducting quantum systems. His work aims to realize scalable hybrid quantum architectures for next-generation quantum technologies.

Con la colaboración de:

Facultad de Ciencias
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18 junio

HORA: 12:00

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