EPFL PHYSICS COLLOQUIUM

Spin shuttling - a new paradigm for semiconductor spin qubits

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APERO after the colloquium

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Semiconductor qubits are compact, highly coherent and can be manufactured in industrial facilities. Single-and two-qubit gates reach fidelities well over 99%, and two-dimensional qubit arrays of increasing sizes are being realized. In the last few years, a new opportunity has been explored with great success, based on shuttling electrons around the chip while preserving spin coherence, allowing us to create reconfigurable interactions. In addition, we have shown that the act of shuttling in itself can be harnessed to perform tunable and high-fidelity single- and two-qubit operations. This is leading us to rethink how to construct large-scale, fault-tolerant quantum processors, taking advantage of mobile qubits.

School of Basic Sciences

Organized by the Institute of Physics

Host: Prof. Pasquale Scarlino