

23 settembre 2019 – ore 15.00

Aula Massimilla – Scuola Politecnica e delle Scienze di Base - Piazzale Tecchio



VII Antonio Barone Lecture

Prof. Daniel Esteve

Quantronics, CEA- Paris Saclay

Superconducting circuits for quantum technologies

The discovery in the mid 1980s that quantum mechanics provides resources for performing computational tasks beyond reach of machines with a classical Von Neumann architecture triggered an intense research of the quantum bits needed for making a quantum computer. In the domain of electrical circuits, superconducting quantum bits based on Josephson junctions are presently the most advanced qubits. I will describe the superconducting qubits used nowadays and the operation of an elementary quantum processor. I will explain the scalability challenge induced by quantum error correction, and will introduce the alternative routes for facing it. The one we develop is based on spins with superior quantum coherence coupled to quantum circuits. I will present the progress achieved in the control of a small number of electronic spins, and the perspectives open for ultimate magnetic resonance and quantum information processing.



Daniel ESTEVE is research director for Quantronics at CEA Saclay. His research field is mesoscopic physics, and in particular quantum coherent transport and quantum electrical circuits.

Interverranno:

Il Presidente della Scuola Politecnica e delle Scienze di Base: Prof. P. Salatino

Il Direttore del Dipartimento di Fisica Ettore Pancini: Prof. L. Merola

Il Coordinatore del Dottorato in Tecnologie Quantistiche: Prof. F. Tafuri



Le lezioni intitolate ad Antonio Barone sono state istituite dal Dipartimento di Fisica Ettore Pancini per onorare la memoria di Antonio Barone, professore emerito di Struttura della Materia prematuramente scomparso nel 2011 .