

Seminario di Dipartimento SMFI**Prof. Angelo Di Bernardo***University of Salerno, Department of Physics, Fisciano***Investigation of novel phenomena and effects
for superconducting electronics****Abstract:**

The application of superconducting devices for the processing and encoding of digital information has raised great interest because they can help reduce the power consumption of high-performance computers, whilst offering ease of coupling with other devices also based on superconductors like superconducting single photon detectors and superconducting qubits. Several approaches and material platforms have been recently proposed for the realization of superconducting electronics, which can offer better performance than conventional metal-oxide semiconductor (CMOS) architectures or already-existing superconducting logics like single flux quantum. These approaches include superconducting spintronics, where superconductor/ferromagnet (S/F) hybrids are used for the generation of Cooper pairs of electrons carrying a net spin (spin triplets), and three-terminal superconducting devices, where a gate voltage is applied to control the supercurrent flowing in a narrow superconducting constriction and set the device logic state. In this talk, I will review the progress done in these research fields, starting from the spectroscopic and fundamental studies that have led to their establishment, and going through the most promising material platforms and device geometries for their future development. I will also outline the main challenges that have to be overcome, for each of the approaches discussed, toward the realisation of superconducting circuits that can be scaled up and fully integrated in high-performance computing and quantum computing architectures.

giovedì 27/3/2025, ore 16:30 Aula Maxwell (plesso fisica)