Aula F8 - Maria Marinaro **ore 09:00 – 13:30**

Sezione II
Fisica della materia
Presiede: Caviglia A. (Università di Ginevra)

Relazioni su invito

▲ **Optomechanical coupling of orbital angular momentum with membranes.**
Parisi M. ([1]), Marino A. ([2]), Borrielli A. ([3]), Bonaldi M. ([3]), Piccirillo B. ([4]), Paparo D. ([5]), Rubano A. ([4]), Mosca S. ([1])
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Optomechanical linear momentum coupling has been demonstrated in classical and quantum regime and in pioneering Beth's experiment the spin part of the photon angular momentum was involved in the manipulation of macroscopic objects. However, Allen *et al.* in 1992 pointed out the possibility to also transfer orbital angular momentum (OAM) of light to matter. The OAM, unlike spin, can in principle take unlimited values making it attractive in the communication field to potentiality transfer a wealth of information between different nodes of a network. Recently, torsional oscillators have been used to couple and detect optical OAM and optomechanically induced transparency phenomenon in a rotational-cavity have been investigated and proposed for the OAM detection. Here, we propose to exploit optomechanical coupling by using an ultra-low dissipation mechanical silicon nitride membrane, to realize a transducer of orbital angular momentum of light. We couple OAM from optical to mechanical domain by the coupling between a Hermite-Gauss beam (1,1) and the first normal mode of the membranes.

▲ **Voltage-driven control of superconducting currents.**
Di Bernardo A. ([1])([2]), Ruf L. ([1]), Koch J. ([1]), Cirillo C. ([3]), Puglia C. ([4]), Puliyappara-Babu P. ([1]), Hartmann R. ([1]), Vecchione A. ([3]), Belzig W. ([1]), Giazotto F. ([4]), Attanasio C. ([2]), Scheer E. ([1])
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In conventional metal-oxide semiconductor (CMOS) electronics, the logic state of a device is set by a gate voltage (V_g). The superconducting equivalent of such effect had remained unknown until it was recently shown that a V_g can tune the superconducting current (supercurrent) flowing through a nanoconstriction in a superconductor. This so-called gate-controlled supercurrent (GCS) effect has raised great interest because it can lead to superconducting logics like CMOS logics, but with lower energy dissipation. In this talk, I will review the