UNIVERSITÀ DI PARMA

Seminario di Dipartimento SMFI

Prof. Alessandro Ridolfo

Department of Physics and Astronomy "Ettore Majorana", University of Catania

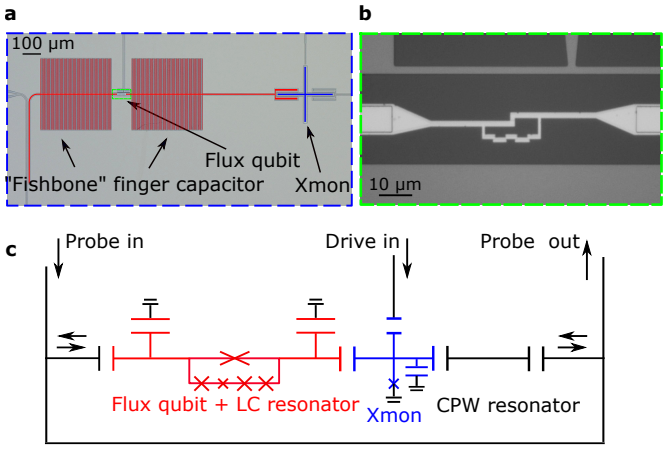
terrà un seminario dal titolo

Coherent detection of non-perturbative light-matter interaction

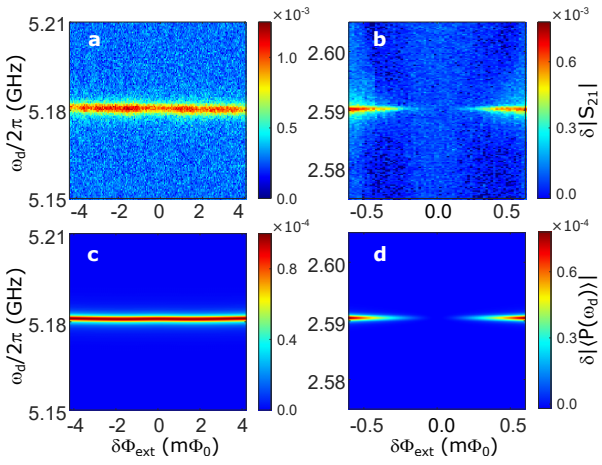
Abstract:

Hybrid quantum systems in the ultrastrong, and even more in the deep-strong, coupling regimes can exhibit exotic physical phenomena and promise new applications in quantum technologies. In these non-perturbative regimes, a qubit–resonator system has an entangled quantum vacuum with a nonzero average photon number in the resonator, where the photons are virtual and cannot be directly detected. However, the vacuum field is able to induce the symmetry breaking of a dispersively coupled probe qubit. Here we show, by exploiting an input/output theory well designed for a coherent probe source, the spectroscopical evidences of such a symmetry breaking of the selection rules. Furthermore, for a very weak coherent probe, we also show that the method herein exploited can bring semi-analytical formulas, very useful for a clear understanding of the physics behind the observed effects.

mercoledì 22/3/2023, ore 16:30, Aula Newton (plesso fisica)



Scheme of a lumped-element LC resonator coupled to a flux qubit.



Single and two-photon excitation spectra