# Impiego di transmoni superconduttori per la rivelazione di assioni e materia oscura

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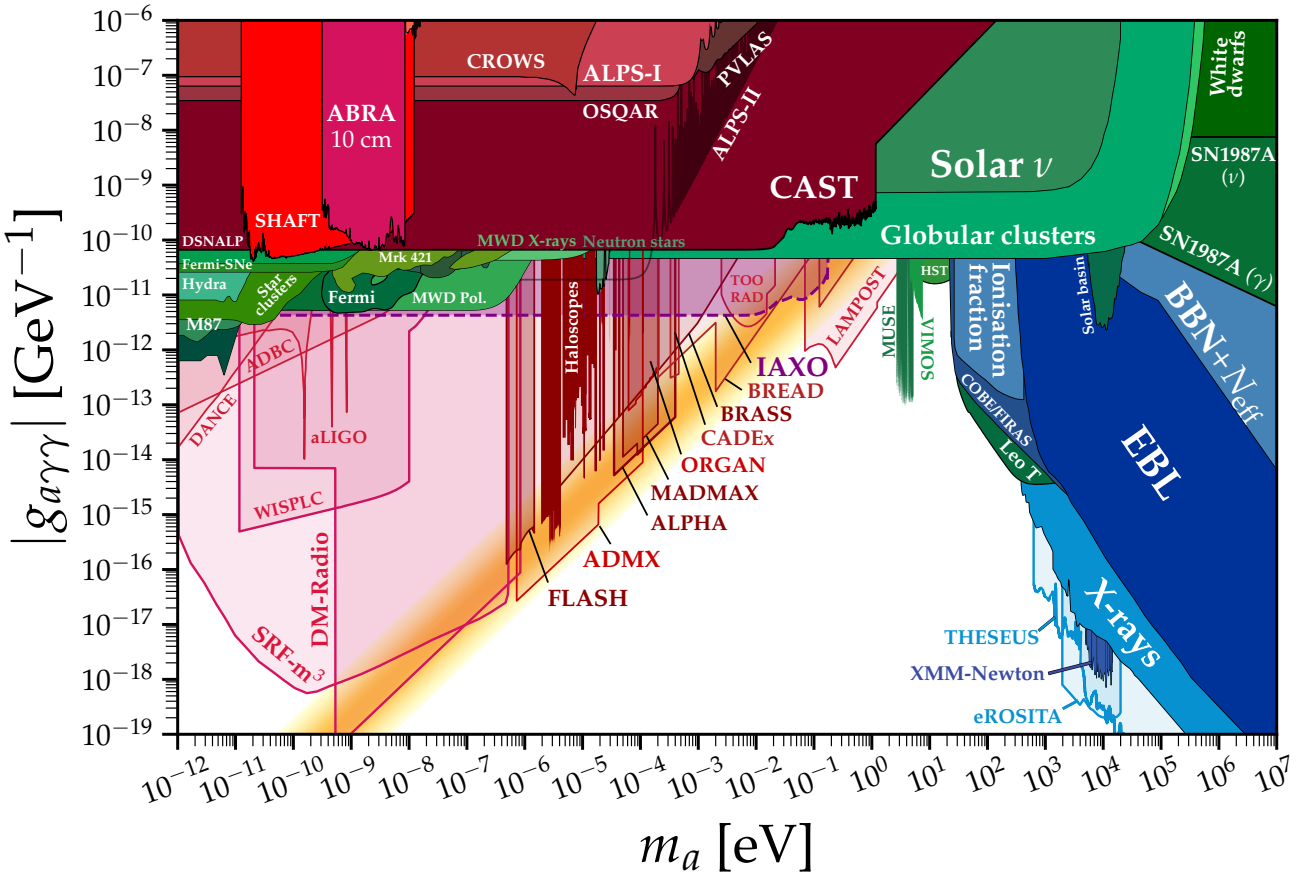
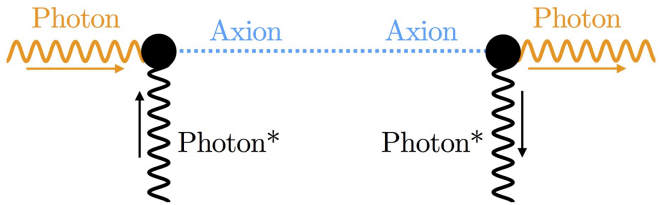
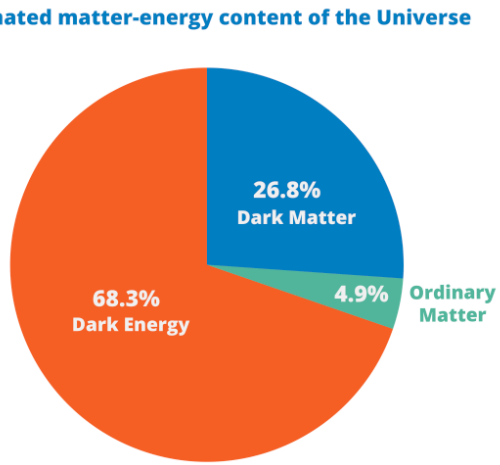
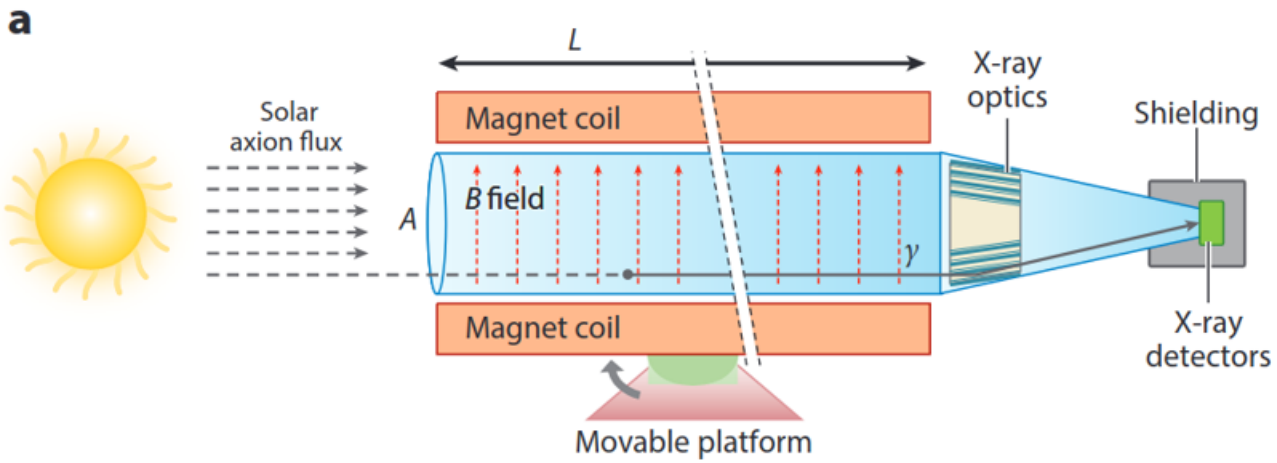
# Gli assioni: candidati per la materia oscura

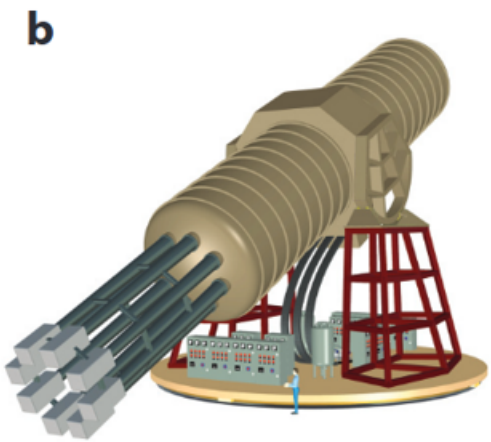


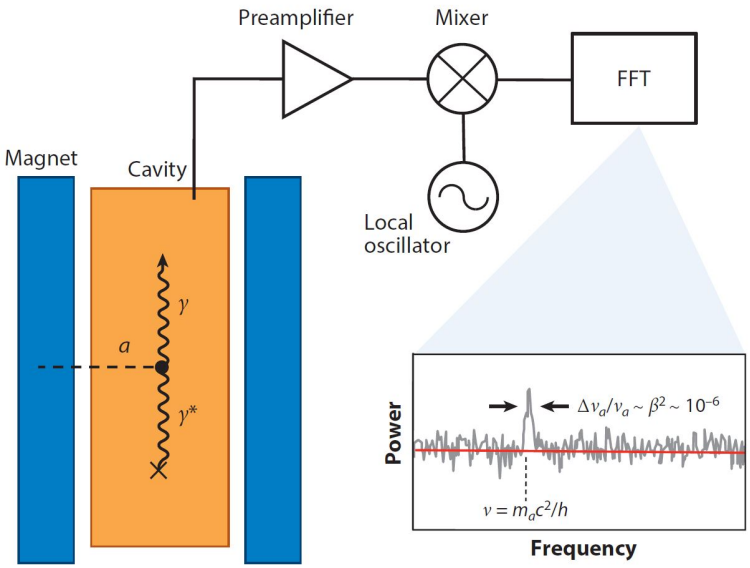



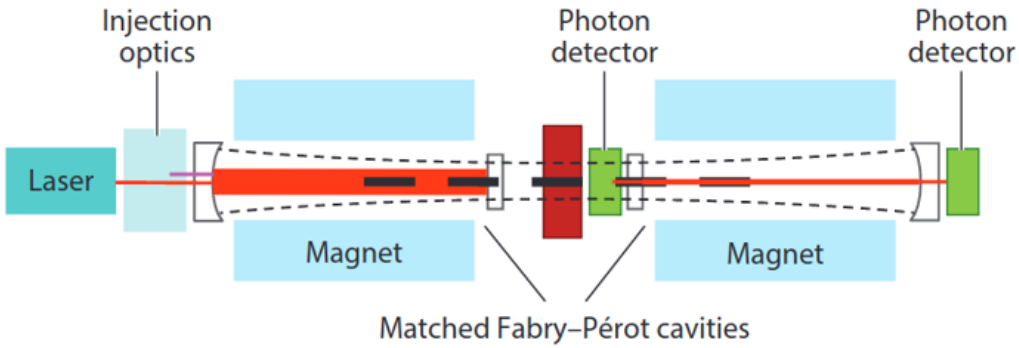



# Tecniche di rivelazione (Elioscopi, Aloscopi, LSTW)



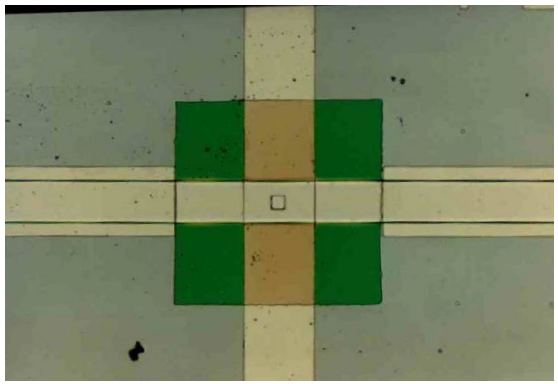



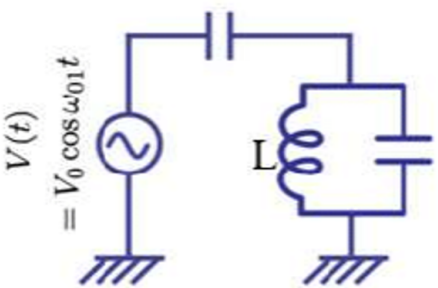



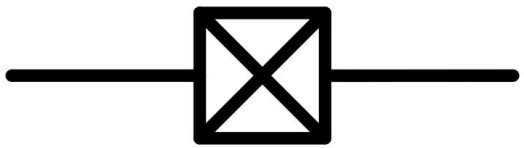
# Qubit superconduttori e giunzioni Josephson

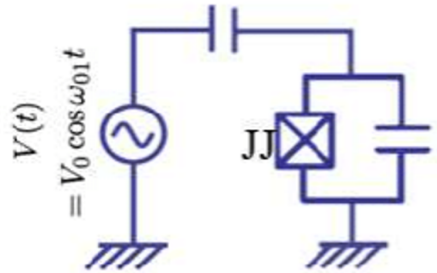
$$\hat{H} = \frac{\hat{Q}^2}{2C} + \frac{\hat{\Phi}^2}{2L}$$

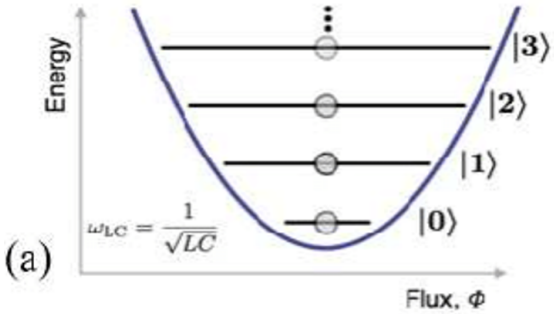


$$\hat{H} = \frac{\hat{Q}^2}{2C} - E_J \cos\left(\frac{2\pi\hat{\Phi}}{\Phi_0}\right)$$

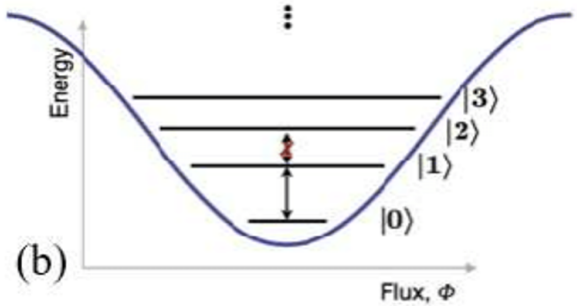




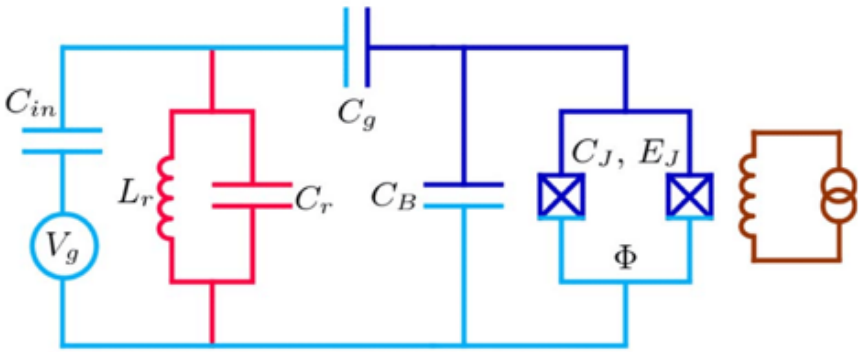



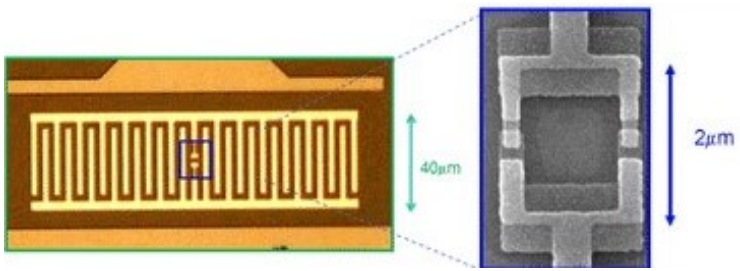

$$I = I_0 \sin\left(\frac{2\pi\Phi}{\Phi_0}\right)$$

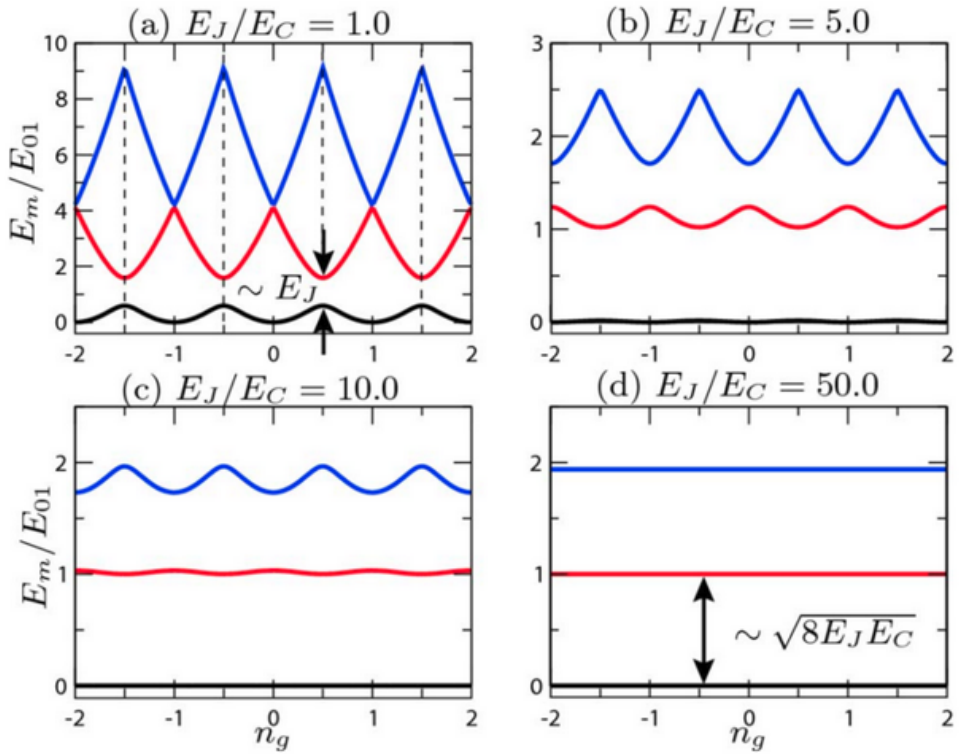


# I transmoni

$$\hat{H} = 4E_C(\hat{n} - n_g)^2 - E_J \cos\hat{\varphi}$$

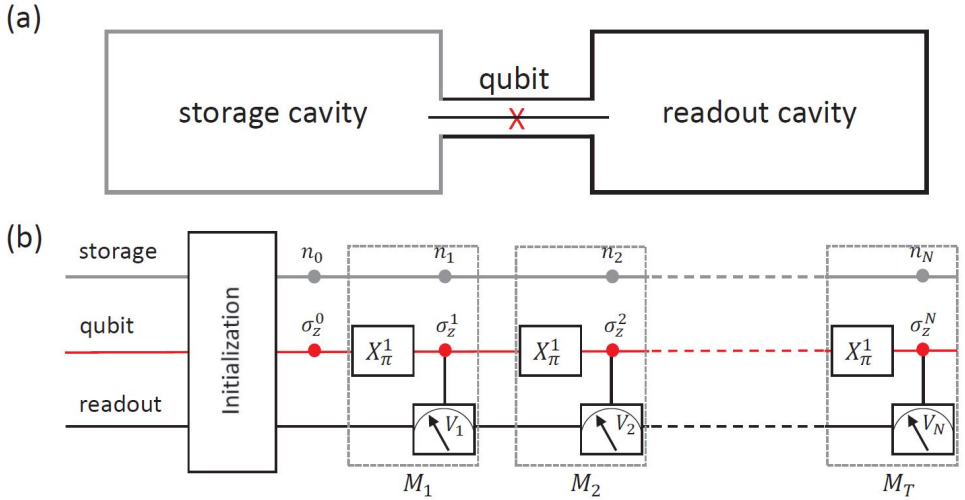


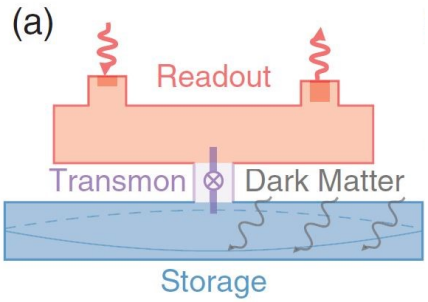



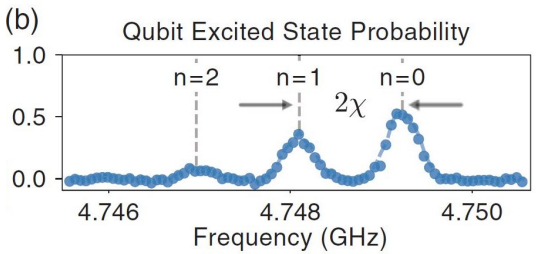



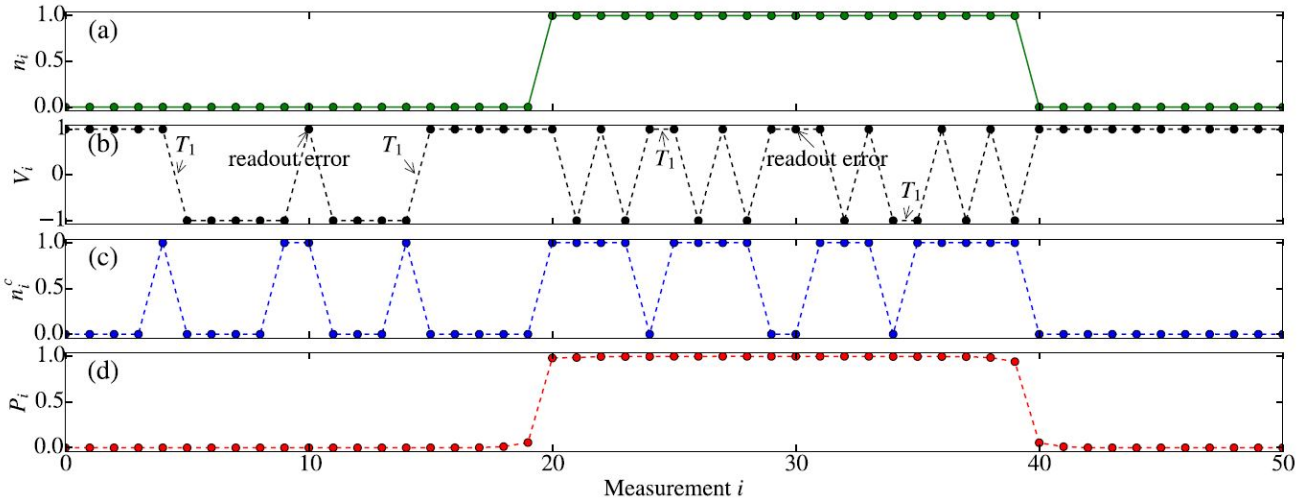
# Impiego dei transmoni per la rivelazione dei singoli fotoni nelle microonde *(Qubit-based photon counter)*

***Quantum nondemolition (QND) measurements*:** un nuovo impulso per la ricerca di assioni e non solo...



# Grazie!

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**Fonti Immagini:**
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