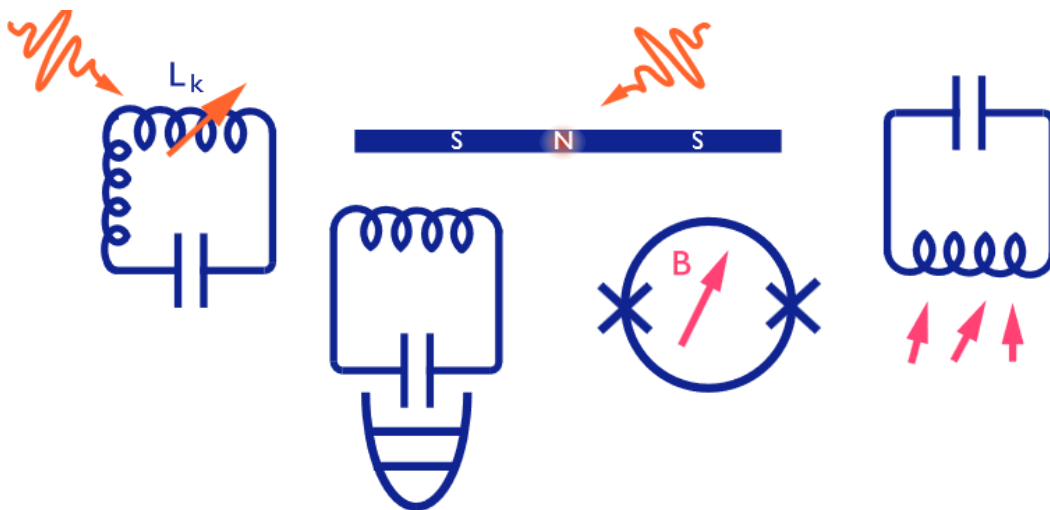


Sensing with superconducting circuits

Pushing sensitivity to the limits and beyond

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The exceptional sensitivity attained by quantum sensors has a wide range of applications in areas including quantum electronics, communication, astrophysics, medicine, geology, and beyond. At the core of many of these cutting-edge sensors lies the phenomenon of superconductivity. Due to their coherence over macroscopic distances and their non-linear response to small perturbations, so-called superconducting circuits are at the core of the quantum technologies. By utilizing quantum principles, these sensors can perform better than their classical counterpart. They are able to detect single particles like photons, electrons, spins, or phonons with unparalleled accuracy, as well as ultra-low magnetic fields and waves spanning a wide spectrum.



Simplified schematics of some sensing mechanism using superconducting circuits.

This mini-colloquium will feature illuminating discussions and presentations by leading experts. It will delve into the fundamental principles underpinning superconducting circuits-based sensing, their ultimate limit of quantum detection, the latest technological innovations, the different challenges to extending superconducting circuits to more daunting experimental conditions, as well as envision new applications.