

## **Seminar**

### **High sensitivity ESR for quantum sensing and computing**

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In a conventional electron spin resonance (ESR) spectrometer based on the inductive detection method, the paramagnetic spins precess in an external magnetic field  $B_0$  radiating weak microwave signals into a resonant cavity. Despite its widespread use, ESR spectroscopy has limited sensitivity and large amounts of spins are necessary to accumulate sufficient signal. Exploiting recent progress in circuit-quantum electrodynamics, we have combined high quality factor superconducting micro-resonators and noise-less Josephson Parametric Amplifiers to perform ESR spectroscopy at millikelvin temperatures, reaching a new regime where the sensitivity is limited by the quantum vacuum fluctuations of the microwave field. In this talk, I will discuss this new ESR regime and its prospects for quantum technology.

***Monday, Oct 10<sup>th</sup> 2022***

***4:00 PM (Tea/Coffee at 3:45 PM)***

***Auditorium, TIFR-H***