



**S N BOSE NATIONAL CENTRE
FOR BASIC SCIENCES**

Block JD, Sector III, Salt Lake, Kolkata 700 106



DEPARTMENTAL SEMINAR

Condensed Matter Physics and Material Sciences

12th January'2022

4.00PM

ONLINE

SPEAKER



**Prof. Anjan Kumar Gupta
Professor, Physics Department, Indian Institute of Technology, Kanpur**

TITLE OF THE TALK

Optimization of Nb μ -SQUIDs for single particle nano - magnetism

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ABSTRACT

Superconducting QUantum Interference Devices (SQUIDs) are the most sensitive magnetic field sensors with large number of applications. SQUIDs with size in micron or sub-micron range provide a much better coupling with nano-particles and thus such μ -SQUIDs have been successfully used in probing magnetism of single nano-particles. This technique can be further improved for higher speed and sensitivity with hysteresis-free μ -SQUIDs. In this talk we first review the basics of Josephson effect and working of a conventional SQUID magnetometer. Next we discuss how μ -SQUIDs have been realized and used in some of the nano-particle measurements. A limitation of these μ -SQUIDs, namely thermal hysteresis, will be discussed next. We then discuss how hysteresis can be eliminated followed by some of our recent measurements on nano-scale magnetic structures. If time permits, I can also share an interesting outcome of this thermal hysteresis (or bistability), namely stochastic resonance.

HOST FACULTY

Dr. Thirupathaiah Setti

Assistant Professor & Seminar Coordinator, CONDENSED MATTER PHYSICS AND MATERIAL SCIENCES
