

Seminar

Sensing Quantum Functionalities at the Atomic Scale

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Nanoscale systems with technologically relevant properties have created a demand for powerful experimental techniques capable of extreme spatial resolution. We use low-temperature Scanning Tunnelling and Atomic Force Microscope (STM/AFM) to focus on the different aspects of quantum functionalities on surfaces at the atomic scale.

For example, I will present how a single bio-molecule may be made magnetic by passing current through it and can be switched reversibly between different spin states.

Later I will show evidence of supercurrent reversal in a superconducting nano-junction incorporating a single spin, scaling down the concept of superconducting quantum interference device (SQUID) to the smallest limit with its loop area being effectively zero.

Further as a long term objective, I will discuss the possibilities of integrating ultra-short laser pulses with STM to achieve the desired space-time resolution to directly capture the dynamics in atoms and molecules.

Tuesday, Mar 4th 2025

16:00 Hrs (Tea / Coffee 15:45 Hrs)

Auditorium, TIFRH