

Seminar

Two promising single photon sources for quantum network applications: a few advances

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In entanglement distribution-based quantum repeaters, one of the key resources is optically mediated entanglement between distant qubits which can be generated and controlled deterministically. In this context, on one hand, atomic defect centres in solid as single photon emitters are suitable candidates as they possess optically active spin qubits that can be controlled with high fidelity, and on the other hand, nonlinear optical processes like spontaneous parametric down conversion (SPDC) have been demonstrated as efficient methods for generating entangled photon pairs. In this presentation, I will talk about quantum control sequences for initialising a quantum register associated with a single nitrogen vacancy (NV) centre in diamond, a promising single photon source for quantum network applications. Moreover, I will present our recent experimental results on generating energy correlated photon-pairs using cavity-enhanced SPDC and their frequency resolved detection, which are necessary for building a frequency multiplexed quantum repeater.

Tuesday, Feb 28th 2023

4:00 PM (Tea / Coffee 03.45 PM)

Auditorium, TIFR-H