

Seminar Talk

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“Harnessing Light-Matter Interaction for Scalable Quantum Technologies: From Nanofiber Coupling to Remote Quantum Gates”

Abstract

Enhancing light-matter interaction is crucial for the advancement of quantum technologies. In this talk, I will describe how a composite waveguide, formed by a pair of parallel optical nanofibers, enhances photon coupling efficiency, enabling long-range entanglement, superradiance, and subradiance. These effects have significant potential applications in quantum sensing and quantum memories. Additionally, I will present the realization of a remote Mølmer-Sørensen gate for neutral atoms in a coupled-cavity QED system, where optimal control techniques are employed to achieve robust entangling operations, even in the presence of decoherence. These advancements contribute to the development of distributed quantum computing and scalable quantum networks.

Tuesday | 25.03.2025 | 11:00am

2S17 | ICT building