Indian Statistical Institute (ISI),
Kolkata - 700108

Physics & Applied Mathematics Unit
(PAMU)

Quantum networking with short-range entanglement assistance

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Abstract

Quantum networks distribute high-fidelity, high-rate entanglement between network nodes as a resource for information processing applications. Current proposals for entanglement distribution in quantum networks utilize the local operation and classical communication (LOCC) framework to obtain high-fidelity states. However, due to the resource intensive nature of LOCC protocols, the entanglement distribution rates over even modest distances (~ 100 km) are extremely low and limit the advantage of all quantum protocols.

In this talk, I will describe our recent work that utilizes a previously unused class of entanglement manipulation protocols, the entanglement-assisted local operations and classical communication (ELOCC) protocols, for high-fidelity entanglement distribution in quantum networks. Specifically, I will describe the application of catalytic entanglement transformations over network edges that can significantly enhance the rate of high-fidelity entanglement distribution in quantum networks. I will close with interesting further research directions.

Venue

PAMU Seminar Hall

A.N. Kolmogorov Building,
ISI, Kolkata

Date & Time

27th January, 2023
03:00 PM

Everyone is invited to attend

Head, PAMU