Plenary Talk PV XII Fri 9:45 RW 1

Quantum Networks: The Missing Link — •Gerhard Rempe — Max-Planck Institute of Quantum Optics, Hans-Kopfermann-Straße 1, 85748 Garching, Germany

Quantum science and technology are most promising research fields with several subfields like quantum communication and quantum computation. Both of these subfields are highly successful, but seem incompatible, as communication and computation require open and closed platforms, respectively. Recent experiments have now demonstrated that optical cavity quantum electrodynamics constitutes a new platform that can efficiently execute both quantum communication and computation tasks with qubits of light, or matter, or both. This opens up a realistic avenue towards a scalable quantum information processing architecture in form of a distributed quantum network and eventually a global quantum internet with quantum repeaters on long distances [1].

[1] A. Reiserer and G. Rempe, Rev. Mod. Phys. 87, 1379 (2015).