

Frontiers of Entangled Photons in Quantum Imaging and Quantum Communication

Prof. Dr. Anton Zeilinger

University of Vienna & Austrian Academy of Sciences

Entangled photons can now routinely be used in quantum communication over large distances exceeding 100 kilometers. I will review recent experiments, particularly in quantum teleportation and entanglement swapping on the Canary Islands. A novel possibility is given by photon states carrying orbital angular momentum. In that case, one can go beyond the one-bit-per-photon limit and in principle have an arbitrarily large alphabet carried by an individual photon. In quantum imaging, novel possibilities arise, where the image is obtained with photons that did not interact with the object and the photons which interact with the object are not detected.