

Heralded Entanglement between widely separated atoms

Harald Weinfurter

Department für Physik, Ludwig-Maximilians-Universität München

Entanglement between distant stationary quantum systems will be a key resource for future applications in the field of long-distance quantum communication, like quantum repeaters and quantum networks. At the same time, it is an essential ingredient for new experiments on the foundations of physics, in particular for a first loophole-free test of Bell's inequality. Furthermore, entanglement can also enhance resolution for metrology as shown here with multiphoton interferometry.

The main topic is our recent progress on establishing entanglement between two single Rb-87 atoms over a distance of 20m.