SFB/TRR 21 - Kolloquium
25. Mai 2007, Ulm

Prof. Dr. Paulo Nussenzweig

(Universidade de São Paulo, Brasilien)

Bright multicolor entangled light

Entanglement between bright optical beams can be generated quite simply from initially squeezed beams combined on beamsplitters. Yet, this approach is limited to single-frequency entangled light. Direct generation of entanglement, on the other hand, by means of nonlinear processes, can produce fields of different frequencies (or colors). This opens up the possibility of changing the color of quantum information and connecting pieces of quantum hardware which interact with light at different frequencies. The system we study is the above-threshold optical parametric oscillator. Entanglement between the twin beams it produces was predicted in 1988, but was only experimentally verified in 2005, owing to the difficulty in measuring phase noise. Shortly after, we predicted that this simple and very well-known system should directly produce tripartite entanglement, between the bright pump, signal, and idler beams. In this talk, I will present our measurements of twin beam entanglement and also of bright three-color optical quantum correlations, a first step towards tripartite entanglement.

25. Mai 2007, 14:00 Uhr

Universität Ulm, Raum N24/H12
Albert-Einstein-Allee 11, 89081 Ulm

CO.CO.MAT