TRR 142
Tailored Nonlinear Photonics

TRR Guest Scientist Lecture / Seminar

Date/Time: 13.06.2018 / 14:00 Uhr
Location: Paderborn, P8.4.09

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Theoretical and experimental aspects of multiphoton interference

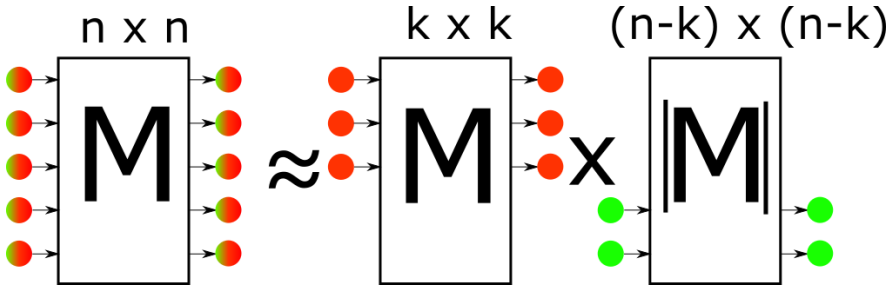
Abstract:

Interference of many photons is a promising avenue both for a demonstration of a quantum advantage and for quantum simulations. In this talk, I will present several aspects of our recent progress on this topic, both from the theoretical and experimental side.

First, I will present our theoretical efforts to understand the required level of photon quality (distinguishability and photon loss) required to preserve the hardness of boson sampling. I will present our recent result showing that there is an upper limit to the number of photons that can be meaningfully interfered, given by the level of indistinguishability of these photons.

Second, I will present our work on implementing arbitrary unitaries in imperfect photonic systems, e.g. photonic chips, which have some restrictions on their attainable range of splitting ratios and phase shifts.

Third, I will present quantum interference results on an 8 by 8 silicon nitride tunable chip, which was fabricated by Lionix B.V. and characterized by the Laser Physics and Nonlinear Optics group at the University of Twente. These results represent a proof-of-principle demonstration of the suitability of silicon nitride as a platform for quantum experiments.



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