TRR 142
Tailored Nonlinear Photonics

TRR Guest Scientist Lecture / Seminar

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Location: Paderborn / P8.4.09

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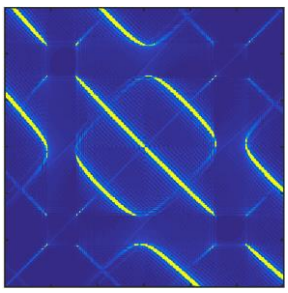
Customizing the joint spectrum of quantum light generated via nonlinear optics

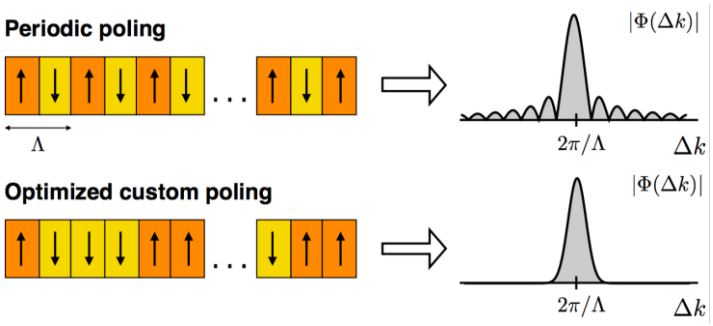
Abstract:

Experimental optical quantum information science has seen rapid growth over the last 15 years. To a large extent, this success was achieved by our ability to reliably prepare certain photonic quantum states using nonlinear optical processes such as spontaneous parametric down-conversion (SPDC) and spontaneous four wave mixing (SFWM).

In this talk, I will give a brief introduction to quantum state generation using nonlinear optics, followed by an overview of our work on customizing the poling configuration of nonlinear crystals using simulated annealing. Such customized designs could increase the spectral purity of generated single photons by orders of magnitude over conventional SPDC methods.

I will finish by discussing our proposal to use Bragg gratings for suppression of competing processes in dual-pump SFWM (work in progress). This will have application in the generation of degenerate photon pairs in integrated optics.





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