

Abstract Submitted
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New Tools for Photonic Entanglement GREGOR WEIHS, University of Vienna — Optical technologies are employed in many areas of quantum information, particularly for quantum communication protocols. Apart from detectors and memories, sources of entangled photon pairs are the most important building blocks. After reviewing some recent work on semiconductor microcavities, I will present ideas for novel sources of entangled photon pairs based on semiconductor nanostructures. Parametric down-conversion in photonic crystals can achieve phase and group matching enabling highly efficient devices. Another approach will use semiconductor quantum dots to create time-bin entangled photon pairs. In the latter case only one photon pair will be produced at a time. Single pairs are important for the interferometric construction of multipartite entangled states and linear optic quantum computation.

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