



Centre de Nanosciences et de Nanotechnologie

Seminar

Thursday March 8th 2018

11 h – C2N Site de Marcoussis, Salle R. Planel

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From orbital angular momentum entanglement to polarized quantum dot cavity QED

Abstract:

Photons can have an orbital angular momentum in addition to polarization or spin angular momentum. I will show how also more than two photons can be entangled in this high-dimensional degree of freedom, which opens up fundamental studies in high-dimensional multi-partite entanglement spaces. Then I will turn to polarization effects in III-V based micropillar cavities with a single quantum dot. On one hand, I show how we gained high-fidelity control of the cavity mode polarization using the electro-optic effect, allowing full restoration of the cavity mode polarization degeneracy. On the other hand, I demonstrate that cavity polarization splitting can be very useful for instance for investigation of the unconventional photon blockade effect in a weak coupling regime. We found that, using a single quantum dot transition that is coupled simultaneously to two orthogonally polarized cavity modes, by careful tuning of the input and output state of polarization, we can reach the regime of unconventional photon blockade.



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