



Seminarankündigung

**Dienstag, 23. Juli 2013
13:00 Uhr**

WSI, Seminarraum S 101

“Pyramidal QDs: Site control and high symmetry. Everything you wanted to know about entangled photon emission and entropic/capillarity effects”

To make photonic quantum information a reality a number of challenges need to be overcome. One of the outstanding challenges is the problem of obtaining reproducible and scalable “entangled” photon generators, having in mind that they should be compatible with current technologies for integration with waveguides, optical devices (e.g. phase modulators) and detectors. Most current QD systems are limited in their capabilities by their intrinsic lack of symmetry, which only allows to obtain a small number (typically between $1/10^3$ and $1/10^5$) of good dots on a single chip. Here we show that with a new family of (111) grown pyramidal site-controlled $\text{InGaAs}_{1-d}\text{N}_d$ quantum dots it is possible to obtain areas containing as much as 15% of polarization-entangled photon emitters, showing fidelities as high as 0.721 ± 0.043 . We will also spend some time on growth modelling, showing that previous works which are often cited (on V-grooves quantum wires, which share the same growth mechanism) encompass too crude simplifications to truly describe the actual phenomenology. We will demystify the role of entropy of mixing effects and their interplay with capillarity.

**Dr. Emanuele Pelucchi
Tyndall National Institute
University College Cork, Ireland**