CARL VON OSSIETZKY universität OLDENBURG
Institut für PHYSIK

PHYSICAL COLLOQUIUM

INVITATION

Monday, 09.11.2020, 4.15 p.m.,

speaks

Ass. Prof. Ana Predojević,

Department of Physics, Stockholm University, Stockholm, Sweden

about

"Entanglement generation in semiconductor nanostructures"

Entanglement forms the essence of quantum technologies. Specifically, the entanglement of photons enables applications such as secure quantum communication and photonic quantum simulations. The leading platform for ondemand generation of entangled photon pairs is semiconductor quantum dots. Furthermore, this system can be exploited to form quantum memories for photonic quantum information and mediate the interaction between photonic qubits. In this talk, I will show how the parameters of the deterministic photon pair generation can be controlled and used for creation of entanglement. The photon entanglement we aim at is in time bin – a degree of freedom essential for fiber telecommunication networks, where entanglement in polarization is incompatible. Furthermore, I will present our results on generation of multidimensional entanglement that is required for high efficiency free space quantum communication. Finally, I will show how the degree of entanglement and photon pair rate can be significantly improved by appropriate engineering of the photonic environment and discuss the possible use cases of this technology for achieving a functional and safe quantum communication link.

All interested persons are cordially invited.

Sgd. Prof. Dr. Christian Schneider