Halbleiter-Nanophotonik

SFB 787

Einladung

Es spricht: **Dr. Fei Ding**
Institute for Integrative Nanosciences, IFW Dresden

Zeit: **Donnerstag, 30. Juni 2016, 15:00 Uhr**

Ort: **Technische Universität Berlin**
Institut für Festkörperphysik
Hardenbergstraße 36, 10623 Berlin
Raum EW 431

Thema: **„Semiconductor entangled photon sources: Electrical injection and Energy tunability"**

Abstract:

Entangled photon sources are playing a crucial role in photonic quantum information science. Self-assembled semiconductor quantum dots (QDs) are among the most promising sources for on-demand generation of entangled photons. Compared to other candidate systems, QDs have an undeniable advantage of being compatible with mature semiconductor technologies.

For the long-pursued entanglement swapping and the hybrid coupling schemes, the wavelength (energy) of the entangled photons must be tunable. By embedding the QDs in stretchable nanomembranes, we have developed a unique strain tuning technique to engineer the QDs.[1-2] In this talk I will first explain the technique by introducing a wavelength tunable single photon source.[3-4] Then an electrically triggered entangled photon source with QDs will be introduced.[5] We have demonstrated an entangled light-emitting-diode with ultra-fast operation speed and high yield. Finally our latest generation of strain engineering platform will be presented, where the III-V QD sources are integrated on silicon substrate with ultra-small footprints,[6] and wavelength tunable entangled photons are demonstrated. These resutlst will lead to several exciting quantum photonic experiments.

References:

[1] F. Ding*... O. G. Schmidt **Phys. Rev. Lett.** 104, 067405 (2010)
[2] F. Ding*... O. G. Schmidt **Nano Lett.** 10, 3453 (2010)
[3] J. Zhang...F. Ding*, O. G. Schmidt **Nano Lett.** 13, 5808 (2013)
[4] Y. Huo...F. Ding... O. G. Schmidt **Nature Phys.** 10, 46 (2014)
[5] J. Zhang...F. Ding*, O. G. Schmidt **Nature Commun.** 6, 10067 (2015)
[6] Y. Chen...F. Ding*, O. G. Schmidt **Nature Commun.** 7, 10387 (2016)

Gäste sind herzlich willkommen!
Prof. Dr. S. Reitzenstein