LUND UNIVERSITY

NANOLUND

AT THE FOREFRONT OF NANO SCIENCE

Prof. Sven Höfling
Universität Würtzburg, Germany and
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NANOSCIENCE COLLOQUIUM

Thursday
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at 15:15,
K-space, Fysicum

Nano-tailored photonic devices

Semiconductors have revolutionized our life. While silicon remains to be the most important semiconductor material, it has an indirect band gap which makes it unfavorable for photonic applications. Most III-V compound semiconductors have however a direct band gap, and that is why they are largely utilized for optoelectronic devices. By employing quantum engineering of III-V semiconductor materials and controlling the device fabrication with nanoscale precision, we realize various innovative devices. For instance mid-infrared interband cascade lasers with about 2000 nanometer scale layers show room temperature continuous wave threshold currents as low as 15 mA. Furthermore, by the integration of single InGaAs quantum dots into microcavities single photon sources with efficiencies of up to 75 % are fabricated. In addition, I will present briefly results on single monolayer transition metal dichalgcogenides, that show single photon emission or strong light-matter coupling to a Tamm plasmon structure.

Host: Lars Samuelson (Solid State Physics)