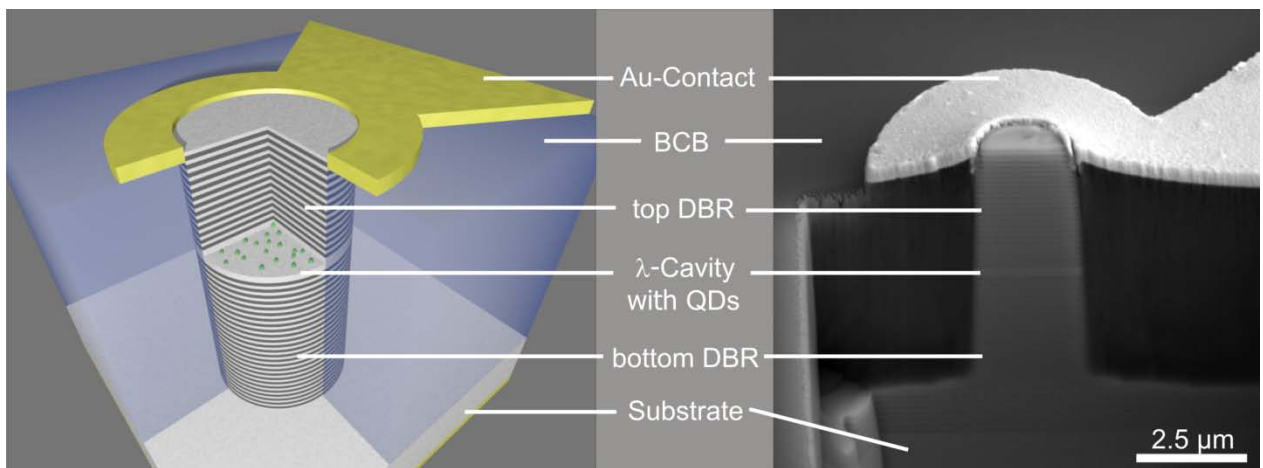




We offer a Master/Diploma position in the III-V semiconductor spectroscopy group. The main interest of our group is focused on the use of optical spectroscopy techniques to investigate the fundamental issues of light matter interaction in semiconductor nanostructures and their potential as novel light sources.

In particular, we are interested in the optical and electronic properties of semiconductor quantum dots embedded in high quality micropillar resonators. These structures (see figure below) have proven to be very suitable candidates for single photon sources as well as ultra-low threshold lasers [1].



Recently it was shown, that a chaotic semiconductor laser with an external cavity is capable to generate random numbers at an ultra-fast rate of up to 300Gbit/s, which has wide applications in quantum cryptography, stochastic modelling and Monte Carlo simulations [2]. Therefore one of our goals is to explore the potential of chaotic behaviour in our micropillar structures.

You will be involved in the characterization of electrically driven micropillar structures and the experiments on chaotic laser emission. Chaotic behaviour will be identified by the photon statistics in a so called Hanbury-Brown and Twiss setup. In addition, you will help to improve the experimental setup and the software for data acquisition (LabView). The project will give you the opportunity to become familiar with modern experimental techniques and to get an profound insight into the fascinating world of nano-scaled semiconductor structures.

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