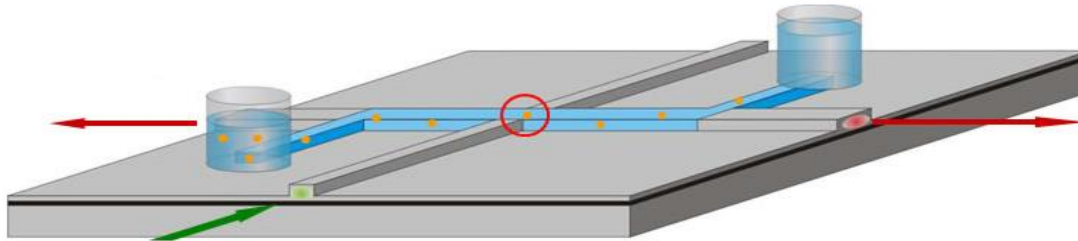


# Bachelor/Master Thesis Project

## Modification of Spontaneous Emission of Single Molecule in Microfluidic Channels

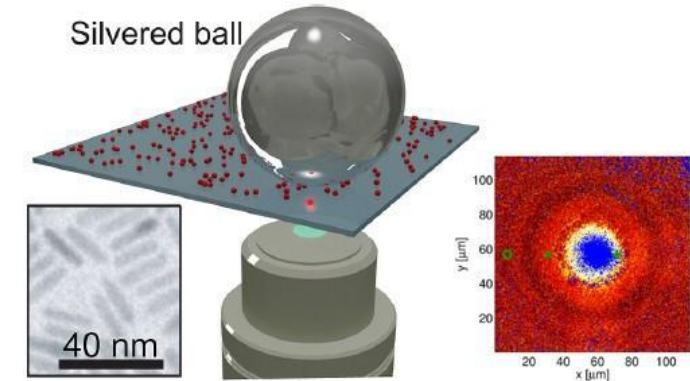
**Keywords:** Confocal microscope, microfluidics, single molecule, quantum efficiency, decay-rate distribution, spectroscopy, plasmonic

The quantum emitters have become important tools for the development of novel light sources for nanoelectronic and optoelectronic devices. In order to determine their suitability in potential application; quantum emitters such as color centers in diamond, fluorescence molecules and nanocrystals have to be characterized spectroscopically on ensemble and single particle level. Here, their optical properties, such as absorption and emission spectra, as well as their fluorescence decay kinetics need to be studied closely.



*Aim: Microfluidic chip for fluorescence analysis of nanoparticles in flow on single particle level*

We are looking for students interested in experimental and theoretical work for a bachelor or master thesis project. The goal is to design and produce a microfluidic device and to characterize the fabricated structures. As a second step a silver coated sphere will be integrated into to microfluidic device to selectively modify the spontaneous emission of single molecules in order to determine their quantum efficiency on single particle level.



Basic principle to derive the quantum yield of dye ensembles and single emitters from the modification of their emission characteristics by changing their dielectric surrounding. Here, a silver coated sphere acts as a mirror. The idea is to vary the distance between emitter and mirror surface to modify the radiative fluorescence decay rate.

**AG Nanooptik**  
**Ersan Özenci**  
[ozenci@physik.hu-berlin.de](mailto:ozenci@physik.hu-berlin.de)  
**Newtonstr. 15**  
**12489 Berlin R:1608**