

## Master thesis

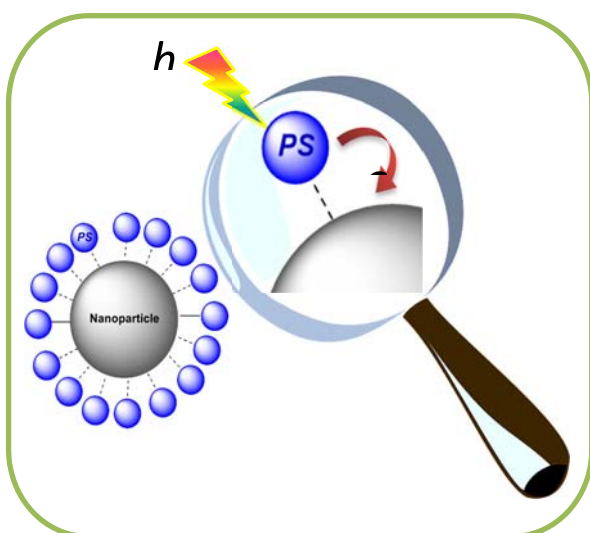
### *"Immobilization of Photosensitizers on Semiconductor Surfaces"*

**Starting date:** August 2018 or later

**Suitable for:** Master thesis

The project will be done in collaboration with Dr. Sonia Dsoke (IAM - ESS).

Semiconductor nanoparticles are considered appealing catalysts, since they combine high surface area with excellent stability and an easy recovery. They have been used successfully as photocatalysis, <sup>[1]</sup> however the band-gap of most of them is too high in energy to absorb visible-light directly. When the semiconductor nanoparticle is decorated with a light-harvesting antenna or photosensitizer (PS) and an efficient electron transfer occurs, the energy of light is sufficient to excite the active semiconductor. Heterogeneous molecular photocatalysis provides a potential opportunity to mimic natural photosynthesis with high efficiency. <sup>[2]</sup>



#### Your Project:

##### @IOC

- Synthesis of photosensitizer(s) based on organometallic complex(es);
- Immobilization on semiconductor nanoparticles (e.g. TiO<sub>2</sub>);
- Application on photocatalysis.

##### @IAM-ESS

- Complete electrochemical investigation of the photosensitizer(s) and the decorated nanoparticles.

[1] X. Liu, S. Inagaki, J. Gong *Angew. Chem. Int. Ed.* **2016**, *55*, 14924 – 14950;

[2] O. Ishitani *Top. Curr. Chem.* **2010**, *303*, 151-184.