

PhD position – Electrophoresis and manipulation at the single nanoparticle level

Job description

The Liquid Crystals and Photonics (LCP) group of the Faculty of Engineering and Architecture (Ghent University, Belgium) is seeking a highly motivated and enthusiastic PhD student to join our research team and to initiate his/her PhD research from September 2019 onwards.

Topic:

One of the research interests of the Liquid Crystals and Photonics group is in advanced measurement techniques and manipulation tools for nanoparticles in biomedical, photonic and display applications. Nanoparticles produce very weak photon fluxes and demonstrate fast Brownian motion, which make them very difficult to analyze on a particle-to-particle basis. The approach followed in our group is to combine single photon counting spectroscopy, a known spatial laser beam intensity profile and electric field induced particle motion, in order to characterize single nanoparticles.

The aim of this PhD research is

- i. To develop high-throughput screening of the transport properties (diffusion and electrophoresis) of fluorescent nanoparticles based on standing-wave electrophoretic fluorescence correlation spectroscopy
- ii. To actively trap single quantum dots and other nanoparticles using anti-Brownian electrokinetic trapping, allowing to analyze dynamics and inter-particle dynamics at the single nanoparticle level
- iii. To answer research questions related to dynamics of single quantum crystal nanoparticles (dots, rods, platelets), charging dynamics of nanoparticles in surfactant-doped nonpolar liquids, nanoparticle biosensors, and vesicles loaded with gold nanoparticles.

You are the person we are looking for if:

- You have a degree Master degree in photonics, physics, applied physics or electronics.
Note: to be admissible to the PhD program, your degree must be equivalent to 5 years of engineering studies (bachelor + master) in the European Union, and you must have a solid academic track record.
- You are interested in and motivated by the research topic, as well as in obtaining a PhD degree.
- You have excellent analytical skills.
- You are a motivated, communicative team worker.

- You speak and write English fluently (C1 CEFR level) and you have good communicating skills.

We can offer you:

- A fully funded 4-year PhD position in a challenging, stimulating and pleasant research environment, where you can contribute to our research on nanoparticle electrophoresis.
- An ambitious and dynamic environment in a successful, international research group.
- Experience in fabrication of devices, advanced microscopy, electrical and optical measurements and simulations.

Interested?

Apply with motivation letter, scientific resume, academic results, English proficiency scores, relevant publications, and a reference contact.

For any questions, contact prof. dr. ir. Filip Strubbe (filip.strubbe@ugent.be).