

## **vacancy: Early Stage Researcher position on “Single-nanoparticle discrete-charge analysis for life science applications”**

Since Millikan’s famous oil drop experiment about a hundred years ago, measurements of the electrical charge of single particles with accuracy higher than the elementary charge have been successfully applied in air and in vacuum. More recently, the same concept has been demonstrated in the Liquid Crystals and Photonics Group (LCP) on single particles in a nonpolar liquid. Since the technique relies on measuring discrete charge levels on a single particle, it allows to measure individual particle properties such as charge and size with unprecedented accuracy and dynamic changes of these properties with single-molecule precision. This PhD position is opened as part of a recently granted FWO project and aims to further develop the concept of discrete-charge measurements in liquids of higher interest for the colloid and life sciences, such as water. A strategy of high-field electrophoresis, dedicated microfluidics and fast optical detection of single nanoparticles will be used based on insights from protein charge ladders, which demonstrate that stable discrete charges can exist on nano-scale objects. The aim of this PhD is to pioneer and advance the field of single-particle discrete-charge analysis, and ultimately open up a wide variety of possibilities such as single-molecule biosensors, analysis of quantized interactions at the solid-liquid interface, and high-accuracy characterization and identification of viruses and other nanoparticles.

Your PhD work will be situated within the LCP Group which consists of 4 professors, 1 postdoc and about 10 PhD students, at the faculty of engineering of Ghent University (Belgium). The LCP Group aims at the development of new electro-optical devices based on liquid crystals, luminescent materials or solar cells, and electrophoretics (such as electronic ink displays). The latter includes the study of the electrokinetic behaviour of micro- and nanoparticles in polar and nonpolar colloids. We combine fundamental research with innovative practical applications in fields such as biodetection and electronic ink displays. We approach our research topics from a physics and technology point of view, mainly focusing on single particles, and using methods such as optical tweezers, confocal fluorescence microscopy, sensitive electrical measurements and microfluidics. Cleanroom facilities are available for the technology development. Our group is part of the Center for Nano- and Biophotonics at Ghent University, and collaborates with several industrial and academic partners. We are looking for early stage researchers aiming for a doctoral degree.

### **Profile:**

#### **You are the person we are looking for if:**

- you have a master degree in photonics, physics, applied physics or electronics.
- you have very good study records, and are research oriented.
- you are a motivated, communicative team worker.
- you are aiming towards a doctoral degree (3-4 years).
- there are no limitations regarding nationality (Belgian, European, non-European are all eligible).

#### **We can offer you:**

- A fully paid 4-year PhD position.
- An ambitious and dynamic environment in a successful, international research group.
- Experience in technology, electrical and optical measurements and simulations.
- Contacts and exchange possibilities with international academic and industrial partners.

Send your CV and motivation letter to:

Filip Strubbe or Kristiaan Neyts

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