

**Job Title**

Postdoctoral Fellow

**Last application date**

July 21<sup>st</sup>, 2024, 00:00

**Department**

WE06 - Department of Chemistry, Faculty of Sciences

**Contract**

Limited duration, max. 3 years, Bursary position.

**Degree**

PhD in Physics/Applied Physics/Physical Chemistry or similar, awarded before Oct. 1<sup>st</sup> 2024

**Occupancy rate**

100%

**Vacancy type**

Research staff

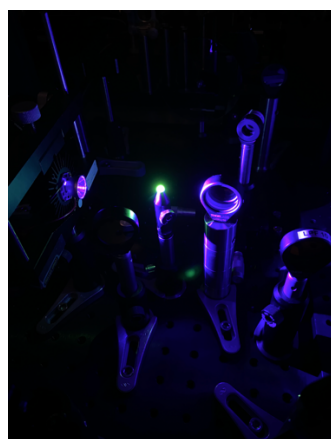
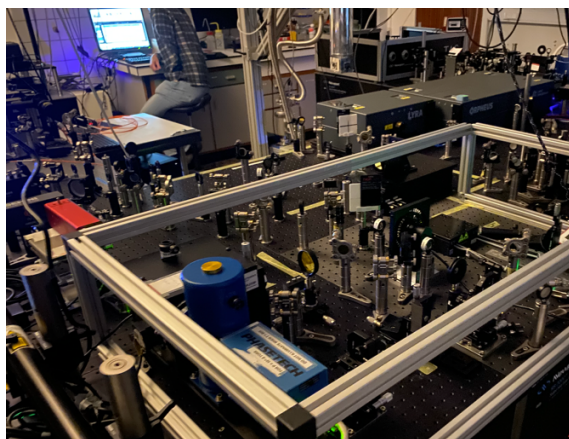
**Job Description.**

At Ghent University, Belgium, we invest in printed opto-electronics based on solution processable colloidal semiconductor quantum dots (QDs) ([www.nano.ugent.be](http://www.nano.ugent.be)). These materials can make available a much-needed small footprint, low cost and flexible platform for optical sensing, imaging and spectroscopy in the technologically relevant short and mid-wave infrared (IR) spectrum (1.5  $\mu\text{m}$  – 5  $\mu\text{m}$ ). However, while this revolution took place in the visible spectrum, and is happening at the side of detectors for infrared light, QD-based IR light source technology is currently expensive, lacking performance and is based on colloidal nanomaterials made of restricted chemical elements.

We will therefore explore a route towards '*printable IR opto-electronics*' by investing in three interconnected scientific domains: chemistry, photo-physics and integrated photonics. In particular, your job will be to **develop ultrafast infrared optical spectroscopy tools** to look at electronic and vibrational dynamics in nano-structured materials with infrared optical transitions, such as quantum dots, to understand how excitons and vibrations interact on the nanoscale on ultrafast timescales. To this end, we are currently developing 1D narrowband pump-probe spectroscopy in the infrared (1500 – 12.000 nm) spectrum. It will be your challenge to push the limits of this setup by developing :

- (i) A femtosecond infrared continuum usable as infrared probe light through gas filamentation.
- (ii) Implement it in 1D ultra-broadband spectroscopy.
- (iii) Use it as a probe for 2D-IR spectroscopy of hybrid organic-inorganic materials..

Once set up, you will be able to test this advanced setup on several new and exploratory materials under development in the group. Next to this, your job will be to head the spectroscopic efforts within the team and become a cornerstone of the Core Facility for advanced laser spectroscopy, NOLIMITS ([www.nolimits.ugent.be](http://www.nolimits.ugent.be)). You will be part of a team of > 10 people in total, including – apart from several spectroscopists – also chemists and engineers.



### **Job Profile.**

You will work on expanding the current ultrafast spectroscopy lab, which today consists of a well-equipped, climatized facility with pump sources and OPA's stretching from the UV/VIS to the IR. In particular, this will involve continuum infrared generation through filamentation, implementing it for 1D pump-probe and eventually 2D-infrared methods. To meet such a challenge, we are looking for a highly motivated and skilled researcher with a strong background in pulsed laser spectroscopy (PhD in Physics or Physical Chemistry, or related field), in particular :

- Experience with time-resolved pump-probe spectroscopy, either in the visible but preferably in the infrared spectrum, at the level of building such setups, and their implementation in scientific research related to exciton dynamics and/or vibrational spectroscopy.
- Knowhow of non-linear optics and pulsed lasers.
- Experience with multi-dimensional spectroscopy is a plus.
- Good programming skills in Python or similar language.
- A good knowledge of English (oral and written) is a must.
- You work independently, have a strong feeling of responsibility and can commit to timing and milestones set forward in mutual agreement.
- As a post-doc you will have the opportunity to take up a mentoring role for other students in the group and develop your own ideas.

### **How to Apply**

Send your application (see below) to [Pieter.geiregat@ugent.be](mailto:Pieter.geiregat@ugent.be) with the heading "*Application Post-Doc\_Last name\_First name*" no later than August 15<sup>th</sup>.

For the application itself :

- **Check the requirements** and job descriptions thoroughly, only relevant profiles will be contacted for an interview !
- Provide a clear **CV & Bsc/MSc transcripts** with grading.
- Provide a comprehensive CV and please highlight and explain your role in any projects or papers you list.
- A **motivation letter related to this application**, and why you are interested a Post-Doc in general.
- **PhD** thesis text, or a link to download it.
- **3 relevant references** (both academic and non-academic are allowed) which can be contacted, with a statement as to why they are relevant, and your relationship to them.

### **Application Deadline.**

July 21<sup>st</sup>, 2024.

Short-listed applicants will be contacted for interview shortly after before end of August.