



Institute of Physics of the Polish Academy of Sciences

Scholarship for a PhD Student



Job ID: #JOB 20/2022

Job Description

Job Title: PhD student – scholarship holder

Job Summary:

Fluorescence of single I-III-VI colloidal nanocrystals (experimental)

Job Description:

Single nano-objects are particular light emitters — they emit single photons one by one. The resulting photon stream carries information on the quantum nature of the emitter and about its interaction with the environment. The successful candidate will investigate single semiconducting nanocrystals belonging to the group of ternary I-III-VI compounds such as CuInS₂. This family of nanostructures constitute a more environmentally friendly alternative to the better known cadmium and lead chalcogenides. However, the mechanism of light emission in these ternary nanocrystals is still a subject of a debate.

The aim of the work is to understand the process of light emission in I-III-VI nanocrystals and develop procedures to tailor the fluorescence properties toward specific applications. The candidate will employ state of the art spectroscopic techniques to study exciton recombination dynamics, multiexciton generation, and carrier trapping by surface states. To determine the impact of nanocrystal architecture on the optical properties, they will investigate fluorescence dynamics, spectral diffusion, and photon correlations on a single particle level. The experiments will be carried out in custom-built setups and the candidate will participate in aligning it. They will develop tools for advanced data analysis. They will take part in nanocrystal synthesis, sample design and preparation for experiments. They will also conduct ensemble level optical characterization studies. The successful candidate will join a young group of researchers working on various nanostructure systems with a view of applications ranging from optoelectronics to nanomedicine.

Requirements:

- Master's degree (or equivalent) in physics, chemistry, or related field
- Experience with optical spectroscopy
- Experience with data analysis tools
- Proficiency in English
- Excellent team work
- To be employed, the candidate must be accepted into the PhD school in which the Institute of Physics participates. Applications for the position are through recruitment to the School, online at warsaw4phd.eu.

Main research field: Physics

Sub Research Field: chemical physics

Career Stage: Early stage researcher or 0-4 yrs (Post-graduate)

Research Profile ([details](#)): First Stage Researcher (R1)

Type of Contract: Fixed term (12 months)

Status: Full-time

Salary: grant funding of **4000** PLN per month, before subtracting obligatory employer and employee social security contributions (~15%).

Contact

More information can be obtained from

Łukasz Kłopotowski (e-mail: lukasz.klopotoski@ifpan.edu.pl)

<http://klopotoski.com/physics>

Please make contact.

Application details

Application deadline: 04.06.2022 Later applications will not be considered.

Required materials:

- Scientific CV
- Cover letter
- Scan of MsC diploma or equivalent (or an explanation of when one is expected)
- Academic record (for finalized semesters)
- Recommended: A recommendation letter by an academic, or their contact email.

All materials should be submitted in electronic form by application to the PhD school warsaw4phd.eu, choosing the project: "*Fluorescence of single I-III-VI colloidal nanocrystals (experimental)*". The application system will be active from 21 May 2022. Results regarding the position will be made available by 6 July 2022.