Job posting

Type of position
☒ scientific
☐ administrative

Target group
☒ graduates
☐ post docs
☐ other

Title
1 PhD in Low dimensional physics and 1 PhD in ultrafast physics (m/f/d) (Salary level E13 TV-L 65%)

Institution
School of Physics - Department of Mathematics/Informatics/Physics – Osnabrueck University & CellNanOs

Position
The research groups “Physics of low dimensional materials” (Dr. Laura Vittadello) and “Ultrafast Physics” (Prof. Mirco Imlau) are seeking to appoint 2 PhD positions. The research assistants are included in the recently founded interdisciplinary graduate school “nanomaterials@biomembranes” (DFG, RTG 2900-1).
In the overall project, 12 PhD candidates belonging to physics, chemistry and biology will contribute with individual projects to one overarching goal: the design, characterization and understanding of photo-functional nanosystems to enable cellular interrogation at the molecular scale - so far missing in life sciences.

The research assistant working with Dr. Laura Vittadello will focus on laser-induced energy transfer from nanoparticles to chemical compounds and/or cells with the goal to manipulate the plasma membrane functions.

Via this topic you will:
- Learn how to tailor colour and intensity of pulsed lasers in a microscope to interact in a non destructive way with nanoparticles, cells and chemical compounds.
- Transfer the knowledge of surface functionalization to polar surfaces and study its impact on the laser-induced energy transfer.
- Explore optical approaches to the photo-release of chemical compounds attached to nanoparticles in function of dimension, shape & defects, but also synthesis methods.
- Implement an optical tweezer to control the movement of the developed nanoparticles using femtosecond laser pulses.

The research assistant working with Prof. Mirco Imlau will focus on the tailoring of femtosecond pulse trains and signal detection techniques to enhance energy transfer of upconversion nanoparticles for interrogation and photomanipulation at single molecular level.

Via this topic you will:
Learn about the interplay between femtosecond pulse exposure, optical features of microscopic systems and samples, and digital signal detection in imaging systems.

Reveal insight to the relation between pulse-induced energy flow and defect architecture (size, shape, doping concentration, core/shell-ratio, host material, etc.) of core-shell nanoparticles.

Study the enhancement of nanoparticle emission by combining tailored fs-pulse trains with coincidence and correlation detection techniques.

Contribute with your results to the nanoparticle synthesis, surface functionalization, and application in plasma membranes.

Responsibilities

- Participate in the DFG-funded research project “Energy transfer from nanoparticle architectures for sub-diffraction photomanipulation” (Vittadello) or “Enhancement of the ucLRET: parametric tuning of femtosecond pulse trains, image coincidence detection and digital image correlation” (Imlau) of the RTG 2900 “Rationally designed surface architectures for nanoscale interrogation and manipulation of biomolecules at membranes”.
- Supervise bachelor and master students (in your 2nd or 3rd year).
- Work & communicate in an interdisciplinary team, write research articles and present your results at national and international conferences.
- Participate in the development of hybrid thinking and related workshops of the research training group.

Requirements

- Completed master’s degree (M.Sc.) in physics or physics/chemistry, or related fields of study
- Interest in interdisciplinary research
- Ability to work in a team and willingness to engage in multilateral research cooperation
- Written and spoken English skills
- Goal oriented and structured way of working

Application procedure (deadline etc.)

Please submit your application indicating the desired project with the following documents: curriculum vitae, certificates incl. transcripts of records, letter of motivation and your application profile (PDF, 97 kB), in electronic form to Prof. Imlau, by December 13, 2023, Email: RTG2900@uni-osnabrueck.de.

Link to the call: https://www.uni-osnabrueck.de/universitaet/stellenangebote/wissenschaftliches-personal/
If you have any questions please do not hesitate to contact Dr. Laura Vittadello (laura.vittadello@uos.de) and/or Dr. Mirco Imlau (mirco.imlau@uos.de). We are very much looking forward to receiving your application.

Useful website
1) https://www.ufp.uni-osnabrueck.de/en/home.html
2) https://www.physik.uni-osnabrueck.de/forschung/forschungsgruppen/arbeitsgruppe_vittadello.html
3) https://www.cellnanos.uni-osnabrueck.de/en/home.html