

PhD student in quantum optics: optical micro-resonators

Job Information

Organisation/Company

University of Latvia, Institute of Atomic Physics and Spectroscopy

Research Field

Physics » Optics

Researcher Profile

First Stage Researcher (R1)

Country

Latvia

Application Deadline

08 May 2023

Type of Contract

Temporary

Job Status

Full-time

Offer Starting Date

1 Sep 2023

Offer Description

The Latvian Quantum initiative (LQI) is a partnership between leading academic institutions in Latvia recognized for research excellence in specific domains of quantum technologies. The initiative has been granted dedicated funding for development of research potential in quantum technologies, leveraging synergies between participating labs.

Quantum Optics laboratory of the Institute of Atomic Physics and Spectroscopy, lead by Prof. Janis Alnis (currently 6 people) traditionally focused on precise measurements of light frequencies for optical frequency standards (optical clocks) probing atomic resonances with laser stabilised to a high-finesse optical resonator characterised by a femtosecond optical frequency comb up to 14 digits of precision. Also environmental monitoring of air pollutant gases with laser spectroscopy.

The current research in our laboratory is on optical microresonators, the so-called „whispering gallery mode” resonators (WGMR) that have high optical quality Q-factors not requiring any mirror coating and can be produced in house by melting silica microspheres. These resonators are functionalized with polymers for gas sensing and nanoparticles for applications as biosensors. Within the LQI project the PhD student will work on advancing the subject to make micro-ring resonators on chip in the cleanroom facility of the Institute of Solid State Physics <https://www.cfi.lu.lv/en/research/nanotechnology-center/> and develop models using Comsol.

The second direction we currently pursue is WGMRs for microresonator optical frequency comb generation by the optical Kerr effect. This Kerr-comb allows to generate many optical carriers from a single pump laser, and together with the Institute of Telecommunications the PhD student will work on improving Kerr-comb for telecommunication data transfer. The

applicant will investigate the microresonator surface functionalization with quantum dots to increase the efficiency of nonlinear effects.

Requirements

Research Field

Physics » Optics

Education Level

Master Degree or equivalent

Skills/Qualifications

Experience with optics and lasers, electronics, experimental measurements.

Specific Requirements

The applicant will perform mainly experimental research on optical microresonators, present the work at conferences and prepare publications with a goal to obtain a PhD degree in Physics from the University of Latvia.

Additional Information

Competitive salary *starting from* 2000 EUR/month and social benefits.

Work Location

Number of offers available

1

Company/Institute

University of Latvia, Institute of Atomic Physics and Spectroscopy

Country

Latvia

State/Province

Riga

Postal Code

LV-1004

Street

Jelgavas iela 3

Where to apply

E-mail

quantumlatvia@lu.lv

Please include reference "PhD student - optical micro-resonators" in your application e-mail.