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Director of Centre of New Technologies of the University of Warsaw, with the Project Leader, announce opening of the competition for the position of Student in the Laboratory of Quantum Optical Devices Lab (QODL) – Centre of New Technologies of the University of Warsaw.

SCHOLARSHIP OFFER

Position in the project:	Student
Laboratory	Laboratory of Quantum Optical Devices Lab (QODL)
Keywords:	quantum optics, Rydberg atoms
Scientific discipline:	Physics
Job type (employment contract/stipend):	Stipend
Number of job offers:	6
Remuneration/stipend amount/month	1000 - 2500 PLN gross gross/month depending on level of involvement
Position starts on:	01.05.2025 or as soon as possible after this date
Maximum period of contract/stipend agreement:	42 months
Institution:	Centre of New Technologies, University of Warsaw
Project leader:	Michał Parniak-Niedojadło
Project title:	Three-dimensional Rydberg polaritonics in the quantum regime
NCN programme:	OPUS 27
Project description:	<p>Polaritons are hybrid quasi-particles formed by the coupling of material excitations and optical photons, occurring in both condensed matter and atomic systems. While interactions between polaritons are inherent in condensed matter, they can be precisely controlled in atomic systems using external fields, atomic level selection, and optical addressing. Of particular interest are Rydberg polaritons, which enable strong photon-photon interactions and have been explored mostly in 0D or 1D systems. Our project aims to study Rydberg polariton interactions in two and three dimensions, allowing for greater control over dispersion relations and the emergence of novel bound states. This research will open new avenues in polaritonic many-body physics, including the potential observation of an Efimov state of three polaritons.</p>



The project will be conducted in the Centre for Quantum Optical Technologies. Group website: <https://www.qodl.eu/>

Key responsibilities include:

Responsibilities will be selected from the list below based on candidate's qualifications.

1. Experimental implementation in the lab
2. planning & building optical setups
3. aligning beams, calibration, and optimization
4. taking measurements
5. data analysis
6. designing new experiments
7. theoretical analysis and consultation with theory collaborators
8. writing acquisition, and analysis software
9. presentation of results at conferences
10. participation in writing publications
11. theoretical calculations and simulations and participation in experiments: simulating the propagation of light under EIT conditions
12. simulating multilevel atomic structures
13. verification of theoretical models using experimental data analysis
14. estimation of fundamental bounds limiting formation of Rydberg polaritonic molecules

Profile of candidates/requirements:

The competition is open for persons who meet the conditions specified in the regulations on the allocation of resources for the implementation of tasks financed by the National Science Centre for (OPUS 27) grant.

Being enrolled as a student of first cycle studies, second cycle studies, uniform Master's studies or having a confirmed status of a PhD student (on the date of starting work in the project at the latest) in a higher education institution on the territory of Poland, in physics or related discipline.

Depending on targeted tasks, we require skills in working with optical and electronic equipment, or theory skills in atomic and optical simulations.

Experience in at least one of the fields: optical physics/photonics, electronics, python or other scripting language, labview, mathematica, commensurate with the education level of the candidate.

University of Warsaw strongly values the diversity of candidates and is very committed to the equality of opportunity.



Required documents:	<ol style="list-style-type: none">1. Curriculum vitae with research records2. Academic transcript3. Contact details of at least one senior researcher familiar with candidate's work4. Copy of document confirming the student or PhD student status5. Signed information on the personal data processing.6. Before entering the competition, candidates are obliged to familiarise themselves with Internal Reporting Procedure.7. Optionally: report or other documentation concerning electronics or programming or optical projects or other physics completed so far.8. Fill in the form at https://forms.gle/6wtUZ56uz6f6NuWy7
We offer:	Participation in an exciting research program conducted within a newly established centre with high scientific expectations and goals. An open and friendly research environment with access to all the facilities available within the Centre of New Technologies (CENT)—an interdisciplinary research institute established within the University of Warsaw to gather international researchers of different backgrounds and experience, in order to conduct state-of-the-art research in biological, chemical and physical science: http://cent.uw.edu.pl/en/ .
Please submit the following documents to:	Please send the application via email to got-job@cent.uw.edu.pl with “[OPUS students]” in the title.
Application deadline:	9 April 2025
NCN programme	OPUS 27
Date of announcing the results:	14 April 2025
Method of notification about the results:	e-mail, CeNT website: https://cent.uw.edu.pl/en/career/