

# **Center for Theoretical Physics Polish Academy of Sciences**





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**REGON: 000844815** 



	Warsaw, 2025-05-08
INSTITUTION Center for Theoretical Physics, Polish Academy of Science	es
CITY Warsaw	
POSITION PhD Student fellowship positions	
DISCIPLINE physics	
POSTED2025-05-08	
EXPIRES2025-06-01	
WEBSITE www.cft.edu.pl	
KEY WORDS:	
DESCRIPTION (field, expectations, comments):	
Bose-Finstein condensate microcanonical ensemble gas cooling	

# Two PhD Student fellowship positions at Center for Theoretical Physics PAS

The Director of the Center for Theoretical Physics PAS invites applications for 2 PhD Student fellowships at the CTP PAS, financed from the project OPUS 27 "Real-world statistics of ultracold gases and their consequences" funded by the National Science Center (grant agreement number: UMO-2024/53/B/ST2/02161).

The PI of the project is dr hab. Krzysztof Pawłowski, Prof. of CTP PAS.

The aim of the project is to verify the hypothesis of the equivalence of statistical ensembles in the case of interacting systems.

Tasks of the first PhD student who wins this competition:



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- Study of the (non-)equivalence of statistical ensembles in the case of interacting systems.
- Analysis of a 1-dimensional system in the Lieb-Liniger and Yang-Yang models.
- Application of mathematical physics methods dedicated to the Lieb-Liniger model.
- Calculation of Bose-Einstein condensate fluctuations.
- Design of quantum "engines".

## Tasks of the second PhD student who wins this competition:

- Conduct research within the framework of quantum mechanics of open systems.
- Create a realistic model of gas cooling at ultra-low temperatures.
- Compare with experimental results.
- Collaborate with the experimental group of Jan Arlt.
- Perform numerical calculations, including comparison of correlation functions of a thermal gas modeled within different statistical ensembles.
- Consequences of statistics on quantum interferometry.

## The scope of work of the first successful Candidate within the project will include:

developing further the analysis of ensembles and relations between them using ready software available in the group. Analytical calculations (1D case) for the distributions, for the correlation functions and finally on the general metrological scheme.

## The scope of work of the second successful Candidate within the project will include:

extending codes for the stochastic wave approach, analyzing the resulting statistical ensembles and probability distributions, conducting numerical analysis of correlation functions, completing an internship at Aarhus University and analyzing experimental data, and implementing software to analyze time-of-flight images. Writing drafts of publications. Dissemination and communication.

# We expect the candidates to have:

- Experience in conducting scientific research.
- Knowledge in the field of statistical mechanics.
- Knowledge in the field of many-body systems.
- Ability to carry out analytical reasoning.
- Passion for science.

## The application must include:



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1. The scientific CV, including the progress in the university studies, scientific achievements (publications, participation in research projects and conferences), with the clause "I agree to the processing of my personal data contained in the application documents for the purposes necessary for the implementation of the process recruitment by the doctoral school WARSAW-4-PhD".

- 2. Cover letter.
- 3. A copy of the master's degree diploma, or a statement from the Candidate's MSc Advisor about the planned date of diploma obtaining
- 4. Copies of documents confirming scientific or professional achievements.
- 5. At least one letter of recommendation from a researcher with at least a PhD degree, concerning the candidate and his/her current scientific activity.
- 6. Application for admission to the WARSAW-4-PhD doctoral school (Attachment No. 1).

Documents should be submitted electronically via the recruitment system on the website <a href="www.war-saw4phd.eu">www.war-saw4phd.eu</a> from 19.05.2025 to 01.06.2025.

The scholarships will be awarded in accordance with the applicable laws in Poland and in accordance with the Resolution of the National Science Center Council - Annex No 25/2024 of 4 March 2024 (which can be found here:

https://ncn.gov.pl/sites/default/files/pliki/uchwaly-rady/2024/uchwala25\_2024-zal1\_ang.pdf) , in the amount of 4 700 PLN net for a period of 4 years, with the first 43 months being funded as part of the research project OPUS 27 no. UMO-2024/53/B/ST2/02161, and the subsequent 5 months, being funded from other sources.

The competition will be settled by 25.07.2025. Candidates will be informed electronically on the results of the competition. Admission to the WARSAW-4-PhD Doctoral School and the beginning of the scholarship are scheduled for 01.10.2025.

Additional questions can be sent to: <u>pawlowski@cft.edu.pl</u>



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#### Information Clause – Job Recruitment

Information Obligation under the Article 13 of the RODO \*:

#### 1. Data Administrator

The administrator who is a deciding entity on how your personal data will be used is the Center for Theoretical Physics PAN represented by the Director with the seat in Warsaw Al. Lotników 32/46. You can contact the Administrator by using one of the contact forms available on the website: http://www.cft.edu.pl/

#### 2. Data Protection Inspector

The Director of the Center for Theoretical Physics of the Polish Academy of Sciences has appointed the Data Protection Inspector (Inspektor Ochrony Danych - IOD) with whom you can contact in all matters relating to your personal data. You can contact the Inspector by sending an email to: <a href="mailto:iod@cft.edu.pl">iod@cft.edu.pl</a>

#### 3. The Purposes of Processing and the Legal Basis for Processing

Your personal data will be processed for the purpose of running the current recruitment.

The basis for the processing of personal data are the provisions of the Labor Code Act of June 26, 1974 (uniform text: Dz. U. of 2018, item 917) and based on your consent for data processing.

#### 4. The Period of Storage of Personal Data

Your personal data will be kept for the duration of the present recruitment.

#### 5. Data Recipients\*\*

The recipients of your personal data will be only entities authorized to obtain personal data on the basis of the law. Access to your data is provided only to employees authorized by the administrator and associates who must have access to the data to perform their duties.

#### 6. Your Processing Rights

You have the right to access your data and the right to correct it or limit processing, as well as the right to appeal against the processing.

#### 6. The Obligation to Provide Data and the Consequences of not Providing Data

Providing your personal data specified in the Labor Code is obligatory, and for the remaining extent voluntary.

7. The right to make a complaint to the President of the Office for the Protection of Personal Data

When you feel that the processing of personal data violates the provisions of the general regulation on the protection of personal data you have the right to make a complaint to the President of the Office for the Protection of Personal Data.

# Consent to Data Processing I consent to the processing of my personal data by the Center for Theoretical Physics PAN for the needs of: Present recruitment. I provide the data voluntarily and I declare that they are truthful. I got acquainted with the contents of the above information, including information about the purpose and methods of processing personal data and the right to access my data and the right to correct them.

date, signature of the candidate

* Regulation (FII)	2016/679 of the 1	Furonean Parliame	nt and of the Counc	il of 27 April 2016	on the protection of	of individuals with i	egard to the
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