



Institute of Physics of the Polish Academy of Sciences Scholarship for a PhD Student



Job ID: #JOB 57/2022

Job Description

Job Title: PhD student – scholarship holder

Job Summary:

Ultracold but nonzero temperature one-dimensional Bose gases

Job Description:

The physics of one-dimensional Bose gases has taken a prominent role in the field of ultracold atoms and various quantum technology applications in the last decade. Thus the 1d Bose gas is a topic of much modern research interest. In reduced spatial dimensions, where the particles cannot avoid collisions with each other, the interparticle interactions play an especially large role in the description of system, and in producing collective phenomena which are very different from typical superfluids.

The supervisor of the project has recently developed a number of novel approaches to describe these gases. In particular, for strongly interacting integrable gases, a form factor hierarchy has been developed that allows one to systematically find the leading contributions to excitations in the Bethe ansatz. This opens a route to study correlations for larger numbers of strongly interacting particles and at nonzero temperature.

We will research together novel nonzero temperature behaviour both in the strong and weak interaction regimes using the above new approaches. Targets include, among others, understanding the contributions to phase coherence and the Tan's contact in strongly interacting gases. An aim is for the PhD student to gain in-depth understanding of the physics and research methods of both strong and weak interacting low-dimensional quantum systems.

Requirements:

- Research experience in theoretical physics.
- Good programming skills or a strong willingness to learn them quickly.
- Experience with ultracold gases, quantum optics, or quantum physics theory will be a strong advantage, as will experience with numerical calculations.
- Master's degree in physics (or an equivalent that qualifies one for PhD studies in physics in the country of issue).
- Sufficient proficiency in the English language for efficient scientific interaction.
- 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: ultracold quantum gases, integrable systems

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

Research Profile (details): First Stage Researcher (R1)

Type of Contract: Fixed term (18 months)

Status: Full-time

Salary: grant funding of **5000** PLN per month, before subtracting obligatory employer and employee social security contributions (~15%).

Contact

More information can be obtained from

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<http://www.ifpan.edu.pl/~deuar/>

Please make contact.

Application details

Application deadline: 04.01.2023 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:

"Ultracold but nonzero temperature one-dimensional Bose gases".

The application system will be active from 21 December 2022.

Results regarding the position will be made available by 11 February 2023.