



C4QEC

CENTER FOR
QUANTUM-ENABLED
COMPUTING



HR EXCELLENCE IN RESEARCH

PhD Student – Research assistant in Quantum Computational Advantage (f/m/x)

Ref. Number: MAB/12/2026

Location: Warsaw, Poland

Salary: 9 600 PLN/month gross (employment contract: 1 FTE; full social security and health insurance)

Number of positions available: 1

Work Arrangement: Hybrid

Position available as soon as possible and runs until the end of 2029.

Keywords: quantum information, quantum computing, mathematical physics, quantum computational advantage, quantum computing with indistinguishable particles

Important Dates:

1. Application deadline: 15.06.2026.
2. Candidates will be informed about the results by the end of July.

Source of financing: Center for Quantum-Enabled Computing / Centrum Obliczeń Wspomaganych Kwantowo (FENG.02.01-IP.05-M032/25). The project is carried out within the International Research Agendas programme of the Foundation for Polish Science co-financed by the European Union under the European Funds for Smart Economy 2021-2027 (FENG).

About the project and us

The *Center for Quantum-Enabled Computing* project's overarching objective is to address several key challenges in the field of computing by paving the way to a verifiable, energy-efficient, reliable, and scalable computational advantage based on quantum systems.

Project's website: <http://c4qec.cft.edu.pl>

Successful candidates will join the Quantum Computational Advantage group led by prof. Michał Oszmaniec. The research activity of the group is centered on the three goals:

- (i) **Randomized implementation of quantum operations and circuits.** Developing methods for realizing complex quantum computations through randomized combinations of simpler, smaller, or noisier circuits. The aim is to reduce hardware requirements and improve the performance of near-term quantum devices, with applications to error mitigation, and circuit cutting for specific algorithmic primitives relevant to concrete applications.



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(ii) **Verification of quantum advantage on realistic hardware.** Designing certification and benchmarking protocols for sampling-based quantum advantage experiments, with emphasis on Boson Sampling and Fermion Sampling. We will target implementations on current and near-term platforms, including superconducting qubits, trapped ions, Rydberg atoms, and photonic processors, while accounting for realistic imperfections in these platforms.

(iii) **Applications and limitations of quantum advantage schemes.** Exploring whether quantum advantage protocols can be turned into useful computational or cryptographic primitives, including certified randomness generation, generative machine learning, and quantum chemistry. We will also investigate whether proposed quantum advantages can be “dequantized”, leading to improved classical algorithms inspired by quantum protocols.

The Center for Quantum-Enabled Computing is a part of the [Center for Theoretical Physics of the Polish Academy of Sciences \(CFT PAN\)](#) which is a research institute that conducts research in various fields of physics, including quantum information, research on the cosmos and gravitation, semiconductors, and atomic gases. The Institute’s strategy is to employ the strongest scientists while giving them freedom in conducting research. The result is the high position of CTP PAS PAN in Poland, publications at a world-class level (papers in Nature and Science), a large number of grants (more than 30 projects), and participation in international consortia.

The CTP PAS also hosts a number of scientific events, including seminars, workshops, and conferences, which are open to the public. The Institute also creates educational content accessible on its official [YouTube](#) channel.

About the role

We are seeking a PhD candidate who will join the newly established Center for Quantum-Enabled Computing (within the structures of the [Center for Theoretical Physics of the Polish Academy of Sciences](#)) — the first scientific unit in Poland dedicated to the application of quantum effects in computing.

Your responsibilities will include:

- Implementation of the research tasks outlined in the proposal, as well as other tasks assigned by the project leader, using both analytical and numerical methods.
- Preparation of a PhD thesis based on the results obtained within the project.
- Dissemination of results (including writing scientific articles and active participation in conferences and workshops).
- Participation in the scientific life of the institute, including the Institute’s Colloquium and C4QEC seminars.

About you



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Required qualifications, experience, and knowledge:

- **Master's degree (or equivalent) in physics or mathematics**; if not yet awarded, a supervisor's statement confirming the planned defense date is required.
- **Very good command of English.**
- **Very good knowledge of quantum physics.**
- **Familiarity with the basic concepts of quantum computing and quantum information theory.**
- **Familiarity with the advanced mathematical methods of quantum mechanics (e.g. representation theory of Lie groups and Lie algebras, functional analysis, concentration of measure) will be considered an asset.**
- **Research experience in the field of quantum information will be considered an asset.**
- **Strong motivation for scientific research.**
- **Good programming skills.**
- **Motivation and willingness** to work in an interdisciplinary team.

What we offer

- Opportunity to develop research skills and do research in a fascinating field in a creative, innovative and friendly work environment.
- Development of analytical and numerical skills in the field of quantum information theory.
- Possible collaboration with top institutes in quantum information theory and related fields (e.g. University of Helsinki, INL in Braga, ICFO in Barcelona)
- Possibility to file patent applications within the project.
- Funds for participation in scientific events (conferences, workshops, etc.) to disseminate project's results, research visits at partner institutions;
- Access to computational resources at CTP PAS.
- Competitive salary: **9 600 PLN/month gross**. The indicated amount includes the seniority allowance and constitutes the Employee's base remuneration. The remuneration is determined and paid in accordance with the Remuneration Regulations in force at the Institute.
- Flexible working hours.
- A diverse and inclusive culture in which mutual support, teamwork, and respect are highly valued.
- Subsidy for a Multisport card.
- Subsidy for leisure activities.
- Subsidy for nurseries and kindergartens.

How to apply

Applications should be sent to: recruitment@cft.edu.pl, by **15.06.2026**, with the reference number ("**MAB/12/2026**") in the subject line.



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Required documents:

1. **Curriculum Vitae** detailing scientific achievements (publications, conferences, prizes and awards etc.)
2. **Transcripts of records** from both Bachelor's and Master's studies.
3. **At least one recommendation letter** provided by a senior researcher or an academic staff member evaluating the candidate's research skills and their previous research activity.
The letters are to be sent directly to recruitment@cft.edu.pl; the candidate is responsible for arranging for the letters to be submitted.
4. **A short cover letter** explaining the motivation for doing research in this field.
5. **Copy of Master's diploma** (or equivalent), if not yet awarded, a supervisor's statement confirming the planned defense date is required and the Master's diploma must be obtained before the employment contract is signed.
6. **Signed Data Privacy Statement** ([EN + PL - GDPR clause](#)).

Only shortlisted candidates will be contacted.

Shortlisted candidates will receive an invitation for an interview which will be held at the Center or online.

How we recruit

We carefully review every submitted application. Those whose experience and competencies align with our needs and requirements are invited to an interview (usually held online).

We stay in touch with candidates throughout the entire process, ensuring that interviews take place in a friendly atmosphere, and providing feedback after the interviews. We approach each candidate individually, also considering the needs of people with disabilities.

We appreciate all feedback received after the recruitment process. It motivates us to improve our recruitment efforts.

Our commitment to Equality, Diversity and Inclusion

The CTP PAS operates in an all-inclusive environment irrespective of personal, physical, or social characteristics. Teamwork is highly valued, individual strengths are recognised and appreciated, and we are committed to advancing the careers of everyone.

Equality, respect, and openness are fundamental values in an academic environment, where diversity is essential. We strive to provide a safe and inclusive space for everyone who is part of our scientific community.

The CTP PAS has regulations for reporting violations of law and protection of whistleblowers.

