Postdoctoral researcher in Computational Advantage Group (f/m/x)

Ref. Number: **MAB/14/2026**
Location: Warsaw, Poland
Salary: **12 980–14 660 PLN/month gross** (approx. 9 700 – 11 000 PLN/month net) employment contract: 1 FTE; full social security and health insurance
Number of positions available: 1
Work Arrangement: Hybrid
The position is available as soon as possible, initially for one year, with the possibility of extension until the end of 2029 subject to satisfactory performance.

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 in the first half of July 2026.

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.

(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 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 postdoctoral researcher 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.
- Co-supervision of PhD and undergraduate students employed in the project.
- Dissemination of the obtained results (writing articles, presentations on scientific events).

- Participation in the scientific life of the institute, including the CTP PAS Colloquium and C4QEC seminar.

About you

Required qualifications, experience, and knowledge:

- **PhD degree in physics** (or a related discipline relevant to the research agenda); if not yet awarded, a supervisor's statement confirming the planned defense date is required.

  The PhD must have been obtained no earlier than 2021.
- **Very good command of English.**
- **Very good knowledge of quantum physics, quantum information/ quantum computing and related fields.**
- **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.**
- **Motivation and willingness** to work in an interdisciplinary team.
- **Openness to internal and external collaborations**, including international networking.
- **Experience in supervising students** will be considered an asset.

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: **12 980–14 660 PLN** gross per month (approx. 9 700 – 11 000 PLN/month net). The indicated amount includes the seniority allowance. 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/14/2026")** in the subject line.

Required documents:

1. **Curriculum Vitae** including the course of studies and possible scientific achievements (publications, participation in research projects, conferences, etc.).
2. **At least one recommendation letter** about the candidate's past achievements and research potential written by senior researcher to be sent directly recruitment@cft.edu.pl.

   The candidate is responsible for arranging for the letter to be submitted.
3. **Cover letter/motivation letter** with a brief description of the Candidate's scientific interests.
4. Copy of **PhD degree in physics** (or a related discipline relevant to the research agenda); if not yet awarded, a supervisor's statement confirming the planned defense date is required and the PhD must be obtained before the employment contract is signed.

   The PhD must have been obtained no earlier than 2021 (i.e., within the last five years). This five-year period may be extended by all documented interruptions in academic work occurring after the PhD award date, provided that each interruption lasted at least six months. Documented interruptions may include, among others, unpaid leave, parental leave, long-term illness, employment in the R&D sector without involvement in scientific research, or employment outside the research sector. For women who have given birth to a child, and for individuals who have adopted a child, the five-year period is extended by one additional year for each child, regardless of the date of birth or adoption, even if the documented leave or interruption was shorter.
5. **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.