

Institute of Physics of the Polish Academy of Sciences

Scholarship for a PhD Student

Job ID: #JOB 111/2023



Job Description

Job Title: PhD student – scholarship holder



Job Summary:

Quantum gates with hybrid topological-conventional qubits

Job Description:

Topology has found a route from purely mathematical concepts to physics applications. The discovery of the quantum spin Hall effect and topological insulators more than a decade ago has revolutionized modern condensed matter physics. One of the most exciting applications is topological quantum computation with topological qubits such as the Majorana fermions emerging as excitations in topological superconductors. It is thus of great importance to investigate the dynamics of these excitations and beyond in the presence of the surrounding environments, such as photons or magnons. In the project, the PhD will investigate theoretically the interplay between the geometry and/or topology of the braiding trajectories and the environmental degrees of freedom. The PhD will also exploit such effects to construct long-range quantum gates between topological qubits and conventional qubits, such as hole-spins in semiconductor nanostructures, and possibly simulating them on the IBM quantum devices.

Requirements:

- Experience using Mathematica, Python, etc
- Proficiency in English
- Master's degree in theoretical physics (or an equivalent that qualifies one for PhD studies in physics in the country of issue).
- The candidate should be a PhD student accepted at a doctoral school in Poland or be a participant in a doctoral programme in Poland at the time of starting work in the project, subsequent payment of scholarship follows NCN rules;

Main research field: Physics

Sub Research Field: Condensed Matter Theory

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

Research Profile ([details](#)): First Stage Researcher (R1)

Type of Contract: Fixed term (14 months with possibility of prolongation)

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 Mircea Trif (e-mail: mtrif@magtop.ifpan.edu.pl)
<https://www.magtop.ifpan.edu.pl/prof-trif-mircea/>

Application details

Application deadline: 02.01.2024. Later applications will be not considered.

Required materials:

- Scientific CV
- Cover letter
- Certificate that at the moment of application a candidate is a participant of a PhD study or a PhD student at Doctoral School in Poland.
- Written permission of the candidate's scientific supervisor together with his/her recommendation
- Consent to process your personal data

All materials should be submitted in electronic form to the address:
rekrutacja@ifpan.edu.pl with Job ID in the subject.

Information clause – scholarship competition

Pursuant to Article 13 paragraphs 1 and 2 of Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of individuals with regard to the processing of personal data and on the free movement of such data and repealing Directive 95/46/EC (General Data Protection Regulation) Official Journal of the European Union, L 119, 4 May 2016, page 1, as amended, hereinafter referred to as “GDPR”, we hereby inform as follows:

1. The Institute of Physics of the Polish Academy of Sciences with its registered office in Warsaw, Al. Lotników 32/46, represented by its Director, is the Controller, i.e. an entity deciding about how your personal data will be used. You may contact the Controller using one of the contact forms available on the website: tel. (22) 116-2111, e-mail: director@ifpan.edu.pl
2. The Director of the Institute of Physics of the Polish Academy of Sciences has appointed the Data Protection Officer (DPO), whom you may contact in matters relating to your personal data, by sending an email to the following address: iodo@ifpan.edu.pl
3. Your personal data will be processed in connection with your participation in the scholarship competition and if you win the competition, in connection with receiving the scholarship – on the basis of your consent – Article 6 paragraph 1 item a GDPR.
4. Your personal data will be processed for a period of 6 months after the end of the scholarship competition and in the case of receiving the scholarship – for a period resulting from legal and tax regulations;
5. Your personal data will be made available to other entities that can finance and settle the scholarship granted and entities authorized under provisions of law. Your data will only be accessed by people authorized by the Controller;
6. Provision of your personal data is mandatory; in the event of failure to do so, you will not be able to participate in the scholarship competition;
7. You have the right to access your data, the right to rectify it and limit processing thereof;
8. You have the right to lodge a complaint to the President of the Office for Personal Data Protection, if you consider that the processing of your personal data violates provisions of the General Data Protection Regulation.

Consent to processing:

I hereby consent to the processing of my personal data contained in the application/request form by the Institute of Physics of the Polish Academy of Sciences to conduct the scholarship competition and in the case of being granted the scholarship, to pay and settle it. I provide my personal data voluntarily and I declare that it is accurate. I have read the content of the information clause.

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Date and signature