

Competition notice

Project title: „Quantum information and communication with high-dimensional encoding – QuICHE”

Principal Investigator: Dr. Michał Karpiński

Project description:

You will carry out research tasks within the international QuICHE project at [Quantum Photonics Lab](#), under the supervision of Dr Michał Karpiński. The project is carried out in an international consortium of Imperial College London, Universities in Dusseldorf, Paderborn, Lille and Pavia, and University of Warsaw, <http://quiche.fuw.edu.pl>. Your tasks will involve experimental or theoretical work on multidimensional processing and distribution of quantum information using optical encoding in time and frequency, which may be partially carried out during research visits at international partner’s research groups.

Requirement

- Master’s degree (or equivalent) in physics or a related field,
- Knowledge of English language to a degree enabling fluent everyday communication in a laboratory setting, reading and writing scientific publications, oral presentation of research results at scientific conferences;
- Experience of working in an optical laboratory,
- Knowledge of topics within nonlinear optics/ quantum optics/ quantum information theory/ quantum key distribution,
- Knowledge of basic software for computer simulations and data analysis (e.g. MATLAB, Wolfram Mathematica).
- Experience in modern numerical modelling methods.
- Publications in high-quality scientific journals, internships in national and/or international research institutions.

Discipline: physical sciences

Admission limit: 1

Recruitment schedule

- registration in the Internet Registration of Candidates, referred to as “IRK”, submitting an application to the IRK: 19.01-04.02.2021
- qualification procedure: 08-10.02.2021
- announcement of the ranking list: until 12.02.2021
- accepting documents from qualified candidates: 15-25.02.2021 until 2 pm
- announcement of the list of accepted candidates: until 26.02.2021
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Recruitment fee

150 PLN

Form of the selection procedure

Evaluation of the following elements shall be taken into account in the selection process:

- 1) the research project proposed by the candidate;
- 2) scientific activity of the candidate based on a CV or resumé, documented with scans of materials attached to the application for admission to the School;
- 3) interview with the candidate;
- 4) other achievements.

Language of the selection process, including the interview

The interview shall be carried out in Polish or English – in accordance with the candidate's preferences presented in IRK. If the Polish language is selected, the interview may include parts in English.

Required documents

The candidate shall submit the application for admission to the School only in IRK. It shall include:

- 1) the application for admission to the Doctoral School;
- 2) scan of a diploma of completion of the long-cycle Master's degree programme in the field of physical or related sciences or second-cycle programme or an equivalent diploma obtained under separate regulations or –in the case of candidates pursuing education within the European Higher Education Areas –a declaration that the diploma or certificate of obtaining a Master's degree shall be provided by 25 February 2021, in the case of holding a diploma equivalent to the diploma of completion of the long-cycle Master's degree programme or second-cycle programme, the candidate shall justify this equivalence;
- 3) a description of the initial research project proposal in English;
- 4) a resumé or curriculum vitae containing information about scientific activities, including scientific interests and scientific achievements during five calendar years preceding the submission of the application, subject to § 18 s. 5, in particular publications, research and organisational work in scientific associations, participation in scientific conferences, participation in research projects, awards, distinctions, research internships, completed training courses on research skills, science popularisation activities, activities in bodies representing scientific societies, professional career;
- 5) scans of materials confirming scientific activities referred to in the resumé or CV;
- 6) a document confirming the command of English at least at B2 level or declaration about the command of English to the extent enabling the education in the school;

- 7) a scan of the declaration of the supervisor candidate about their willingness to be the candidate's supervisor and the number of doctoral students, for whom they are appointed as the supervisor, in accordance with the template determined by the Rector; additionally, the candidate can enclose a scan of the opinion of the supervisor candidate and opinions of other academic staff on the candidate and their scientific activities or the proposed research project;
- 8) one photograph of the candidate's face, allowing their identification;
- 9) declaration whether the candidate is or was a doctoral student or participant of doctoral studies, and if yes – title of doctoral dissertation or the research project prepared by the candidate, as well as first name and surname of the academic tutor or the supervisor;
- 10) declaration on familiarising themselves with the content of the Resolution, as well as Article 40 and Article 41 of the Code of Administrative Procedure;
- 11) scans of transcripts of records of the first and second cycle programmes, the long-cycle Master's degree programme or equivalent documents (e.g. diploma supplement);
- 12) abstract of the master's thesis or draft master's thesis in English (up to 3,000 characters with spaces);
- 13) other documents in form of scans: list of publications and conference presentations

Evaluation criteria

While ranking candidates, following criteria are taken into account:

1. Preliminary evaluation of the research project proposal (0-5 points);
2. Assessment of experience necessary to work in a research project, including scientific achievements (0-35 points) ;
3. Interview (0-60 points)
 - checking the candidate's knowledge and skills in the discipline of Physical Sciences;
 - conversation about the research project, candidate's understanding of the research topic;
 - a series of short questions about the presented scientific achievements and questions about the course of studies;
 - questions pertaining to the other information included in the documentation submitted by the candidate;

Education program

The education lasts 4 years. It includes obligatory classes (no more than 300 hours in total during the whole period of education) and the implementation of an individual research program, carried out under the supervision of a supervisor. Beginning of education - March 1, 2021.

Scholarships

The scholarship is PLN 4500 gross-gross (for the duration of the research project). After its completion, PhD student receives a scholarship in the amount provided for in the general regulations (this year in the amount of PLN 3653,70 gross).