Information about the department

Department: Laboratory of Cryoelectronic Systems.

Head: Sergey V. Shitov, https://scholar.google.ru/citations?user=aCnXGz0AAAAJ&hl=ru

Field of Science: Low temperature physics and engineering, Quantum technologies, Microwave electronics, Quantum sensors, Superconducting detectors

Topic and Content of Research Project No. 1

Title: The studies for signal transduction between the microwave and the optical ranges of electromagnetic irradiation as applied to development of quantum internet.

Head of Research Project: Besedin S. P.

Field of Science: Quantim science and technology. UHF technology. Coherent optics. Low temperature physics and technology.

Working Languages: Russian

Goals and Objectives of Research Project: the ultimate goal of the project is to develop a communication channel to transfer a quantum state between remote qubits operating in the microwave range. The key operation when transferring a quantum state is the transduction of the microwave signal to the optical range and back, since the optical photon whose energy is five order of magnitude higher than that of the microwave one can be transferred over long distance without been corrupted by thermal noise. The present-day issue is to study the mechanisms determining signal transduction at reduced signal levels down to quantum regime.

Description of scientific approaches and methods: the project is based on application of resonance methods using the optical whispering gallery mode resonator. Besides, search for alternative platforms for signal transduction is planned.

Job description:

Tasks and functions in the Research Project: development of the experimental system, carrying out the experiments, data analysis, publication of the results including papers, technical reports, seminar and conference talks.

Salary, position, contract term: 0.5-1.0 of the rate; senior research fellow; 2 year.

Salary: based on interview results.

Postdoc requirements: appreciable knowledge in the fields of UHF physics, condensed matter physics, optics. Experience in building computer controlled optic systems using VISA , Python.

Expected results for the postdoc: significant contribution to the project, resulting in at least one publication in the high-impact international journal.