

General information

Reference: FLNP JINR-PostDoc-2019-08

Workplace : Frank Laboratory of Neutron Physics JINR (FLNP JINR)

Date of publication : November 1st, 2019

Type of Contract : research fellow

Contract Period : 12 – 36 months taking into consideration the results achieved during the 12 months

Expected date of employment : 15 May 2020

Proportion of work : Full time

Remuneration : approximately 30000 USD gross per year payed in rubles. Final amount will be commensurate with qualifications and experience. 13% income tax is applied in accordance with the RF regulations. Social package: see additional information bellow

Desired level of education: PhD

Experience required 2 to 5 years of postdoctoral experience.

Missions

Searching for time reversal invariance violation in neutron induced reactions is a challenging task, which was never realized experimentally, although there are many theoretical predictions of an effect in various combinations of observables. On the other hand, there are many known experiments with neutrons where parity violation has been measured. In order to observe both, T-odd and P-odd effects it is required to use polarized neutrons and/or targets. Moreover, it is usually necessary to be able to polarize neutrons in a wide energy range of the resonance region. It is planned to develop and design such a wide energy polarization facility at FLNP JINR.

Activities

It is planned to develop a new base of cryogenic support for polarization experiments and modernize existing cryogenic facilities at FLNP. The research associate will have to:

- provide scientific support, participate in the development of the method of dynamic polarization of nuclei, new experimental methods for producing polarized neutron beams and creating installations for polarization of targets (cryostats-refrigerators of 3He-4He dilution, operating on the principle of “cryogen-free”);
- be directly involved in these works: placement and adjustment of equipment, performing tests and experiments;
- conduct own research and participate in research projects with external and/or internal users working in the field of polarized neutrons.

Skills

The candidate should have a PhD degree or equivalent, preferably in nuclear physics, obtained in a period of not more than 5 calendar years before the date of the competition. The application can also be submitted by students who are awaiting a PhD in the period before the deadline for receiving applications of the current year. It is necessary to provide a copy of the PhD diploma during the application review. It is expected that the candidate is experienced in the field of experimental neutron physics, familiar with the theoretical methods of neutron polarization, competent in cryogenic and vacuum technology, superconducting magnetic systems and microwave equipment, has knowledge and experience in the creation of control systems for devices and installations, remote work (for example, NI Labview), as well as knowledge of computer-aided design programs and thermal calculations. English proficiency.

Work Context

WORKPLACE: The work will be conducted under supervision of the local physicists and may develop in collaborations with the world neutron and nuclear physics community. It is expected that the polarization technique will be developed at JINR facilities and may be applied at the best suitable world neutron sources (ILL, FRM II, PIK, ESS etc). The work is in collaboration with organizations licensed to designing of nuclear facilities.

The job will develop in close collaboration with the Sector of investigations of neutron-nuclear interactions at the Frank Laboratory of Neutron Physics, Department of Neutron Physics. The Sector's total staff is 51 and includes 19 PhD and 3 Doctors in Science. The Department's total staff is 123.

Constraints and risks

The postdoctoral fellow will be expected to undertake international travel and travel in Russia. During experiments shift work and working on weekends may be necessary. The experiments will be carried out at IBR-2 reactor whereby the necessary authorizations will be attributed following a yearly medical examination arranged by the laboratory.

Additional Information

Applications should include a detailed CV, a brief statement of research interests, list of publications and at least two letters of reference forwarded to Dr. Otilia Ana Culicov culicov@nf.jinr.ru before February 1st 2020.

Social package offered by JINR:

- The employer offers free health insurance covering medical services in the frame of the Russian compulsory medical insurance system.
- The employer will pay no pension insurance.
- The employer can offer accommodation in its own apartments (one-, two- or three-room flat depending on the number of family members) in the limits of availability and the laboratory can partly offset the rent expenses.
- Half price access to the JINR Olympic-size swimming pool and preferential access to the sport infrastructure of JINR.

Short-listed candidates will be invited to an interview, remotely, or in person.