



Postdoctoral Programme in Fundamental Physics with Ultracold Neutrons

12-month contract, renewable for another max. 24 months

Your mission

The development of ultracold neutron (UCN) sources is important for conducting experiments investigating both the fundamental and wave properties of the neutron. We are currently developing the concept of a UCN source on a pulsed reactor, which is based on the idea of pulsed accumulation of UCN in a trap. This makes it possible to obtain a source with a high UCN density. You will be given the opportunity to make a significant contribution both to the formation of the final concept of the new UCN source and to its further creation. In addition, you will have the opportunity to take active participation in the development of experiments with their subsequent implementation on both developed and other UCN sources.

Your tasks

One of the main components of the UCN source is moderator-converter, which converts cold neutrons (CN) into UCN by inelastic scattering.

As part of the work on the concept of the source, your priorities will be:

- Analysis of possible candidate materials for use as UCN converter, considering the specifics of the planned source.
- Modeling of the converter, calculation of the UCN output from it and optimization of its geometry.
- Participation in the formation of technical requirements and in the design of a UCN converter unit.

Constraints and risks

It is assumed that it is possible to work on the experimental beam of the reactor, whereby the necessary authorizations will be issued following the annual medical examination arranged by the employer.

Depending on your citizenship, you may need to obtain a visa and this process can last several months. JINR offers all the necessary support for obtaining the entry permit for the Russian Federation.

Your profile

- Highly motivated candidate with a PhD (obtained less than 5 years ago) in nuclear physics, condensed matter physics or in a similar field.
- Age under 40, have not had more than 3 temporary positions.
- Knowledges in the UCN physics and related research are considered as an advantage.
- Programming skills are required.
- Experience in experimental neutron physics is desirable.
- As an international intergovernmental research organization, we are particularly keen to ensure that we also attract applicants from outside of Russia. You must have good knowledge of English and be willing to learn Russian (a language course will be provided by JINR).

What we offer

High quality of life

Called the "Island of Stability", the city of Dubna is ideally located on the bank of Europe's largest waterway — the Volga River (only 2.5 hours from Moscow by train or bus and 1.5 hours by car from Sheremetyevo International Airport). It is important for us that our employees quickly and easily adapt to the new living conditions and have a healthy work-life balance. Therefore, we offer accommodation in comfortable guest-house rooms (for singles), or fully furnished flats owned by JINR, and annual paid leave.

Prospects

We guarantee you a **12-months postdoctoral contract, renewable for another max. 24 months (36 month in total)**, in a multicultural scientific environment.

Remuneration

2300 USD per month, paid in Russian rubles at the planned exchange rate (forecasted year-average), which is adopted with the JINR budget for the current year. In 2023, the exchange rate is 69.2 Russian rubles per 1 USD.

Income tax of 13% is applied. The employer shall pay no pension insurance.

Benefits

We offer considerable social benefits: settling-in allowance, air fare (except for family members), free local health insurance for you and your family members, relocation assistance (under certain conditions), free public school or kindergarten attendance for children. We also offer free Russian courses and subsidies for the use of JINR sports infrastructure (Olympic swimming pool, stadium, gym, etc.), as well as access to a variety of cultural activities.

[Apply now](#)



Joint Institute for Nuclear Research (JINR) — operates a large park of accelerators and a reactor based intense neutron source in Dubna (Russia). From the very foundation of the Institute, the implementation of the JINR motto “Science brings nations together” has grown into a special scientific atmosphere of mutual respect and support. Let's work together to better understand the fundamental properties of matter that might enable a quantum leap in the living standards of our society.

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