



## **Postdoctoral Programme in Nuclear Physics with Neutrons**

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

### **Your mission**

The main objective of this position is development of the fast elemental analysis technique using tagged neutron method (TNM) for soil research. Successful solution of this task will be useful for agriculture, soil carbon monitoring and environmental applications.

TNM is based on the fact that products of neutron-producing reaction  $d(T,4\text{He})n$  are emitted in opposite directions. The registration of alpha-particles by a position-sensitive detector in coincidence with secondary  $\gamma$ -radiation significantly decreases the number of background events.

This work is focused on the solution of well-known problems of the TNM-based approaches to develop compact setups for elemental analysis: searching a compromise between cost, compactness, energy resolution of the used  $\gamma$ -detectors and accuracy of the results. The most straightforward way to do it is Monte-Carlo modeling so it will be a significant part of work.

### **Your tasks**

You will work with our Tagged Neutron group at the TANGRA facility. Your research programme will focus on:

- Modeling and optimization of the experimental setup for laboratory and in-field soil elemental analysis.
- Development of a proper technique for the data analysis as well as implementation of that technique in software
- Assistance to the scientists in experimental work with testing setups.

### **Constraints and risks**

The candidate is expected to undertake international business trips for periods varying from 1 to 4 weeks. Shift work and work on weekends may be necessary. The work will be carried out with

sources of neutron and gamma radiation, 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 physics, computing or in a similar field.
- Age under 40, have not had more than 3 temporary positions.
- Strong background in experimental physics or programming is a prerequisite.
- Practical experience in neutron physics research and GEANT4 computer simulations would be advantageous.
- 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

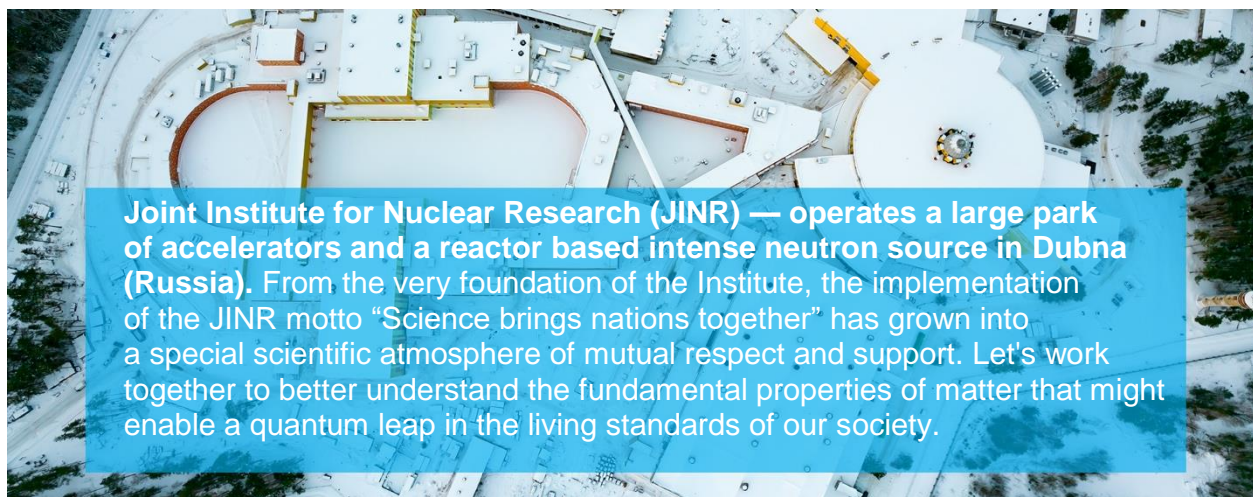
2300 USD per month, paid in Russian rubles at the planned exchange rate (forecasted year-average), which is adopted with the JINR budget for the current year. In 2023, the exchange rate is 69.2 Russian rubles per 1 USD.

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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