



## **Postdoctoral Programme in Software Development for Global Analysis of Neutrino Experiments**

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

### **Your mission**

The main objective of this position is global three-flavor oscillation analysis of the existing neutrino data. The analysis considers the development of software for neutrino oscillation analysis based on the tool GNA (<http://gna.pages.jinr.ru/gna/>), developed at JINR, or on its successor.

An existing example of a similar tool is NuFIT.

The work is closely connected with advanced application of computer skills to the data analysis and deep understanding of three-flavor neutrino oscillation experiments.

### **Your tasks**

Your research programme will focus on:

- Infrastructure development for performing simultaneous data fit of many experiments.
- The preparation of the models of various neutrino experiments (accelerator, reactor, atmospheric and solar) that will be used for the global fit:
  - simplified but still valid implementation of experiment simulation;
  - cross-experiment systematic correlations.
- Development and optimization of the analysis software (GNA, dag-flow), potentially including:
  - porting the code to GPU;
  - implementing automated differentiation.

### **Constraints and risks**

The candidate is expected to work a lot with computers, undertake international business trips for periods varying from 1 week to 1 month.

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, namely neutrino physics or high energy physics or computer science.
- Age under 40, have not had more than 3 temporary positions.
- Strong background in particle physics and advanced knowledge of linux, C++ (and possibly python) is a prerequisite.
- Working experience within neutrino oscillation experiments 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

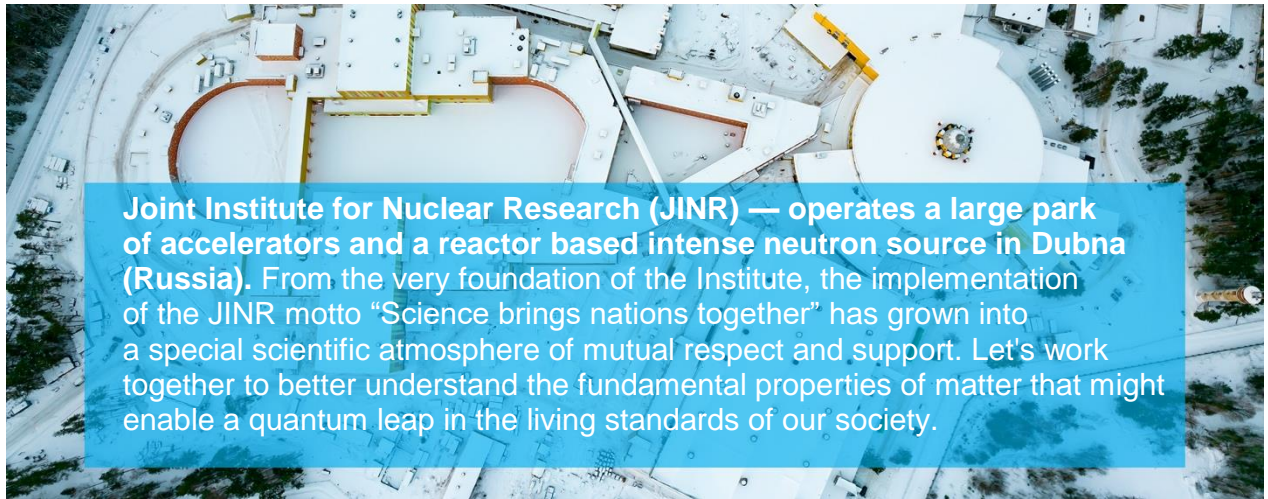
2300 USD per month, paid in Russian rubles at the planned exchange rate (forecasted year-average), which is adopted with the JINR budget for the current year. In 2024, the exchange rate is 90.1 Russian rubles per 1 USD.

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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