



Postdoctoral Programme in Investigation of Superconducting and Magnetic Order Parameters at Nanosystems with Weak Chaos by Polarized Neutron Reflectometry

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

Your mission

The main objective of this position is to understand the formation of the nontrivial superconductivity and magnetism at low- dimensional heterostructures by means of polarized neutron reflectometry. These include such materials and phenomena as weak chaos systems (mainly 3D and 1D quasicrystals), magnetic and superconducting properties changing under irradiation influence (gauss defects), magnetic superconductors (pnictides & ferroselenides), intertype superconductivity, 4f magnetism & noncollinear magnetism, frustrated magnetism (Kagome Nabokoite, howarddevansites, Kitaev systems, herbertsmithite), superconducting and magnetic perovskites (thermal expansion and other), Moire graphene, 5f systems, high entropy alloys. This will allow to understand mechanism of superconductivity and magnetism at such materials. These investigations are useful for creation of new elements of superconducting spintronics and superconducting quantum computing. The development of neutron reflectometry is necessary for the development of these studies: registration of secondary radiation, neutron reflectometry with oscillating magnetic field, grazing incidence spin echo, twisted beam, and so on.

Your tasks

You will work with our Polarized neutron reflectometry group at the reflectometer REMUR. Your research Programme will focus on:

- Investigations by polarized neutron reflectometry of superconducting and magnetic low-dimensional heterostructures that are manufactured by magnetron sputtering or molecular beam epitaxy;
- Studies of magnetic structure and phase transitions using existing setups;

- Assistance to the scientists responsible at REMUR when they welcome users for experiments with a similar scientific task in order to further develop your scientific network;
- Development of the reflectometer REMUR including new modes: registration of secondary radiation, neutron reflectometry with oscillating magnetic field, grazing incidence spin echo, twisted beam, and so on.

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, remote work is allowed. The work will be carried out at the neutron sources, 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, materials science, solid state physics or in a similar field.
- Age under 40, have not had more than 3 temporary positions.
- Strong background in experimental physics or materials science is a prerequisite.
- Practical experience in reflectometry or relevant neutron scattering methods and superconductivity and/or magnetism research would be advantageous.
- As an international intergovernmental research organization, we are particularly keen to ensure that we also attract applicants from outside Russia. You must have a good knowledge of English and be willing to learn Russian (a language course will be paid for by JINR).

** Winners of last year's JINR Postdoctoral Programme and JINR Fellowship Programme who were previously employed at JINR are not eligible to participate in the contest again, as current JINR employees.*

Candidates from JINR Member States are considered for employment at the Institute by nomination from JINR Member States Plenipotentiary Representative.

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 single employees), or fully furnished flats owned by JINR, and annual paid leave.

Prospects

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

Remuneration

US\$ 2,300 per month (paid in Russian rubles at the planned exchange rate (forecasted year-average, adopted in the JINR budget for the current year, which is fixed on the date of conclusion

of the contract and valid throughout its entire term). In 2026, the exchange rate is RUB 92.2 per US\$ 1. The exchange rate for 2027 is preliminary planned to be RUB 87.4 per US\$ 1).*

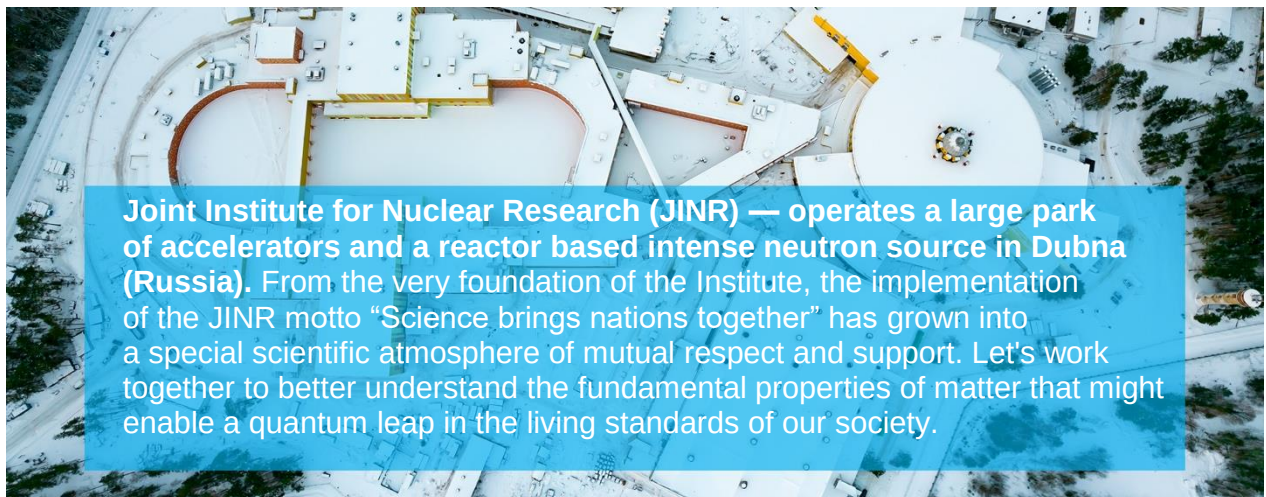
Income tax of 13 % is applied. The employer shall pay no pension insurance.

*The average per capita income in the Moscow region is 110 thousand rubles.

Benefits

We offer considerable social benefits: annual paid leave of 42 calendar days with an additional one-time payment of 50 % of your monthly salary after one year of employment, air fare (except for family members) at the beginning and the end of the employment period in case the terms of the contract are fulfilled, accommodation support (50 %, excluding the cost of utilities and furniture rental), free local health insurance for you and your family members, relocation assistance (transfer from/to airport at the beginning and end of the contract for all family members). We also offer free Russian language courses and subsidies for the use of JINR sports infrastructure for the employee (Olympic swimming pool, stadium, gym, climbing wall, 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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