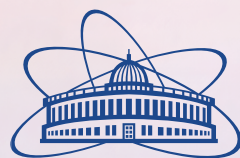


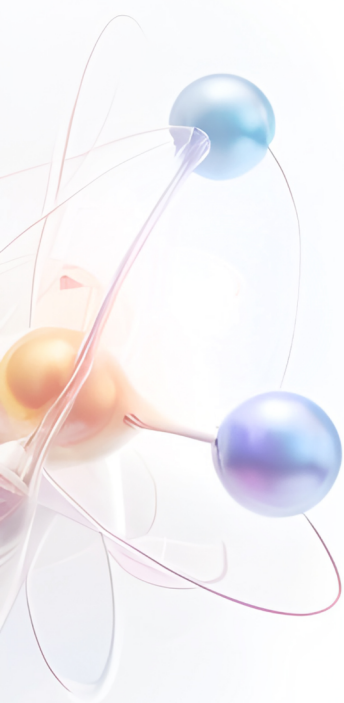


FLnP

USER GUIDE



JOINT INSTITUTE
FOR NUCLEAR RESEARCH
2026



Edited by
D. Chudoba

Translation
T.V. Avdeeva

Photography
Y.A. Tumanov
I.A. Lapenko
E.V. Puzynina

Design
K.V. Chizhova



Dubna and Joint Institute for Nuclear Research

Dubna is a science town standing 130 km north from Moscow on the banks of the Volga River.

Since 2005 special economic zone "Dubna", aimed at modern technologies development, is under construction on the territory of the town. Dubna State University, Choral school for boys "Dubna", symphony orchestra and numerous sport complexes of the town make Dubna one of the educational and cultural centers of the Russian Federation.

The Joint Institute for Nuclear Research (JINR) is a world-known centre where fundamental research is successfully integrated with the development of new technologies, application of the latest techniques and university education. JINR is a genuine international institution comprising 15 member states and 5 associated member states. The main fields of the JINR activity are theoretical and experimental studies in elementary particle physics, nuclear physics, condensed matter physics, and radiobiology.

The name "Dubnium" was assigned to element 105 of the Periodic Table in recognition of the achievements of the JINR staff of researchers and their contribution to modern physics and chemistry.

Physical start-up of the modernized IBR-2 reactor: loading of first fuel assembly into the active zone

- 1977 Reactor commissioning without liquid sodium coolant
- 1981 Reactor commissioning with liquid sodium coolant, first power
- 1982 Reactor start-up, first experiments
- 1984-2006 Regular operation for physical experiments
- 2007-2010 Modernization
- 2010 Start-up of the modernized reactor



Main parameters

Parameter	IBR-2
Mean power, MW	2
Fuel	PuO ₂
Number of fuel elements	69
Maximal burn up, %	9
Repetition rate, Hz	5; 10
Pulse width for fast neutrons, μs	~200
Rotation speed, rpm	
main reflector (MMR)	600
auxiliary reflector (AMR)	300
MMR and AMR material	Nickel+steel
Moveable reflector service life, hours	55000
Background, %	7
Number of satellites at 5 Hz	1
Thermal neutron flux from the surface of moderator:	
time average	10 ¹³ n/cm ² /s
burst maximum	10 ¹⁶ n/cm ² /s



Dear Users,

The Frank Laboratory of Neutron Physics (FLNP) is one of the seven JINR Laboratories. The scientific activity of the Laboratory focuses on two fields of science, namely nuclear physics and condensed matter research with neutrons. The first involves investigations of the neutron as an elementary particle and studies of compound states in neutron induced reactions, neutron activation analysis and applied research. The second includes compelling research programs focused on such areas of scientific interest as physics of nanosystems, structure and dynamics of functional materials, complex liquids and polymers, molecular biology and pharmacology, structure of rocks and minerals, engineering diagnostics, etc.

The greater part of all investigations is carried out in close collaboration with the JINR member states, as well as with international associates. FLNP is proud to have active cooperation agreements with almost 200 scientific institutes and universities of 40 countries from all over the globe. This statistics imply that our user program is designed for and open to both internal and external users worldwide. What is more, the international status of JINR allows users from the JINR member states to access the user program at privileged conditions. Before the IBR-2 reactor was upgraded, more than 250 experiments were realized year by year. Among these about 75% were proposed by users of the JINR member states and other countries. An enormous increase of operational abilities followed the upgrade of the IBR-2 reactor and at present the Laboratory owns one of the most intense pulsed neutron sources in the world.

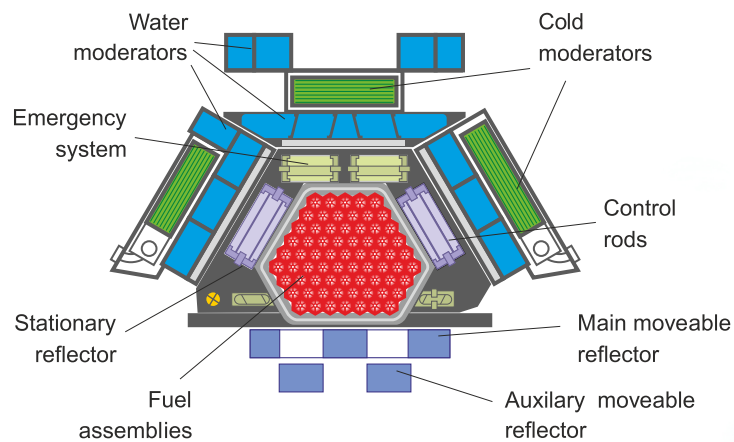
IBR-2 is a fast pulsed reactor with mechanical modulation of reactivity with a movable reflector. This unique machine has a mean power of 2 MW. In burst, its power is thousand times higher as it generates a thermal neutron flux of 10¹⁶ n/cm²/s, from the moderator surface. A set of 14 high-performance instruments, that are constantly being upgraded, are available for your experiments at the FLNP site. A team of qualified and dedicated staff comprised by scientists, engineers and technicians is ready to assist you throughout the experiments at each instrument.

If you are a physicist, a chemist, a materials scientist, a biologist or a geologist, the FLNP scientific team is ready to provide you with qualified support concerning the application of neutron scattering techniques. Please, contact the IBR-2 User Club to discuss the research opportunities we are ready to provide you with and to get a qualified advice on submitting proposals.

Welcome to the IBR-2 User Club!

Sincerely,
Egor Lychagin
Director of the Frank
Laboratory of Neutron Physics

The IBR-2 reactor core scheme



IBR-2 Experimental Hall



Neutron instrumentation at IBR-2

Diffraction:

HRFD, FSD, DN-12, DN-6, EPSILON, SKAT, DN-2, FSS

Small-angle scattering:

YuMO

Reflectometry:

REMUR, REFLEX, GRAINS

Inelastic scattering:

NERA

Nuclear Physics:

ISOMER

Neutron activation analysis:

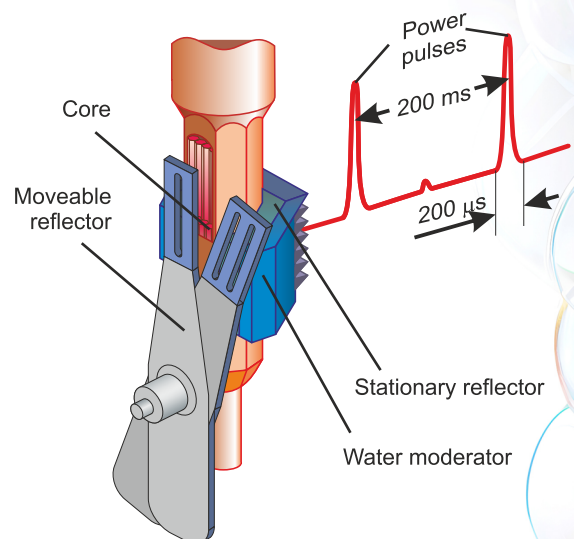
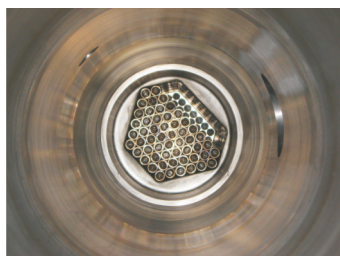
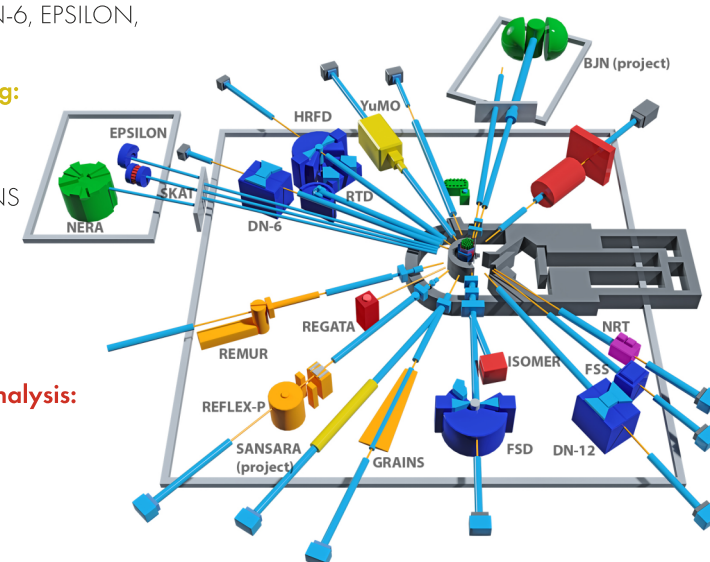
REGATA

Neutron imaging:

NRT

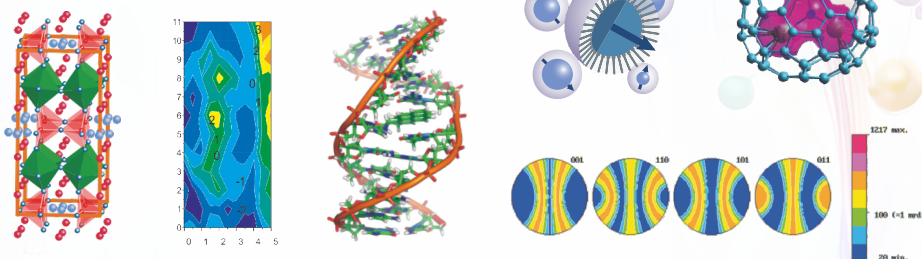
Facility projects:

BJN (INS), SANSARA (SANS)

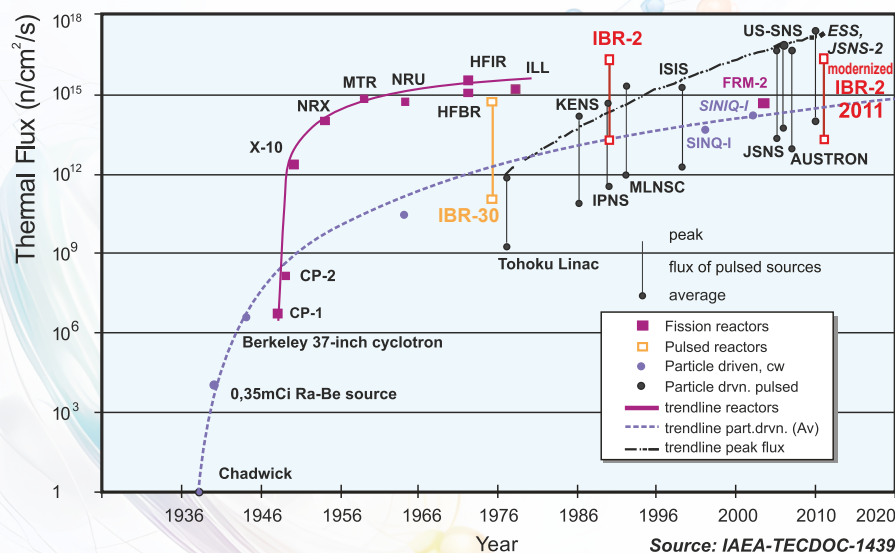


Neutron investigations at IBR-2

- Physics of Nanosystems;
- Structure and Dynamics of Functional Materials;
- Complex Liquids and Polymers;
- Molecular Biology and Pharmacology;
- Structure of Rocks and Minerals;
- Engineering Diagnostics.



World's Neutron Sources



Overview

The User Guide is designed to provide potential IBR-2 users with useful information on how to get prepared for a scientific visit to FLNP JINR. It covers the following points:

- How to become an IBR-2 user
- What to consider before the visit
- How to get the JINR Visa support
- How to get to FLNP JINR
- Detailed reimbursement regulations
- FLNP JINR policy on publications and experimental reports
- JINR safety regulations

Head of the FLNP User Program:
Mukhametuly Bagdaulet, PhD.
e-mail: flnpuserclub@jinr.int
phone: +7 (49621) 62155

What is the IBR-2 User Club?

The IBR-2 User Club is a user-friendly website essentially designed to provide the FLNP scientific visitors with online access to related administrative tools and all necessary information.

After having registered as Club members, users are identified to their accounts with a personal ID each time they log in to the User Club website. Thus, users obtain access to information of concern such as FLNP site maps, experimental reports of other users, etc.

Some Club members may be granted privileged access to other tools, according to their responsibilities and status.

The IBR-2 User Club is intended to help users with:

- submitting proposals
- entering or updating personal data
- uploading experimental reports
- keeping in touch with Secretary of the User Office

To become an IBR-2 user one should:

1. Register to the IBR-2 online User Club ibr-2.jinr.int
2. Submit scientific project when the call for proposals is announced and wait for the decision of the Committee
3. If the application for beam time is accepted, follow the instructions at the IBR-2 User Club website to get the Russian Visa and all necessary information regarding the forthcoming visit
4. Perform the experiment at FLNP JINR, Dubna
5. Upload scientific report via the IBR-2 User Club website

We would appreciate any feedback on the work of our website – its functionality and interactivity – to help us make improvements. You can also share your overall impressions of hotel accommodation and other aspects of your stay in Dubna. We are open to any suggestions.

Before your visit

Consider the following before your visit:

- **Registration** – register on the IBR-2 User Club website ibr-2.jinr.int and submit your proposal.
- **Visas** – contact the User Office flnpvisit@jinr.int in advance and get a free of charge Russian visa.
- **Health insurance** – Make sure that you have accident and sickness insurance.
- **Local contact** – Discuss the details of the experiment (sample environment equipment, sample containers, etc) with your Local Contact.
- **Site access** – The IBR-2 users are allowed to enter the JINR site only after a personal identification procedure. Make sure you have your passport with you.

In order to obtain an access permit, you must have the following documents:

For users whose occupation involves exposure to radiation:

- certificate of radiation exposure;

For users whose occupation does not involve exposure to radiation:

- medical certificate confirming that you are suitable for work involving ionizing radiation;
- certificate stating that your occupation does not involve exposure to radiation.

Please note that you will not be granted access to the IBR-2 experimental halls unless you have the above-mentioned certificates.

Costs

Get acquainted with the reimbursement regulations for the IBR-2 Users.

For users eligible for reimbursement

The FNLP reimbursement covers the following expenses only: room price (note that the type of the room depends upon availability) and the price of breakfast in the hotel. Extra nights are not included in the agreement and are to be paid by guests.

For users not eligible for reimbursement

In this case, guests are required to pay for their accommodation in cash or by credit card at the hotel reception. Please note that Visa, MasterCard, or any foreign cards are currently not valid in Russia.

Visa support

If you need a Russian visa you should fill in the form via the IBR-2 User Club at least three months prior to arrival. Please keep in mind that JINR cannot arrange visa support documents for you at short notice.

How to get to JINR

✈ We advise you to use Sheremetyevo Airport in Moscow, which conveniently runs a regular train to the Savyolovskiy railway station.

Moscow → Dubna

🚆 **Savyolovskiy/Belorussky railway station → Dubna.** Please note that there are two railway stations in Dubna: Bolshaya Volga and Dubna. Dubna station is the terminal stop and it is closer to the hotel, however, trains run less frequently there.

🚌 **Fiztech Metro bus stop → Dubna.** Bus station Katelnaya is the one you need.

🚗 **Car** may be provided by JINR or you can use a taxi (Yandex taxi is the most commonly used service)

Accommodation

Visitors who are invited to assist in the experiments get accommodation in the hotel "Dubna" (Vekslera St., 8), which is about a 20-25 minute walk from FLNP JINR.

Please note that all hotel reservations are made by the FLNP officials only. For further details please contact the User Office flnpvisit@jinr.int or visit the IBR-2 User Club website ibr-2.jinr.int.

When you arrive to Dubna, check in at the hotel first.

Hotel "Dubna" provides a 24-hour reception service

Phone: +7 (496) 216-21-25

Fax: +7 (496) 216-58-90

Useful links



[IBR-2 User Club](http://ibr-2.jinr.int)



[Head of the FNLP User Program](#)



[User Office](#)

