

Historical background
of the first pages of JINR history:
the construction of the synchrocyclotron (the “M” facility) and the residential settlement
that became the Institute’s part of the city of Dubna

1. Making a decision on construction, choosing a location, administrative subordination

On 26 January, 1946, I. Kurchatov, the scientific supervisor of the atomic project, wrote a letter to the head of the project, Chairman of the Special Committee under the Council of People’s Commissars of the USSR, L. Beria, about the need to build a cyclotron that would be more powerful than the American Lawrence cyclotron [Letter of 1946]. As a justification for the need to develop such a facility, Kurchatov pointed to the prospects for discovering new elements and new ways of obtaining atomic energy from cheaper sources than uranium. Development of the project began in May. On 13 August, 1946, the Council of Ministers of the USSR adopted secret resolution No. 1764-766ss “On the construction of a powerful cyclotron (the “M” facility) [Resolution of 1946]”. The same decree assigned project management to the Physical Institute of the Academy of Sciences (FIAN), which was to establish Laboratory No. 11 of FIAN on the right bank of the Volga, just below the Ivankovo Hydroelectric Power Station [Resolution of 1946]. D. Skobeltsyn was appointed head of the laboratory, and V. Veksler was appointed deputy. Construction work was led by Major General of the Ministry of Internal Affairs A. Lepilov. Preparations for construction began in October 1946.

However, Resolution No. 1093-314ss/op of the Council of Ministers of the USSR dated 21 April, 1947, relieved FIAN of its responsibility for the construction and transferred it to Laboratory No. 2 of the USSR Academy of Sciences (under the direction of I. Kurchatov, the future Laboratory of Measuring Instruments of the USSR Academy of Sciences (LIPAN)) [Resolution of 1947]. In the same resolution, Mikhail Meshcheryakov was appointed deputy head of Laboratory No. 2 and scientific supervisor of the “M” facility. For reasons of secrecy, the laboratory on the Volga was named the Hydrotechnical Laboratory (GTL).

The site selection involved four alternatives: Kolomenskaya (Lukhovitsky District, Moscow Region, near the village of Gorodets), Zaprudnenskaya (Taldomsky District, Moscow Region, near the Verbilki station), Kashirskaya (Mikhnevsky District, Moscow Region, near the village of Sitnya-Shchelkanovo), and Ivankovskaya (Kimry District, Kalinin Region, near the village of Novo-Ivankovo). The first three were rejected in favour of the Ivankovskaya site because of the difficulties of establishing an uninterrupted power supply and the presence of swamps [Appendices of 1947]. Despite the documented selection process, there are legends about the site being chosen personally by L. Beria due to his love of hunting in the Novo-Ivankovo forests.

2. The village of Novo-Ivankovo

The village of Novo-Ivankovo, relocated from the bank of the Volga River to the forest during the construction of the Moskva–Volga Canal, was situated near the chosen site. Nikolai Sveshnikov, a technical specialist and later an employee of the JINR Technical Communications Department, recalled it this way:

In the autumn of 1946, people, vehicles, and cargo appeared in the village of Ivankovo in the Kimry District of the Kalilinsky Region. People settled into the village houses. Cargo was dumped right under the pine trees. Vehicles were also parked in the open air. The village was surrounded by forests, and the newcomers were supposed to build something there. Everything was so secret that for several years, people simply didn’t know what was actually being built. <...> The village itself was still young. It had once stood on the banks of the Volga River near a lock, but during the

construction of hydraulic structures in 1935, it was moved into the forest, where it remained until the 1970s, when it was gradually absorbed by the city [Sveshnikov 1996].

M. Meshcheryakov, appointed scientific supervisor of the project in February 1947, also dwelled on the village and its role in developing the infrastructure of the future science city in his memoirs:

It was decided to build both the accelerator and the science city far from urban settlements. From the outset, it was clear that scientific and engineering staff would be sent from outside. But where would we get the accelerator's maintenance staff, workers for the boiler room, the bathhouse, the bakery, the stores, and the post office, without whom the science city would be impossible? Fortunately, a small village of about fifty households turned up near the construction site, and almost every one of them was in misery: one, two or even three persons had not returned from the war. This village was rebuilt in its new location just 12 years ago and was named Novo-Ivankovo. Previously known simply as Ivankovo, until 1934 the village stood where a tunnel now runs under the lock connecting the Moscow Sea with the Volga River [Meshcheryakov 1977].

3. Swampy terrain

The memoirs often mention the swampy soil, which posed difficulties for construction. A. Komarovskiy, one of the construction managers, also wrote about this. He also cited the name “snake island”, as local residents supposedly called the synchrocyclotron construction site:

...the area where the scientific centre was supposed to be built initially simply discouraged us. It was almost completely waterlogged, or at best, the groundwater level was only 20–40 cm below the surface. The locals called this area “snake island”. Indeed, there were snakes, and there was an island. To the north was the Volga River, to the east was the Dubna River, to the south was the Sestra River, and to the west was the canal. Not only prospectors but also the early builders had to navigate by boat. Geotechnical boreholes revealed that the soil in this area consisted of clean, non-clayey sands underlain by an impermeable clay layer (which determined the general swampiness). Even more encouraging was the fact that the sand layer was located above the Volga River level in the area of the downstream reach of the Volga (Ivankovskaya) Dam. This raised hopes that the chosen area could be relatively easily drained. The very first drainage collector, laid toward the Volga, surpassed all expectations. The sand drained perfectly, even during rain. <...> Thus, numerous specialized installations emerged on the site of the “snake island” — primarily in the field of high-energy physics — alongside the beautiful, well-developed city of Dubna, becoming part of the international Joint Institute for Nuclear Research [Komarovskiy 1973].

Meshcheryakov also mentioned the swampiness in his memoirs about his first visit to the construction site (March 1947):

The forest all around was damp, without any light gaps. <...> First and foremost, I had to approve the site layout for the accelerator's technological buildings. It was easy to see that the entire area allocated for construction was heavily waterlogged, especially the site where the Leningrad designers had planned to locate the accelerator buildings. Consequently, the construction site for the accelerator's technological buildings had to be shifted toward a low sand belt, where the theoretical physics building appeared much later. This is how the road, which extends Joliot-Curie Street after the railroad crossing, became curved [Meshcheryakov 1977].

The JINR scientific and technical documentation archives contain an engineering design for the synchrocyclotron, confirming the inclusion of drainage work in the construction:

In addition to the open surface drainage system, a closed ring drainage system is provided on the site to lower the groundwater level [STD JINR. Coll. 1. Inv. 1-NT. File 25. Vol. 16. Fol. 9].

The residential settlement is located on a forested site, dominated primarily by pine trees. The terrain is calm, with a general decline toward the river, which flows fairly steadily. The existing local elevation in the centre of the settlement is used for the administrative building. [STD JINR Coll.1. Inv. 1-NT. File 25. Vol. 16. Fol. 13]

4. Forced labour

The construction utilized the forced labour of inmates from the Novo-Ivankovo special zone (a corrective labour camp). Living conditions were harsh for both the prisoners and their guards. Petr Tsyrov, who served as a security guard for the construction project, recalled it as follows:

At first, only two teams of inmates were brought in to build barracks in this zone (for themselves). They worked until four in the evening, and then, when darkness fell, they were sent back to Verbilki. Electricity hadn't been installed yet, running water was only a dream, and the soldier guards cooked food over a campfire in a large common pot. The inmates were fed separately. And even better than us, the conscripts... When the first two barracks were built, the inmates (about 120 people) were housed here in the zone, and we, naturally, were required to guard them vigilantly and around the clock. By the way, the majority of inmates at that time consisted of the so-called "varezhki" ("mittens") — those serving three to eight years for theft [Tsyrov 2002].

V. Dzhelepov, who arrived at the construction site later (in 1948), but found the same situation of forced labour and strict control over construction, had similar memories:

The entire "facility" area, fenced with barbed wire, was divided into two parts: one for the camp, the other for us, the "free labourers". The situation was far from trivial: it was quite easy to find ourselves "on the other side" of the barbed wire, among the inmates; we wouldn't have to travel far...<...> The construction of the "facility" was controlled by the so-called authorized representative of the Council of Ministers, who was an employee of Beria's department. He was required to regularly report to the relevant authorities on the state of our affairs, any complications that arose, any deviations from the schedule, and anything else he deemed necessary. Basically, we were all under surveillance here [Dzhelepov 2014].

Natalya Simonova, the daughter of Dubna's first builders, also recalled the camp and the inmate builders:

The camp was right nearby. Behind our houses, along Inzhenernaya Street, stood Finnish yurts where the guards lived, and beyond that, an area surrounded by barbed wire began. That's where the inmates lived. They were the main workforce. Dubna began with them. They were led to work with guards and dogs. Right along the streets. Every house they were building was also surrounded by barbed wire, and at the corners stood watchtowers with guards on them. I walked to school along a path lined with barbed wire. And on the other side, the first cottages for physicists and engineers were already being built. Such was the symbiosis [Rastorguev, Simonova 2007].

The yurts mentioned by Natalia were also described by both Tsyrov and Sveshnikov:

Because of the unbearable cold, we were forced to abandon the notorious barracks and construct a so-called Finnish yurt from the fragments we had brought, designed to house horses (up to seven) in winter conditions. Instead of horses, we, the riflemen from the Ministry of Internal Affairs (about 60 of us), settled in, pleased with this strange dwelling with a hot stove in the middle [Tsyrov 2002].

... the first buildings — yurts — appeared on the territory of today's Blokhintsev Street. Yurts are round wooden houses made of heat-insulated panels. They housed the construction management.

Surrounding them stood barracks for the workers. A barrack is a long wooden structure, the walls of which are made of two rows of planks with sawdust between them. Over time, the sawdust dried and compacted, turning the barracks into refrigerators. Rooms of 10–12 square meters each were located along the corridor to the right and left. Each room had a brick stove, which was fired and was smoking almost all the time. In those days, barracks were the primary type of housing [Sveshnikov 1996].

5. Clearing the area, delivering materials, starting the construction

The first priority was to prepare the forested area for construction. For this purpose, construction materials were delivered and the forested area was cleared for the accelerator and the future scientific settlement adjacent to the secret laboratory. Trees and shrubs were uprooted, and the first buildings were quickly erected on the cleared land. This is how Tsyrov and Sveshnikov, respectively, recalled it:

After some time, we were sent to prepare clearings and clean the site (cut down and uproot trees, shrubs, and old stubs) for a special zone where inmates would be brought to be used in the construction of new, special facilities. To accurately estimate the total area of this zone, it's necessary to imagine the territory of today's Dubna, from School No. 4 to the Moscow State University branch, taking into account the width required for such facilities. We quickly cleared part of the forest, installed observation towers, and built a pre-zone area. There was no railway in these areas at the time (early 1947), so the first batches of prisoners were delivered from Verbilki in three trucks or horse-drawn carts [Tsyrov 2002].

The inmates, the canal builders, cut down the forest, blasted and uprooted the stubs, and built approximately forty houses on two streets. They adopted the old name of the village with the addition of the letter "N" — N.-Ivankovo, the new one [Sveshnikov 1996].

The main facilities and auxiliary premises were built simultaneously. The first laboratory building, which was to house the accelerator, was also constructed, as were other laboratory buildings, a concrete plant, a dock for barges carrying instruments, and a settlement that would later become the Institute's part of Dubna:

Pole supports were installed to supply electricity from the Bolshevolzhskaya substation. A sawmill soon began to operate near the new pier, and a little later, a mortar-mixing unit with numerous concrete mixers was tested. The territory of the current LNP site had already been cleared and prepared for the construction of Building No. 1. The construction of a suitable road there and installation of all the necessary utilities required a huge amount of effort. However, this was no easy task in the heavily waterlogged terrain [Tsyrov 2002].

V. Dzhelepov recalled it this way:

Everything was being built practically simultaneously: the main, so-called first, building, which housed the accelerator; the accelerator itself, other laboratory buildings, and the city itself... [Dzhelepov 2014].

6. Barges

Many witnesses of these events recall that cargo was delivered not only by trucks and carts, but also by water barges:

Barges loaded with bricks, gravel, sand, and timber arrived at the pier (where the "Archimedes" swimming pool is located now). This was also one of the "terminal points" of the railway, which at the time was only permitted for freight traffic. The second "station" on this railway was located

right in the main building later, by the end of 1948. Construction and installation proceeded just right off the bat [Dzhelepov 2014].

That same winter, we took an active part in strengthening the banks of the Volga (the area of the modern beach) and building a pier (opposite the gym) so that barges with building materials could moor here properly [Tsyrov 2002].

A pier was built next to the sawmill, where barges laden with cement, timber, sand, gravel, and other building materials were regularly pulled up. There were few self-propelled vessels on the Volga River, and those were mostly German, obtained as war reparations. A pusher boat towed the barges. Sometimes, six to eight would be picked up and carried to the piers. This work was primarily carried out by the pusher boat “Uporny”, with its shrill horn. It could be heard from ten kilometers away. There was a sense that the Volga River was living and working like a living creature [Sveshnikov 1996].

7. The “M” facility (synchrocyclotron)

All the difficulties described above were overcome through shock work and superhuman effort. The goal set for the project participants demanded maximum commitment. In August 1947, a ten-volume synchrocyclotron design was approved [Meshcheryakov 1977]. The accelerator was scheduled to be operational in the fourth quarter of 1949 (by Stalin’s 70th birthday). Eyewitness memories describe the pace and intensity of the work, the complex coordination of shifts and delivery schedules (for example, platforms with magnetic holding plates leaving Leningrad at 8 p.m. and arriving at the accelerator under construction at 8 a.m.) [Dzhelepov 2014]. A railway line from the Bolshaya Volga was extended to the site itself. All processes were running simultaneously: the construction of the buildings, the design of some structures, and the installation of others for the synchrocyclotron [Meshcheryakov 1977]. Finally, on 13 December, 1949, the synchrocyclotron’s first comprehensive launch took place. The facility, with its 5-meter-diameter poles, accelerated deuterons (280 MeV), alpha particles (250 MeV), and protons (480 MeV). In April 1952, a decision was made to reconstruct the installation “M” to increase the proton energy to 650–680 million electron volts [Order of 1952]. Until 1953, the synchrocyclotron remained the most powerful accelerator in the world.

8. Further development and opening of the institute

In 1949, a decision was made to build a second accelerator in Novo-Ivankovo, a synchrophasotron, officially known as the “KM facility” [Resolution of 1949]. V. Veksler was appointed its director, and project development began in 1950 [Resolution of 1950]. In 1953, the Electrophysics Laboratory of the Academy of Sciences of the USSR (EFLAN) was created on the basis of the still unfinished synchrophasotron. The hydrotechnical laboratory surrounding the synchrocyclotron was removed from the subordination of LIPAN that same year and became independent [Resolution of 1953], and subsequently received the name of the Institute of Nuclear Problems (INP). Thus, in 1954, when the residential settlement was declassified and given the name Dubna [Decree of 1954], there were already two independent laboratories in it: INP, which was conducting work on the synchrocyclotron, and EFLAN, formed around the synchrophasotron that was under construction.

Thus, Dubna received its current name, as well as two independent laboratories (the future DLNP and VBLHEP), with which it approached the next historical milestone — the creation of an international open institute. The context for its emergence was quite broad: from the beginning of the Khrushchev thaw to the reaction of the socialist bloc countries to the creation of CERN (Conseil Européen pour la Recherche Nucléaire, the European Centre for Nuclear Research) in Geneva, which united 11 European countries to conduct comprehensive research [Meshcheryakov 2010; Resolution of 1955]. Domestic high-energy physics, as well as the Western European one, required new scales and resources, which

could only be achieved by combining the efforts of several countries. The idea of creating JINR as a public open institute was also influenced by the participation of the USSR in the Geneva International Conference on the Peaceful Uses of Atomic Energy (August 1955), at which D. Blokhintsev presented the results of the first nuclear power plant in Obninsk, and V. Veksler made the first public statement about the synchrotron [Blokhintsev 1977; Orlov 1955; Veksler 1956]. Science was becoming open and international.

Preparatory work for the establishment of the Joint Institute for Nuclear Research commenced in autumn 1955, leading to the formal execution of the organizational Agreement on 26 March, 1956 [Agreement of 1956]. The Agreement was signed by 11 participating countries. According to it, the USSR transferred both existing laboratories, which were named LNP and LHE, to the newly established international organization. The signing of the Agreement opened a new page in the history of both the institute and Dubna, which grew around it (becoming a city on 24 July, 1956) [Decree of 1956]. A world centre of high-energy physics sprang up on the site where the barracks of the first builders once stood.

D. Blokhintsev was appointed Director of the Joint Institute for Nuclear Research. Three more laboratories joined the organization over the next year: the Laboratory of Theoretical Physics, the Laboratory of Neutron Physics, and the Laboratory of Nuclear Reactions, each of which developed its own powerful scientific school. Numerous experiments were conducted at JINR's accelerators and reactors, leading to hundreds of thousands of papers. More than 40 discoveries in global nuclear physics in the 20th and 21st centuries were made by JINR scientists.

Having acquired international status, the Joint Institute for Nuclear Research opened its doors to world-class physicists: for example, Frédéric Joliot-Curie visited Dubna in May 1958, and Niels Bohr in May 1961. In 1964, JINR hosted the major Rochester Conference on High Energy Physics, for which the Cultural Centre "Mir", opened in 1956, was expanded.

JINR's history from the 1940s to the present day exemplifies dedicated service to science. The Institute's current projects — the NICA accelerator complex, the Baikal Gigaton Volume Detector, the DRIBs complex, and the GOVORUN supercomputer — continue the tradition of scientific achievements established at the dawn of the atomic age on the banks of the Volga.

Appendices.

Historical photos of early Dubna



Fig. 1. The village of Novo-Ivankovo, presumably the 1950s [Prislonov 2024]



Fig. 2. The club in the village of Novo-Ivankovo, presumably the 1950s. [Prislonov 2024]



Fig. 3. A barrack, so-called “yurt”, presumably the 1950s [Prislonov 2024]



Fig. 4. Barracks of the residential settlement, presumably the 1950s. [Prislonov 2024]



Fig. 5. Tsentralnaya Street (later Joliot-Curie Street), presumably the 1950s [Prislonov 2024]



Fig. 6. Public festivities on the square in front of the JINR administrative building, Festival of Youth and Students, 1957 [Prislonov 2024]



Fig. 7. The remains of the village of Novo-Ivankovo. Photo by Yu. Tumanov, presumably the 1960s. [Prislonov 2024]



Fig. 8. Synchrocyclotron (the “M” facility), presumably the 1950s. [JINR Photo Archive]



Fig. 9. Synchrophasotron (the "KM" facility), presumably the 1950s [Pastvu]



Fig. 10. Synchrophasotron (the "KM" facility). Photographer A. Batanov, September 23, 1956 [JINR Photo Archive]



Fig. 11. The moment of signing the Agreement on the Establishment of a Joint Institute for Nuclear Research. Photographer A. Batanov, 26 March, 1956. [JINR Photo Archive]



Fig. 12. Members of the 1st Session of the JINR Scientific Council at the construction site of the new building of the Laboratory of Theoretical Physics. Photographer P. Zolnikov, 24 September, 1956 [JINR Photo Archive]



Fig. 13. A bird's-eye view of the International Conference Hall and the "Archimedes" swimming pool. Photographer: S. Dolya [Dubna from a quadcopter, 2014]



Fig. 14. A bird's-eye view of the NICA accelerator complex. [Nuclotron and booster, 2022]



Fig. 15. A bird's-eye view of the NICA accelerator complex. 2024



Fig. 16. A bird's-eye view of the NICA accelerator complex and a panorama of Dubna. 2025.