La recherche scientifique comme arme dans la guerre hybride menée par la Russie en Europe:

l'exemple de l'Institut unifié de recherches nucléaires (JINR) de Doubna, en Russie

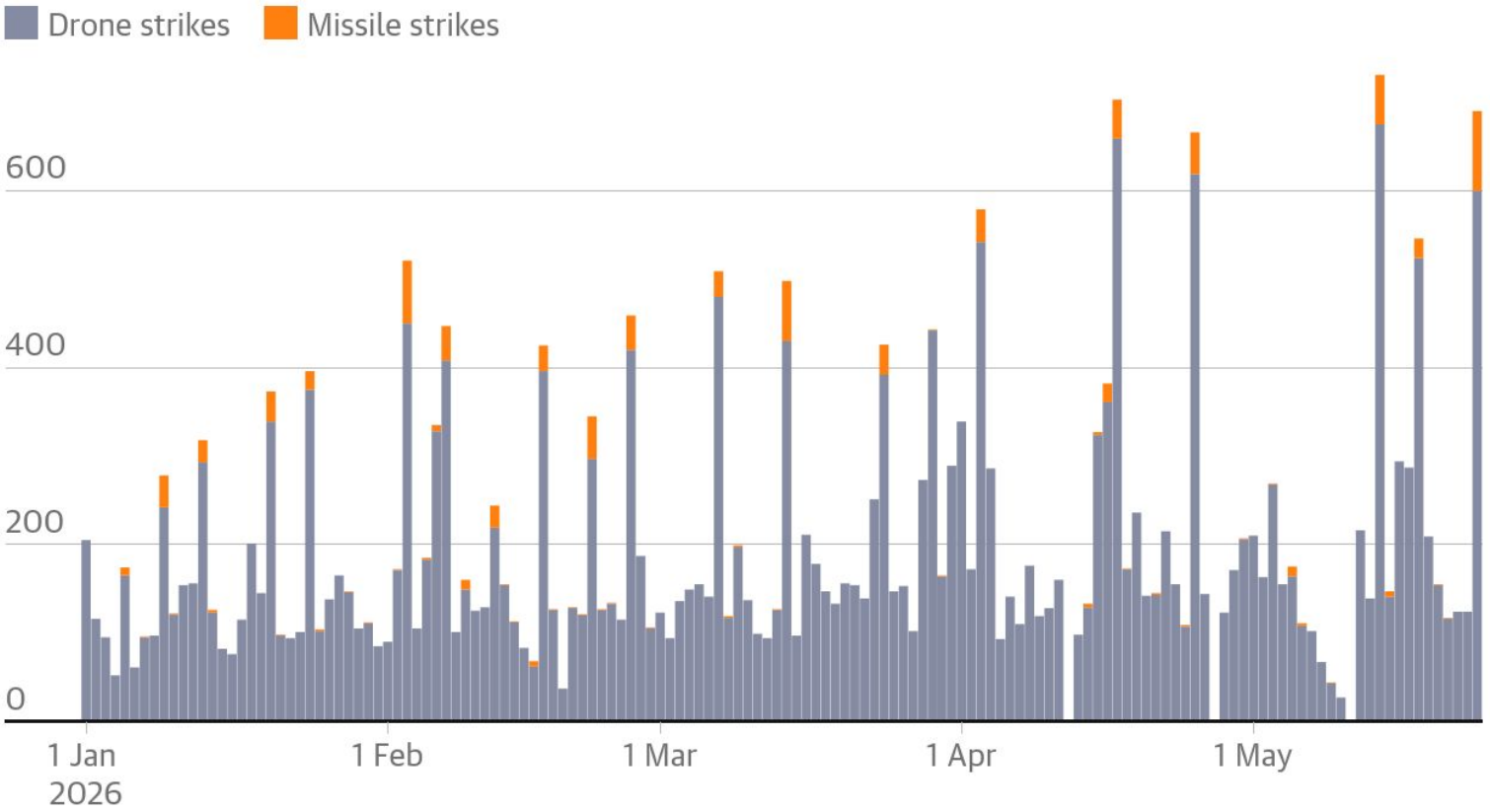
https://hal.science/hal-05562178v2

Tetiana Berger-Hryn'ova

LAPP, 26 Mai 2026

https://www.theguardian.com/world/2026/may/24/russia-hits-kyiv-ukraine-hypersonic-ballistic-missile

Daily Russian drone and missile strikes on Ukraine



Guardian graphic. Source: Ukrainian air force, data as of 8am local time 24 May 2026

Kh-101 designed and produced in Dubna

Estimated 2437 strikes on Ukraine by Kh-101/555/55 with ~⅘ intercepted as of June 2025.

Cost 1.1MUSD/unit. Production increased tenfold from 56 in 2022.

R&D by Missile Design Bureau “Raduga” (Rainbow) in Dubna

Fabrication by Dubna Machine Building Plant (DMZ)

Kh-101 attack civilian facilities in Ukraine

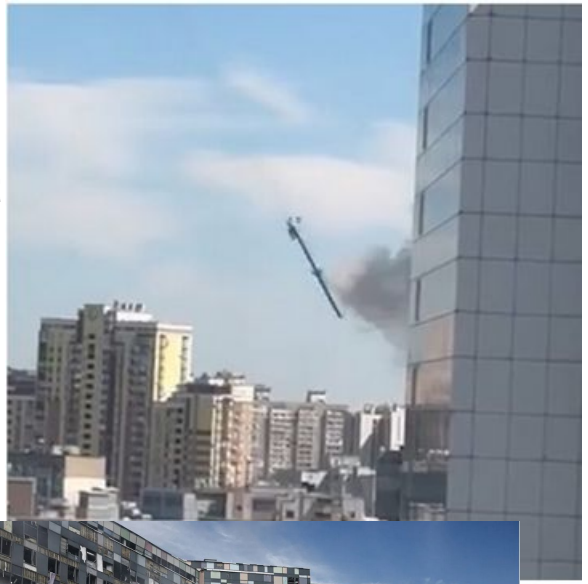
Russian Kh-101 missile that killed 12 in Kyiv was manufactured this quarter — after 21 EU sanctions packages

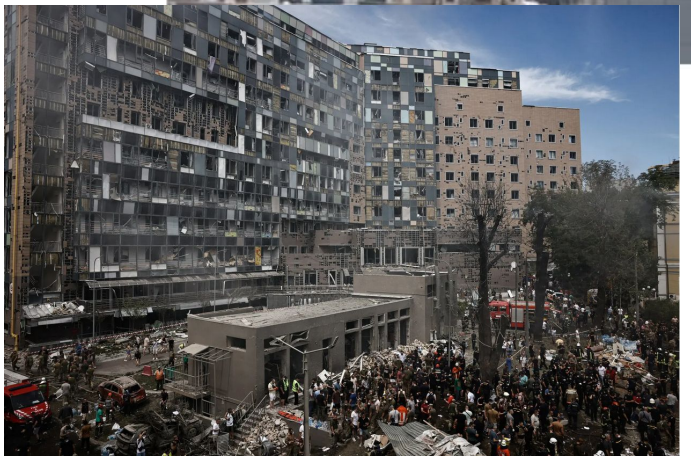
The same missile type killed 31 in a Ternopil apartment six months ago. The production line is still running.

BY OLENA MUKHINA · 14/05/2026 · 3 MINUTE READ

Follow Euromaidan Press on Google News

Kh-101 destroyed Okhmatdyt children's hospital in Kyiv in July 2024





Thomas Peter/Reuters

Dubna

MKB Raduga

The right bank hosts a missile design bureau called Raduga (“Rainbow”) and its production plant (DMZ).

Developed after the WWII by “trophy” German engineers

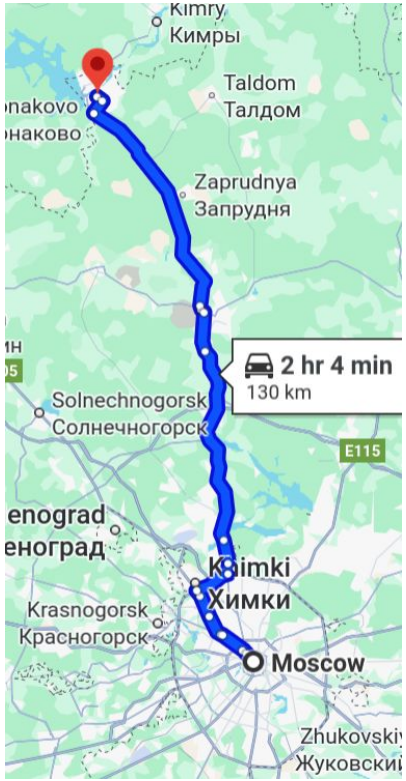
Produce cruise missiles (Kh-55, Kh-101, and others), parts of military planes (e.g. Su-25, Su-34)

JINR

JINR member states 2026 (15, with at least 2 suspended): Armenia (from 1992*), Azerbaijan (from 1992*), Belarus (from 1992*), Bulgaria (status unclear since 2022), Cuba (from 1976), Arab Republic of Egypt (from 2021), Georgia (from 1992*), Kazakhstan (from 1992*), D. P. Republic of Korea (suspended since 2015), Mongolia, Romania (status unclear since 2022), Russia (from 1991*), Slovakia (suspended since 2022), Uzbekistan (from 1992), and Vietnam (from 1957).

Russia contributes 80+% of the budget and 97% of personnel. Over 200 collaborating institutes from Russia (at least 79 under sanctions: 19 in EU, 34 in USA, 19 in Switzerland, 7 in UK and 71 in Ukraine)

JINR was put under sanctions by Ukraine on 8 August 2025



* Former USSR Republics

JINR fostering military production hub in Dubna

Collaborating in research projects, personnel training/housing/entertainment

MKB Raduga

\+ **Dubna Machine-Building Plant named after N.P. Fedorov (DMZ)**

Together Founded

Dubna State University (1995): JINR stuff trains personnel for military enterprises in Dubna area (Raduga/Krodnstadt, etc)

Стратегическое партнерство в Дубне

- Более 30% выпускников в Дубне работают в высокотехнологичном секторе экономики

из них:

- ОИЯИ – 30%
- МКБ «Радуга» – 10%
- завод «Тензор» – 10%
- НИИ «Атолл» – 6%
- ДМЗ «Камов», НПЦ «Аспект», НИИ ПА - 13%

Slides from Russian Teacher's program at CERN 2009, 2015

Стратегическое партнерство в Дубне

Strategic partnerships in Dubna

- Более 30% выпускников в Дубне работают в высокотехнологичном секторе экономики

More than 30% of graduates in Dubna work in high-tech:

из них:

- ОИЯИ – 30% — JINR - 30%
- МКБ «Радуга» – 10% — Raduga - 10%
- завод «Тензор» – 10% — Tensor plant - 10%
- НИИ «Атолл» – 6% — Atoll plant - 6%
- ДМЗ «Камов», НПЦ «Аспект», НИИ ПА - 13% — DMZ, Aspect, NII PA - 13%

Raduga/DMZ - missile production

Tensor - security systems for weapon facilities

Atoll - equipment for Russian Navy

In 2023 the Dubna State University launched a new 2-year program, during which JINR staff trains 30 engineers per year for the Kronstadt drone production plant in Dubna.

JINR fostering military production hub in Dubna

JOINT INSTITUTE FOR NUCLEAR RESEARCH

Collaborating in research projects, personnel training/housing/entertainment

MKB Raduga

\+ **Dubna Machine-Building Plant named after N.P. Fedorov (DMZ)**

Together Founded

SPECIAL ECONOMIC ZONE (SEZ)
OF TECHNICAL-INNOVATIVE TYPE «DUBNA»
(2005, **under sanctions**)

RUSSEZ DUBNA

Государственный университет «Дубна»

Dubna State University (1995): JINR stuff trains personnel for military enterprises in Dubna area (Raduga/Krodnstadt, etc)

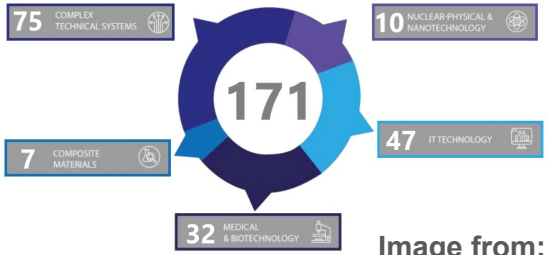


Image from: https://www.auvergnerhonealpes-entreprises.fr

Sample of SEZ residents:

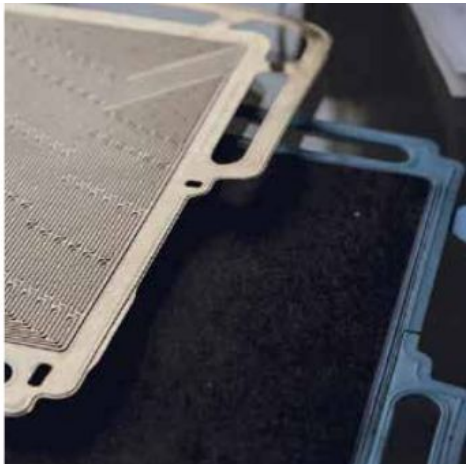
Kronstadt drone production plant

LLC YADRO FAB DUBNA: electronic components for weapons systems

Promtech-Dubna JSC: manufacturer of defense-related marine, aircraft and spacecraft equipment

Prepreg-Dubna LLC production of technical fabrics for use in shipbuilding, aircraft manufacturing, construction and other industries

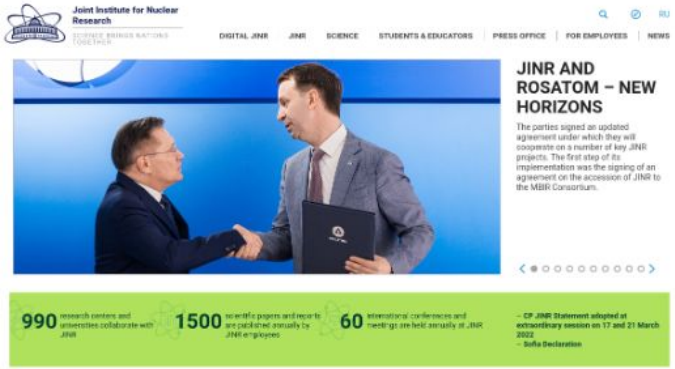
An example of Dual-use R&D at JINR



Project with Hydrogen Technology Center LLC (member of AFK Sistema Group): Development of a helicopter-type fuel-cell UAV

Drone programs were presented as an example of successful industrial application of fundamental research in the Meeting of the Council for Science and Education of the Russian Federation chaired by Putin in JINR on June 13, 2024 Full transcript and a video [in Russian].

What JINR scientists get from working with CERN/IN2P3?



In June 2024 CERN Council extended collaboration with JINR till January 2030:

- JINR claims collaboration with 990 institutions all over the world mostly through its presence in 20 experiments at CERN (e.g. full list of ALICE collaboration members is presented as “JINR collaborators”)
- On 24/05/2026 **320 JINR scientists** work at CERN
- JINR-CERN Knowledge Transfer projects (e.g. precision laser inclinometer)

JINR is a member of the International Union of Pure and Applied Physics (IUPAP, Geneva) as well as UNESCO in Paris and International Atomic Energy Agency (IAEA) in Vienna

- Used funding from IAEA for projects with stolen scientific institutes on the occupied territories of Ukraine allowing normalization of their status as “part of Russia”

JINR has a representative in the Organization committee of ICHEP2026

Scientists from France in JINR

Michel Spiro Awarded the Oganesson Prize and Honored by JINR

Membership of the PAC for Nuclear Physics

- **Dmitry Eremenko**, SINP MSU (Moscow, Russia
- **Mitko Gaidarov**, INRNE BAS (Sofia, Bulgaria)
- **Kevin Hahn**, CENS (Daejeon, Republic of Korea)
- **Guinyun Kim**, KNU (Daegu, South Korea)
- **Dmitry Klinov**, IPPE (Obninsk, Russia)
- **Valery Kuzminov**, BNO INR RAS (Russia)
- **Indranil Mazumdar**, TIFR (Mumbai, India)
- **Valery Nesvizhevsky**, ILL (Grenoble, France)
- **Jesús Lubián Ríos**, INCT-FNA, UFF (Niterói, Brazil)
- **Zhi Qin**, IMP CAS (Lanzhou, China)
- **Emanuele Vardaci**, University of Naples (Italy)
- **Makondelele Victor Tshivhase**, iThemba LABS (Cape Town, South Africa)

Programme Advisory Committee for Condensed Matter Physics

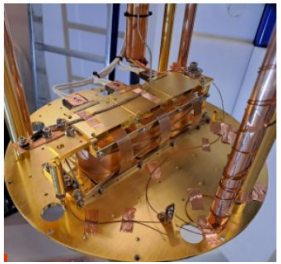
Chair: D. L. Nagy (Wigner RCP, Budapest, Hungary)
Scientific Secretary: O.V. Belov

Membership of the PAC for Condensed Matter Physics

- **Pavel Alekseev**, Kurchatov Institute (Moscow, Russia)
- **Latchezar Avramov**, IE BAS (Sofia, Bulgaria)
- **Hartmut Fuess**, IMS TU (Darmstadt, Germany)
- **Alexandre Ivanov**, ILL (Grenoble, France)
- **Sakin Jabarov**, (Supreme Attestation Commission under the President of the Republic of Azerbaijan, Baku, Azerbaijan)
- **Alexei Kuzmin**, ISSP UL (Riga, Latvia)
- **Dénes Lajos Nagy (Chair)**, Wigner RCP (Budapest, Hungary)
- **Ravi Kumar N. V.**, IIT Madras (Chennai, India)
- **Raffaele Saladino**, Tuscia University (Viterbo, Italy)
- **Deleg Sangaa**, IPT MAS (Ulaanbaatar, Mongolia)
- **Mannab Tashmetov**, INP AS RUz (Tashkent, Uzbekistan)
- **Dmitry Tayurskii**, KFU (Kazan, Russia)
- **Igor Ushakov**, FMBC (Moscow, Russia)
- **Nicolae Verga**, UMF CD (Bucharest, Romania)

Ongoing (?) JINR projects with IN2P3

https://www.in2p3.cnrs.fr/fr/cnrsinfo/le-cryostat-ricochet-prend-ses-quartiers-ill



Accueil › Actualités

Le cryostat Ricochet prend ses quartiers à l'ILL

28 mars 2024 PHYSIQUE DES NEUTRINOS

Les laboratoires impliqués dans l'expérience Ricochet

France : C2N, ILL, Institut Néel, IJCLab, IP2I, LPSC

USA : University of Massachusetts at Amherst, Massachusetts Institute of Technology, Northwestern University

Russie : JINR

Canada : University of Toronto

Contact

Maryvonne De Jésus
Chercheuse à l'IP2I Lyon
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Vincent Poireau
DAS Astroparticules et cosmologie
vincent.poireau@in2p3.fr

Thomas Hortala
Chargé de communication
thomas.hortala@cnrs.fr

ACAT-2021 IOP Publishing
Journal of Physics: Conference Series **2438** (2023) 012029 doi:10.1088/1742-6596/2438/1/012029

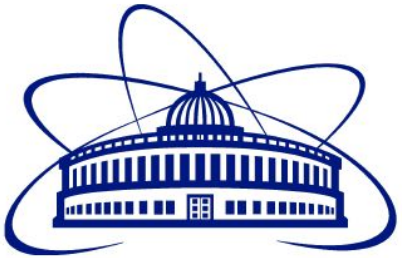
DIRAC at JINR as a general purpose system for massive computations

Vladimir Korenkov [1,3], Igor Pelevanyuk[1,3], Andrei Tsaregorodtsev[2,3]
[1] Joint Institute for Nuclear Research, Dubna, Russia
[2] Aix Marseille Univ, CNRS/IN2P3, CPPM, Marseille, France
[3] Plekhanov Russian University of Economics, Moscow, Russia
E-mail: [1]pelevanyuk@jinr.ru, [2]atsareg@gmail.com

https://iopscience.iop.org/article/10.1088/1742-6596/2438/1/012029/pdf

This work is part of JINR Multifunctional Information and Computing complex project which includes Dubna State University, Dubna Space Communication Center, Dubna Special Economic Zone (Raduga and DMZ used to be official members in previous years).

Fake collaboration with LAPP



JOINT INSTITUTE FOR NUCLEAR RESEARCH

01-3-1138-2019

p. 86 (eng.)

Modern Mathematical Physics:
Integrability, Gravity and Supersymmetry

Theme leaders: A.P. Isaev
S.O. Krivonos

Participating countries and international organizations:

Armenia, Australia, Brazil, Bulgaria, CERN, China, Czech Republic, France, Germany, Greece, Egypt, Iran, Ireland, Israel, Italy, Japan, Kazakhstan, Kyrgyzstan, Poland, Portugal, Republic of Korea, Russia, Serbia, Spain, United Kingdom, USA.

France

Annecy, ARA

LAPP | Laboratory of Annecy for Particles Physics of the National Institute for Nuclear Physics and Particles Physics | https://www.lapp.in2p3.fr/, 1138

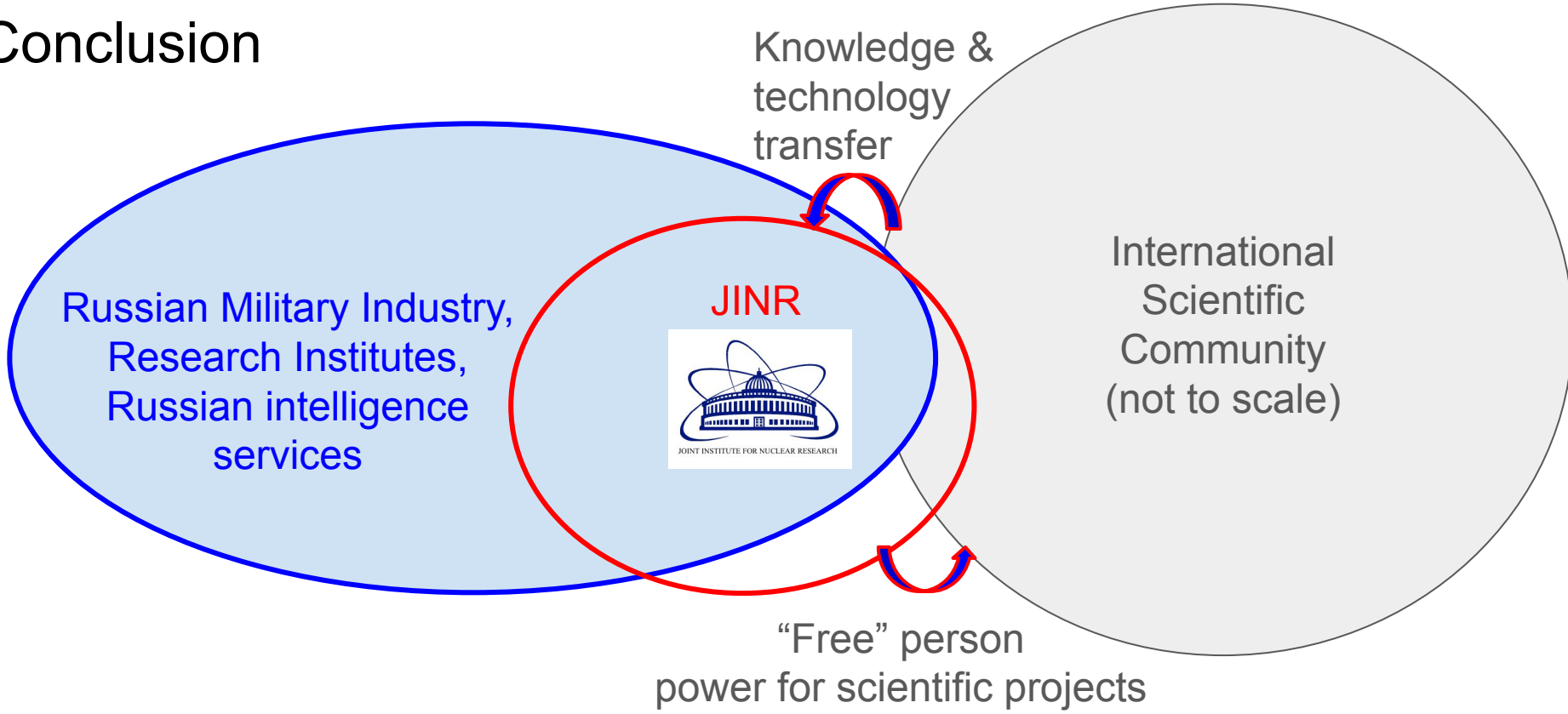
p. 253 (eng.)

p. 107 (rus) “LAPP” project contacts: E. Ragoucy & E. Sokatchev

TOPICAL PLAN
FOR JINR RESEARCH
AND INTERNATIONAL COOPERATION
2026

Франция	Анси, ARA	LAPP	Рагоси Э.	Обмен визитами
			Сокачев Э.	Совместные работы

Conclusion



Continuing collaboration with JINR allows training and technology transfer powering Russian military R&D and production (bypassing existing sanctions).

PROJECTS AND FACILITIES | NEWS

Joint Institute for Nuclear Research ‘deeply embedded’ in Russia’s military efforts, states report

14 Apr 2026

Evgeniy Bragin, an official spokesperson for JINR told *Physics World* that “nobody from the administration of the Institute can provide comment”.

https://physicsworld.com/a/joint-institute-for-nuclear-research-deeply-embedded-in-russias-military-efforts-states-report/

Backups

What JINR scientists get from CERN (1): IT expertise

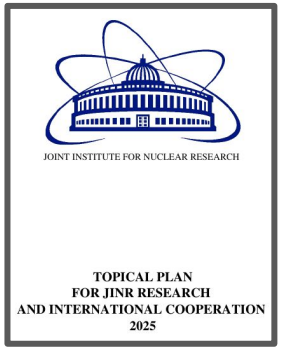
06-6-1118-2014/2030

MICC
Multifunctional Information and Computing Complex

Leaders: V.V. Korenkov, S.V. Shmatov

Deputies: A.G. Dolbilov, D.V. Podgainy, T.A. Strizh

CERN, Bulgaria, France, Slovakia, USA



Participating Countries and International organizations:
Armenia, Azerbaijan, Belarus, Bulgaria, CERN, China, Egypt, France, Georgia, Kazakhstan, Mexico, Mongolia, Russia, Slovakia, South Africa, Taiwan, USA, Uzbekistan.

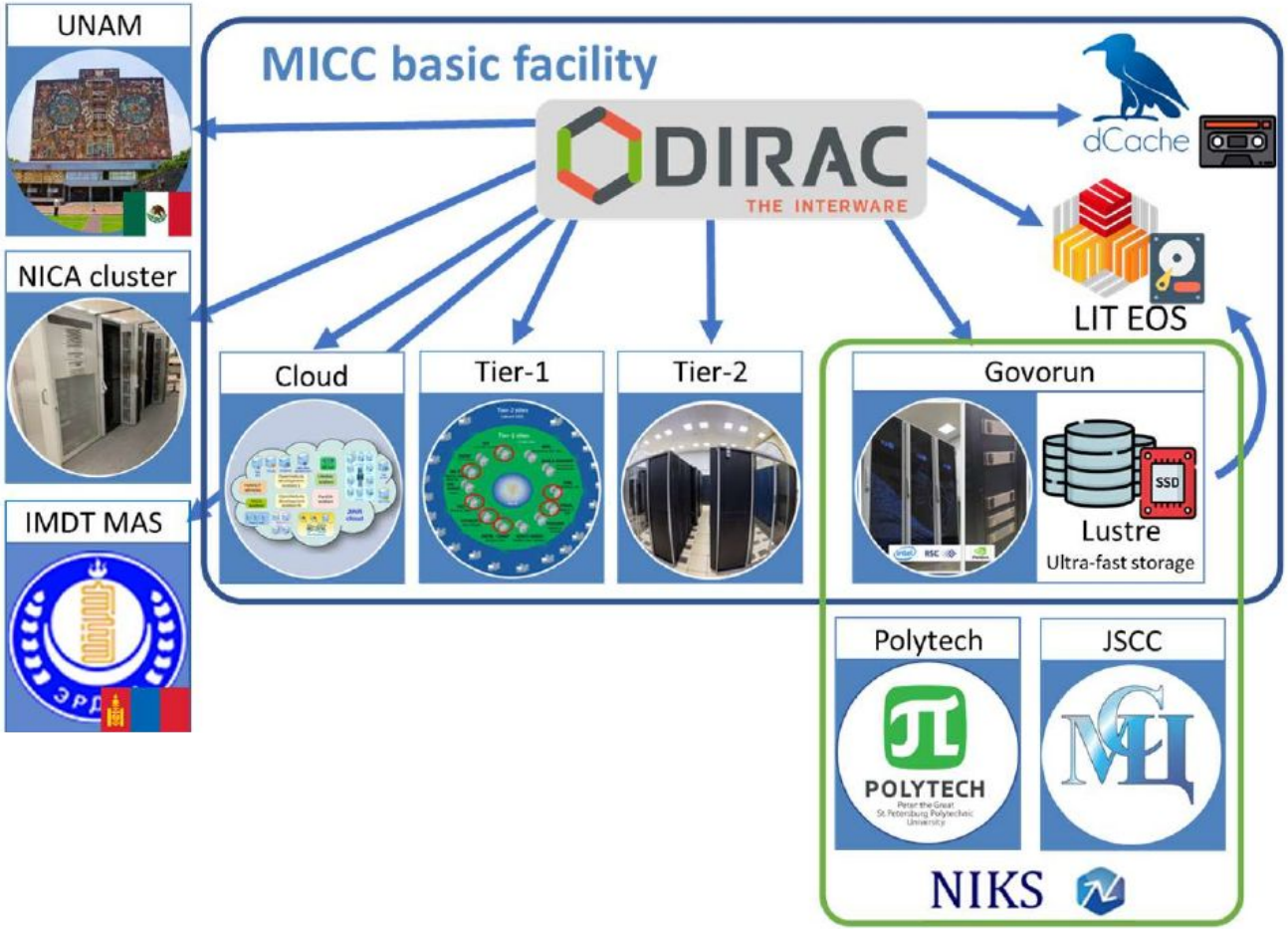
The problem under study and the main purpose of the research:
The main objective of the MICC is to meet the needs of the JINR scientific community to the maximum extent possible in order to solve urgent tasks, from theoretical research and experimental data processing, storage and analysis to the solution of applied tasks in the field of life sciences. The tasks of the NICA project, the neutrino programme, the tasks of processing data from the experiments at the LHC and other large-scale experiments, as well as support for users of the JINR Laboratories and its Member States will be the priorities.

The project presupposes the inclusion of two activities, which, like the project, are aimed at meeting the requirements of a large number of research and administrative personnel:

– development of the digital platform "JINR Digital EcoSystem", which integrates existing and future services to support scientific, administrative and social activities, as well as to maintain the engineering and IT infrastructures of the Institute, which in turn will provide reliable and secure access to different types of data and enable a comprehensive analysis of information using modern technologies of Big Data and artificial intelligence;

– creation of a multi-purpose hardware and software platform for Big Data analytics based on hybrid hardware accelerators; machine learning algorithms; tools for analytics, reports and visualization; support of user interfaces and tasks.

From GRID2023



Expertise and software created at CERN are used to run Multifunctional Information and Computing Complex in JINR shared with its collaborating institutes in such as

POLYTECH [a strategic partner of Rostec] since 2024

Dubna State Univ., SCC Dubna, SEZ Dubna

Past (?) participants: Raduga and DMZ

Example Mon.Not.Roy.Astron.Soc. 527 (2023) 3, 8784-8792

[1]*Joint Institute for Nuclear Research, Dubna 141980, Russia*
[2]*Institute for Nuclear Research of the Russian Academy of Sciences, 60th October Anniversary Prospect 7a, Moscow 117312, Russia*
[3]*Comenius University, Bratislava 81499, Slovakia*
[4]*Czech Technical University in Prague, Institute of Experimental and Applied Physics, 11000 Prague, Czech Republic*
[5]*Irkutsk State University, Irkutsk 664003, Russia*
[6]*Independent Researcher*
[7]*Skobeltsyn Research Institute of Nuclear Physics, Lomonosov Moscow State University, Moscow 119991, Russia*
[8]*Institute of Nuclear Physics ME RK, Almaty 050032, Kazakhstan*
[9]*LATENA, St Petersburg 199106, Russia*
[10]*INFRAD, Dubna 141981, Russia*
[11]*Nizhny Novgorod State Technical University, Nizhny Novgorod 603950, Russia*
[12]*Sankt Petersburg State Marine Technical University, Sankt Petersburg 190008, Russia*
[13]*Special Astrophysical Observatory of RAS, Nizhny Arkhyz 369167, Russia*
[14]*Astro Space Center of Lebedev Physical Institute, Profsoyuznaya 84/32, 117997 Moscow, Russia*
[15]*Moscow Institute of Physics and Technology, Institutsky per. 9, Dolgoprudny 141700, Russia*
[16]*Cahill Center for Astronomy and Astrophysics, MC 249-17 California Institute of Technology, Pasadena, CA 91125, USA*
[17]*Max-Planck-Institut für Radioastronomie, Auf dem Hügel 69, D-53121 Bonn, Germany*
[18]*Black Hole Initiative at Harvard University, 20 Garden Street, Cambridge, MA 02138, USA*
[19]*Crimean Astrophysical Observatory, Nauchny 298409, Crimea, Russia*
[20]*APC, Université Paris Diderot, CNRS/IN2P3, CEA/IRFU, Sorbonne Paris Cité, 119 75205 Paris, France*
[21]*Physics Department, M.V. Lomonosov Moscow State University, 1-2 Leninskie Gory, Moscow 119991, Russia*

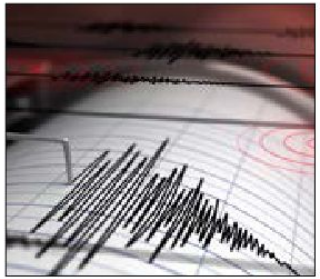
This paper has been typeset from a TEX/LATEX file prepared by the author.

Number of all publications per publisher in Scopus in 2023 (2024) affiliating Ukrainian cities to the Russian Federation

2023 (2024)	Sevastopol	Simferopol	Donetsk	Yalta	Kerch	Lugansk
Total	625 (435)	413 (381)	115 (124)	75 (54)	29 (12)	23 (18)
Springer Nature/ Pleiades	194 (115)	64 (56)	40 (47)	15 (3)	7 (3)	10 (14)
MDPI	65 (21)	25 (12)	5 (0)	12 (5)	2 (1)	1 (1)
EDP Science	43 (32)	32 (23)	4 (4)	11 (12)	8 (1)	1 (0)
IEEE	37 (19)	8 (2)	3 (1)	6 (2)	7 (2)	1 (0)
Elsevier/ Saunders	24 (36)	9 (17)	3 (5)	0 (1)	1 (2)	0 (0)

PRECISION LASER INCLINOMETER

A novel seismic monitoring technology capable of high precision sensing of ground inclination and vibration, which allows for faster seismic event identification and alerts.



The Precision Laser Inclinometer (PLI) is a compact instrument capable of measuring ground oscillations and deformations of all kinds with a very high signal-to-noise ratio. This feature allows for better detection of smaller seismic events, as well as the early signals of larger seismic events—making it a potentially life-saving technology if applied within earthquake-early-warning systems.

Unlike common seismometers, its working principle is based on laser light reflection on the surface of a liquid mirror. This allows for the measurement of minimal inclination changes and perturbations on the liquid surface. Its outstanding precision makes it capable of detecting a 24-picometer displacement at a distance of 1 m, from very low to high frequencies. This level of sensitivity is so high that it is the range used by scientists to filter Newtonian Noise in the search for gravitational waves, such as those at the VIRGO experiment.

Continue Reading »

AREA OF EXPERTISE

- Detectors

IP STATUS

- In development at CERN and the Joint Institute for Nuclear Research (JINR) since 2010. It stemmed out of the necessity to reduce the dependence of the luminosity of particle colliders on seismic perturbations.
- Currently, the associated IP is owned by both CERN and JINR
- Two patents have been granted in Russia

CONTACT PERSON

Felipe Ramos
cf.ramos@cern.ch

MAIN FEATURES

- Measures ground inclinations and oscillations on two axes.
- Outstanding precision: detection of picometer-level displacements at a distance of 1 meter.
- Sensitivity: 2.4 × 10−5 µrad/Hz½ , for frequencies between 1 mHz and 12.4 Hz.
- Compact dimensions: 40x40x20 cm3 (R&D underway to reduce the footprint by a factor of 2).
- The liquid container is free from resonances.
- The moderate vacuum construction minimizes the influence of air temperature gradient and reduces light scattering in air.

POSSIBLE APPLICATIONS

- Seismic monitoring and earthquake early warning systems
- General geological monitoring (volcanoes, landslides, ice melt)
- High-precision science research
- Civil engineering