JINR - introduction
JINR is located in the city of Dubna in 120 km from Moscow.
JINR has at present 18 Member States:

- Armenia
- Azerbaijan
- Belarus
- Bulgaria
- Cuba
- Czech Republic
- Georgia
- Kazakhstan
- D. P. Republic of Korea
- Moldova
- Mongolia
- Poland
- Romania
- Russian Federation
- Slovakia
- Ukraine
- Uzbekistan
- Vietnam

Participation of Egypt, Germany, Hungary, Italy, the Republic of South Africa and Serbia in JINR activities is based on bilateral agreements signed on the governmental level.
In November 2014, the Committee of Plenipotentiaries decided to grant the European Organization for Nuclear Research the status of Observer at JINR, following a similar decision on the status of Observer of JINR at CERN taken earlier by the CERN Council.
The research policy of JINR is determined by the Scientific Council, which consists of eminent scientists from the Member States, as well as famous researchers from China, France, Germany, Greece, Hungary, India, Italy, and CERN.
JINR comprises 7 Laboratories, each being comparable with a large institute in the scale and scope of investigations performed.

Dzhelepov Laboratory of Nuclear Problems

Veksler and Baldin Laboratory of High Energy Physics

Bogoliubov Laboratory of Theoretical Physics

Frank Laboratory of Neutron Physics

Flerov Laboratory of Nuclear Reactions

Laboratory of Information Technologies

Laboratory of Radiation Biology
JINR in some figures

- JINR’s staff members ~ 4500
- Researchers ~ 1200
  including from the Member States (but Russia) ~ 400
- Doctors and PhD ~ 1000

JINR Budget
(actual and foreseen in the 7-year Plan)
Due to collaboration between CERN and JINR at LHC and other facilities a considerable part of publications in experimental elementary particle physics is joint. However above statistics (total number of publications and citations as well as h-index) of JINR includes also serious contribution related to nuclear and neutrino physics, condensed matter physics and biophysics, theoretical physics.

Both organizations look comparably efficient in terms of bibliometry. In terms of human and finance resources (JINR has 2 times less number of scientists and 7 times smaller budget) the publication activity of JINR is quite impressive.

<table>
<thead>
<tr>
<th>Year</th>
<th>JINR</th>
<th>CERN</th>
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<tbody>
<tr>
<td>2011-2013</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total number of publications: 2897</td>
<td>Total number of publications: 3561</td>
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<tr>
<td>Total number of citations: 34079</td>
<td>Total number of citations: 48012</td>
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<td>Average citations per article: 11.76</td>
<td>Average citations per article: 13.48</td>
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<tr>
<td>h-index: 52</td>
<td>h-index: 79</td>
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<tr>
<td>Budget (2013): ≈ 143.2 million USD</td>
<td>Budget (2013): ≈ 1 264 million USD</td>
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<td>2014</td>
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<tr>
<td>Total number of publications: 897</td>
<td>Total number of publications: 1240</td>
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<tr>
<td>Total number of citations: 1149</td>
<td>Total number of citations: 3216</td>
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<tr>
<td>Budget (2014): ≈ 158.7 million USD</td>
<td>Budget (2014): ≈ 1 125 million USD</td>
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International collaboration

JINR collaborates with more than 700 scientific centres and universities in 63 countries of the world.
The concept of the Seven-Year Plan is based on the concentration of resources to update the accelerator and reactor base of the Institute. The key elements of the qualitative improvement of the research infrastructure are the following basic facilities:

– the ion collider NICA (Nuclotron-based Ion Collider fAcility) for research in the field of high-energy heavy-ion physics;

– the cyclotron complex DRIBs-III (Dubna Radioactive Ion Beams) for the search for new superheavy elements of Mendeleev’s Periodic Table and for studies of the properties of radioactive and exotic neutron-rich nuclei;

– the modernized reactor IBR-2M for research in condensed matter physics and particularly in the fields of nanoscience and nanotechnology.
Area of Nuclotron-NICA Facility

FT experiment area
Collider
New Linac
Booster
Nuclotron
Lu 20
NICA parameters:
- Energy range: $\sqrt{s_{NN}} = 4$–11 GeV
- Beams: from p to Au
- Luminosity: $L \sim 10^{27}$ (Au), $10^{32}$ (p)
- Detectors: MPD (ions), SPD (spin physics)

Preparatory works are completed ~60 000 m²!

Serial assembly and cold tests (6 arms) – December 2015

1st cold test of Booster dipole with magnetic measurements made in December’14

Cold test of serial quadrupole duplet – Feb-March 2015

Serial production of Booster dipoles and quadrupoles started in Oct 2014

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</table>
U400 and U400M isochronous cyclotrons are combined into an accelerator complex – the project DRIBs – which deals with the production of beams of exotic light neutron-deficient and neutron-rich nuclei in reactions with light ions.
Island of Stability
shoal
peninsula
continent
New lands
Neutron number
Log T_{1/2} s

New lands
1µs
1s
1h
1y
1My

Sea of Instability
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**Discovered at JINR in 1999**

**Discovered at JINR in 2000**

**Discovered at JINR in 2003**

**Discovered at JINR in 2009**

**Discovered at JINR in 2001**
SHE factory

High-current cyclotron
DC-280

New facilities

New experimental hall
IBR-2: Pulsed reactor with fast neutrons

mean power 2 MW
pulse frequency 5 Hz
pulse width for fast neutrons 200 μs
thermal neutrons flux density on the moderator surface: $10^{13}$ n/cm$^2$/s
maximum in pulse: $10^{16}$ n/cm$^2$/s
In 2014 the IBR-2 reactor operated for 2,492 hours for experiments.

163 proposals were received in total
150 proposals accepted for realization
The analysis of medicinal plants using neutron activation analysis at the IBR-2 reactor

https://sites.google.com/site/photonfoundationorganization/home/international-journal-of-medicinal-plants

International Journal of Medicinal Plants

Investigation of Elemental Content of Some Medicinal Plants from Mongolia

Nyasuren Baljinnayam\textsuperscript{a*}, Nanzad Tsevegsuren\textsuperscript{b}, Baasanjav Jugder\textsuperscript{c}, Marina Vladimirovna Frontasyeva\textsuperscript{a}, Sergey Sergeevich Pavlov\textsuperscript{a}

The authors receive Thomas Edison Award-2014 in the domain of Medicinal Plants for Inspiration and Knowledge Distribution among young research scholars.
Baikal project: Gigaton Volume Detector (GVD)

First “DUBNA” cluster of GVD in operation!

Central Physics Goals:
- Investigate Galactic and extragalactic neutrino “point sources” in energy range > 3 TeV
- Diffuse neutrino flux – energy spectrum, local and global anisotropy, flavor content
- Transient sources (GRB, ...)
- Dark matter – indirect search
- Exotic particles – monopoles, Q-balls, nuclearites, ...
To check the DANSS design, a pilot version, DANSSino (DANSS/25) was created.
JINR Multifunctional Centre for Data Storage, Processing and Analysis

- Grid-Infrastructure at Tier1 and Tier2 Levels
- General Purpose Computing Cluster
- Cloud Computing Infrastructure
- Heterogeneous Computing Cluster HybriLIT
- Education and Research Infrastructure for Distributed and Parallel Computing

- Computing modules
- Tape robot
- Uninterrupted power supply
- Cooling system
Meteorite-catalyzed syntheses of nucleosides and of other prebiotic compounds from formamide under proton irradiation
International Student Practice (ISP) and JINR Summer Student Program (SSP) in 2015

University Center is ready to run ISP in 2015 in three stages. Participation of students from 9 JINR MS is expected. The call for applications for SSP-2015 was launched on January 15.

JINR Educational Programs

At present 340 graduate students are taking part in various JINR educational programs. According to the law “On Education in RF” a new JINR PhD program has been started in 2015.

JINR Outreach Activity in 2014-2015

Outreach programs for teachers and school students from JINR Member States at CERN and JINR have been continued in cooperation with the Centre of National Intellectual Reserve of Moscow State University.
Proton therapy and medical accelerators

Proton Therapy at JINR’s Phasotron

- Unique in Russia experience of application of conformal 3D therapy method
- About 100 patients per year since 2000
- Development of the project of PT Center

C400 SC Cyclotron Project for p & C Therapy (together with IBA)
In 2016 JINR will celebrate its 60th anniversary. You are welcome to take part in this remarkable event!
Thank you and welcome to Dubna!