First-Priority Tasks of the JINR Directorate for the Nearest Years

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Acting Director of JINR

110th Session of the JINR Scientific Council
15–16 September 2011

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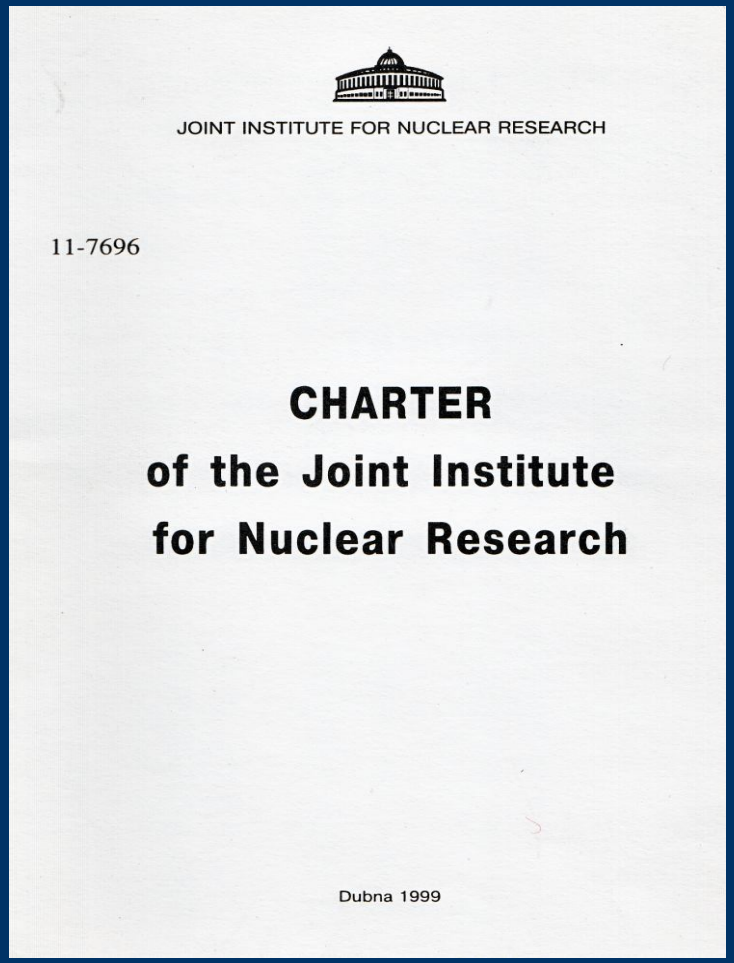


JOINT INSTITUTE FOR NUCLEAR RESEARCH

11-7696

CHARTER
of the Joint Institute
for Nuclear Research

Dubna 1999

CHAPTER V

Directorate of the Institute

Article 24

The Director is elected by the Committee of Plenipotentiaries for a 5-year term and takes his office on the 1st of January of the year following his election.

Academician Yu. Oganessian and Professor M. Itkis – laureates of the 2010 State Prize of the Russian Federation in science and technology

Moscow, Kremlin, 12 June 2011

The full text of the information is available at: http://news.kremlin.ru/ref_notes/961

Prime Minister of the Russian Federation Vladimir Putin held a session of the Government Commission on High Technology and Innovation in Dubna

5 July 2011

“I believe there are all the necessary conditions to start building world-class research facilities in Russia, mega-class research installations that would be similar in size to the world-renowned Large Hadron Collider, in order to obtain results worthy of the Nobel prize.”

Vladimir Putin, at the session of the Government Commission on High Technology and Innovation in Dubna

Session of the Government Commission on High Technology and Innovation in Dubna

Prior to the session, the Ministry of Education and Science of the Russian Federation, jointly with the interagency working group, selected 6 out of 28 submitted applications which meet the highest requirements imposed to specify the class of "mega-science" facilities. Among them is the NICA project.

- Tokamak IGNITOR
- High-flux research reactor, PIK
- Synchrotron radiation source of IV generation, ISSI-4
- Complex of superconducting rings with colliding beams of heavy ions, NICA
- International research centre for extreme light fields based on sub-exawatt power laser complex
- Accelerator complex with electron-positron colliding beams

Session of the Government Commission on High Technology and Innovation

5 July 2011, Dubna

Комплекс сверхпроводящих колец на встречных пучках тяжелых ионов NICA (комплекс NICA)

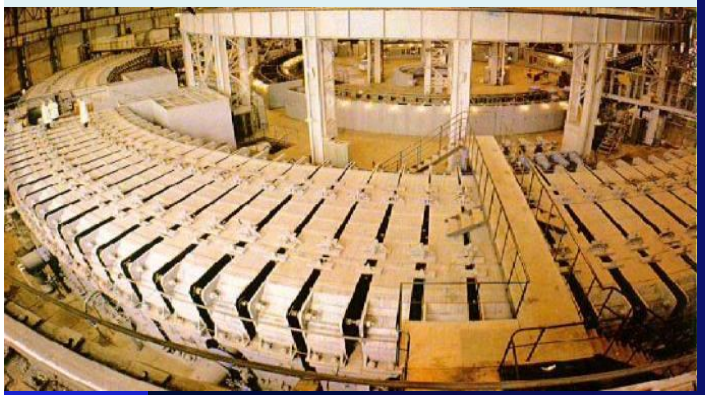
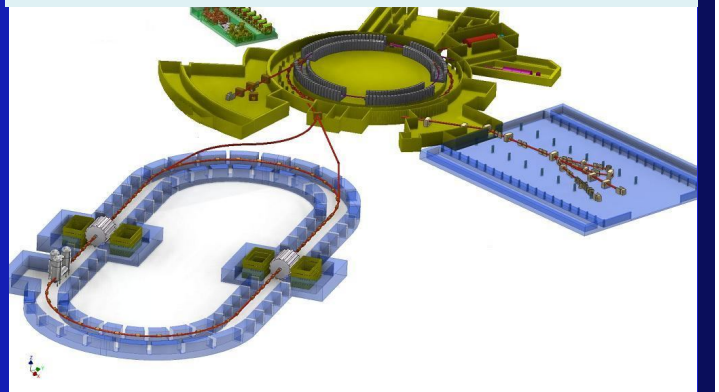
Complex of superconducting rings with colliding beams of heavy ions NICA (NICA facility)

V. Matveev

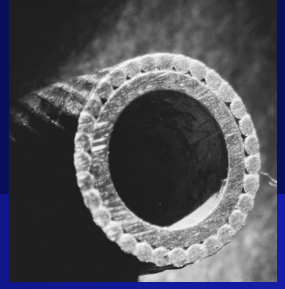
JINR's Achievements – a Basis for Advancement Towards New Objectives

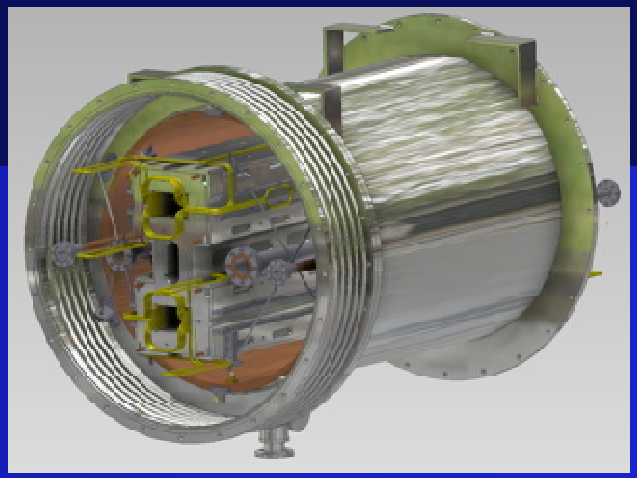
Synthesis of new transfermium elements	Condensed matter studies	Particle and nuclear high-energy physics
Internationally recognized leadership: ***- Discovery of the "Island of Stability"*** *- 102-104, 105 (Dubnium), 108, 113 – 118* *-Superheavy elements* *Russian President Prize, 2011* *- Experimental base for research:* *(U400, U400M, DRIBs), with its further upgrade, will secure leadership for decades* *Russian State Prize, 2010*	*World-class facilities:* - pulsed reactor **IBR-2M** - neutron resonance source **IREN** International multi-access centre *Integrated into the European research infrastructure*	*- Pioneering research on neutrino physics and relativistic nuclear physics* *- First in the word superconducting accelerator of heavy nuclei* *- Contributions to construction of large facilities for the LHC (CMS, ATLAS, ALICE)* *- Activities within broad international cooperation* *- Development of advanced techniques for particle acceleration and detection* *- Modern IT (GRID)*

From the First Synchrotron to High-Energy Heavy-Ion Physics

1957 Synchrophasotron	1993 Nuclotron	2017 NICA
10 GeV Aaccelerator of protons – world leader in energy  Beginning of the era of high-energy physics	First in the world Superconducting synchrotron of heavy ions 	Superconducting collider of heavy ions
V. Veksler - discovery of the phase stability principle	A. Baldin - beginning of relativistic nuclear physics	Study of nuclear matter at maximum density
		

Russian Government Prize 2010
(jointly with ITEP)





Dubna's unique technology for superconducting magnets, tested during the Nuclotron development and chosen as the basic one for new complexes of NICA (JINR, Russia) and FAIR (GSI, Germany)

NICA project (Dubna, Russia)

FAIR project (Darmstadt, Germany)

INTERNATIONAL EXPERTISE OF THE PROJECT

V.Yarba, V.Lebedev, S.Nagaitsev, A.Zlobin (FNAL), T.Roser, A.Fedotov (BNL)

B.Sharkov (FAIR), N.Walker (DESY), R.Stassen, Yu.Senichev (FZJ), M.Steck (GSI)

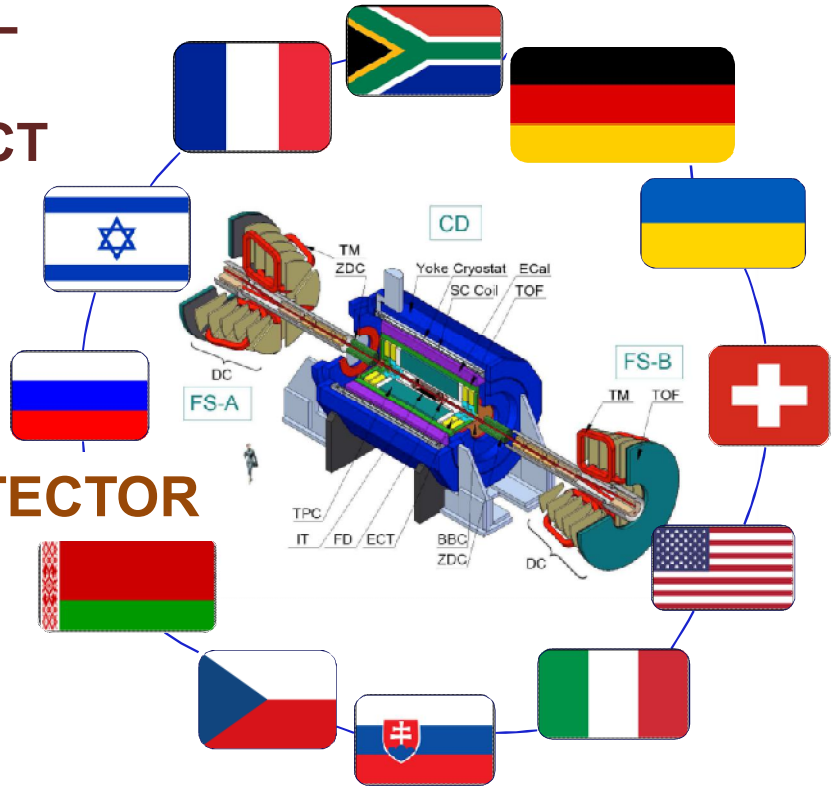
P.Zenkevich (ITEP), S.Ivanov (IHEP)

P.Belochitskii, L.Thorndlall (CERN)

T.Katayama (Tokyo Univ)

COLLIDER

DETECTOR



Machine Advisory Committee (MAC) for the Accelerator Complex

Programme Advisory Committee (PAC) for Particle Physics

International Agreements on cooperation

JINR – INP SB RAS

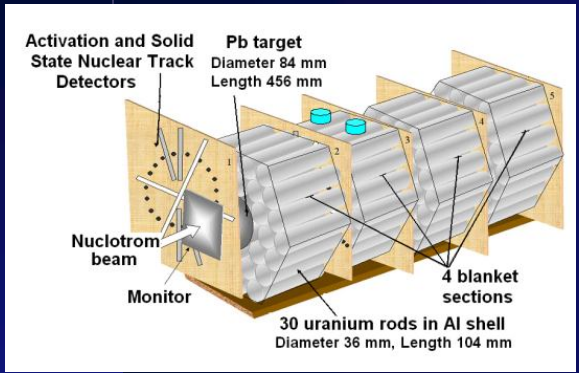
JINR - CERN

JINR – RSC KI

V. Matveev – 110th session of SC

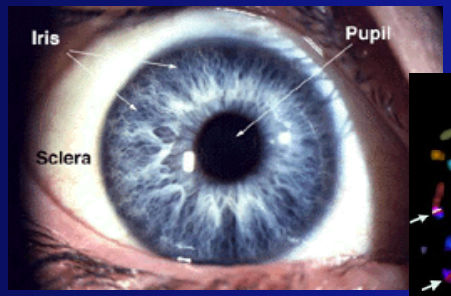
NICA-Based Innovative Projects

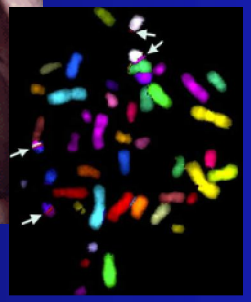
Nuclear waste transmutation



Acquisition of nuclear-physics data to design a set-up for nuclear waste transmutation

Radiobiology and Biomedicine



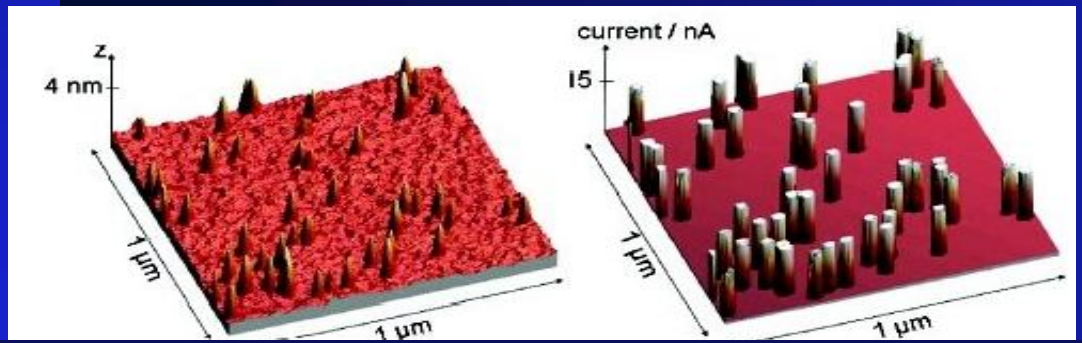


Studies of molecular mechanisms of genetic effect on human cells and damage of visual functions

Ground-based tests of space equipment elements

Development and application of accelerator and detector technologies in medicine

Ion-track technology



Production of nanowires, nanomembranes, nanotransistors…

Financing profile of the megaproject NICA (mln. roubles)

	2010	2011	2012	2013	2014	2015	2016	Total
Accelerator block	220	200	450	644	660	205	185	**2564**
Experimental block *(Detectors)*	30	37	230 400	353 500	340 500	230 700	130 600	**1350** **2700**
Applied research and innovations				100	200	250	350	**900**
Infrastructure *(scientific research and engineering)*	30	99	150 200	191 200	90 300	30 350	350	**600** **1400**
Infrastructure (*social*)	150	150	200	200	250	250	300	**1500**
TOTAL	**260**	**336**	**830** **600**	**1188** **800**	**1090** **1000**	**465** **1300**	**315** **1300**	**6014** **5000**

The resources required are shown in red: 5000 mln. roubles

Expected results

- World leadership in relevant fields of fundamental research (phase transitions and critical phenomena in nuclear matter)
- New knowledge about the Universe
- Novel technologies and formation of modern high-tech environment
- Intellectual Magnet – attracting talented young people from the Member States and other partners.

V. Putin visits the Veksler and Baldin Laboratory of High Energy Physics

5 July 2011

“To ensure a leadership we should rely on advanced technologies”.
V. Putin

Road Map of the NICA Facility
(under preparation at VBLHEP)

Objective 1: to develop the advanced accelerator experimental complex NICA and to produce, on its basis, new knowledge in the field of phase transitions, new states of hadron matter, and nucleon spin structure

Task 1.1 Accelerator complex
Task 1.2. Experiments with Nuclotron extracted beams
Task 1.3. Multipurpose set-up MPD for research of dense baryonic matter at NICA interacting beams
Task 1.4. Multipurpose set-up SPD for studies of nucleon spin structure at NICA interacting beams
Task 1.5. Research and engineering infrastructure

Objective 2: NICA International Multi-Access Centre; Innovation and Educational Programmes

Task 2.1. Experimental zones and facilities for innovative research
Task 2.2. Development of the infrastructure of the NICA international Muliti-Access Centre
Task 2.3. Development of modern educational environment of continuous studies and training of highly qualified staff

Basic principles of the JINR Directorate's policy

- **Continuity in the scientific policy of JINR and principles of its development that lay the basis for the "Road Map" and the 7-year plan for 2010-2016.**
- **Adherence to the financial policy approved by the CP and aimed at concentration of finances and their efficient use for successful achievement of the tasks of the 7-year plan of development of all basic facilities of JINR.**
- **Increase in work efficiency at all JINR departments and divisions.**
- **Every possible strengthening and development of ties with institutions and scientific communities of JINR Member States and Associate Members, consideration of their interests in JINR plans and activities.**

Basic principles of the JINR Directorate's policy

- Continuing the course to establish and develop partner ties with organizations in the EC, implementation of specific measures to integrate JINR into the European research infrastructure.
- Work-out of plans to maximize activities at existing and future facilities of JINR in the interests of interdisciplinary sciences, in particular, in Astroparticle Physics, Life Sciences, Medical Physics, Atomic and Molecular Physics, etc.
- Development of the JINR Information and Computing Complex on a priority basis.
- Development and efficient use of the JINR innovative capability and of the JINR educational programme, to the benefit of JINR Member States.

CONCLUSION

In conclusion, I would like to express my confidence that the current Directorate team, which leads the Institute and its Laboratories, is undoubtedly capable, with the support of the Scientific Council and the Committee of Plenipotentiaries, to implement the planned programme of the Institute in all its major areas in the nearest years and to outline an exciting vision of its future development.

Thank you!