

«International Intergovernmental organizations are non-state participants of international relations»

A.V. Torkunov, Rector Moscow State Institute of International Relations Textbook on international relations



# JINR:

# where your path to overseas science experience starts

Dr. Dmitry Kamanin
International Cooperation Department

Information resources: http://www.jinr.ru/main-en/ 23/01/2023

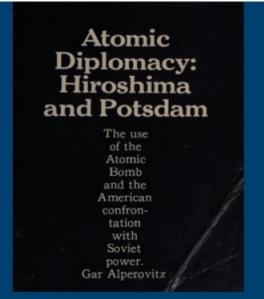


# **Atomic diplomacy**

- "Atomic diplomacy" refers to attempts to use the threat of nuclear warfare to achieve diplomatic goals. After the first successful test of the atomic bomb in 1945, U.S. officials immediately considered the potential non-military benefits that could be derived from the American nuclear monopoly.
- The factor of monopoly ownership of atomic weapons was especially evident during the Berlin (Potsdam) conference in 1945 and after the atomic bombings of the Japanese cities of Hiroshima and Nagasaki on August 6 and 9, 1945.
- Atomic weapons were seen as an effective means of "containing" and "rejecting" communism. In particular, The "Dropshot" plan developed in 1949 implied nuclear strikes on the territory of the USSR.
- Thanks to the implementation of the atomic project, the USSR managed to eliminate the US nuclear monopoly. After the tests of the atomic bomb in the Soviet Union (1949) and the launch of an artificial Earth satellite (Sputnik) (1957), it became obvious that the United States was losing its primacy in creating both nuclear weapons and their means of delivery.



WHY CAN'T WE WORK TOCETHER IN MUTUAL TRUST & CONFIDEN





On This Day In 1949



# From atomic to science diplomacy

"Science diplomacy" is one of the diplomatic tools for building both multilateral and bilateral relations between countries, based on the interaction of the scientific communities of these countries.

First examples of scientific diplomacy:

August 2, 1939 - A letter from physicists A. Einstein, L. Szilard, E. Wigner and E. Teller to F. D. Roosevelt warning that Germany might develop atomic bombs and suggesting that the United States should start its own nuclear program;

April 1942 - a letter from G. N. Flerov to J. V. Stalin calling for the beginning of the nuclear program in the USSR:

July 3, 1944 - Niels Bohr's Memorandum addressed to F. D. Roosevelt with a request not to hide from the USSR the work being done in the United States to create an atomic bomb, since the USSR is an ally of the United States, great Britain and France in the war against Germany. Roosevelt reacted to this favorably, however, W. Churchill categorically prevented the issue from being resolved having said that "this should not be done in any case and the author of this idea deserves to be put in prison"

Albert Einstein 014 Grove Md. Eassan Point Peconic, Long Island

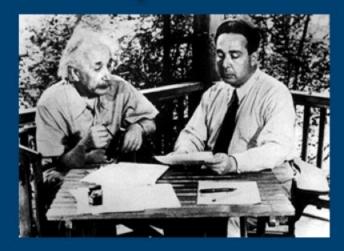
F.D. Roosevelt, President of the United States, White House Washington, D.C.

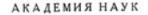
Some recent work by E. Ferni and L. Sailard, which has been communicated to me in manuscript, leads me to expect that the element uranmediate future. Certain sepects of the situation which has arisen seem to call for watchfulness and, if necessary, quick action on the part of the Administration. I believe therefore that it is my duty to bring to your attention the following facts and recommendations:

In the course of the last four months it has been made probable . through the work of Joliot in France as well as Fermi and Szilard in it may become possible to set up a nuclear chain reaction nass of uranium,by which wast amounts of power and large quantities of new radius-like elements would be generated. Now it appears almost certain that this could be achieved in the immediate future.

This new phenomenon would also lead to the construction of bombs. and it is conceivable - though much less certain - that extremely powerof a new type may thus be constructed. A single bomb of this carried by boat and exploded in a port, might very well destroy the whole part together with some of the surrounding territory. However, such bombs might very well prove to be too heavy for transportation by sir.







Союза Советских Социалистических Республик

ЛАБОРАТОРИЯ № 2

москва \_\_ 57\_\_ \*\* 1230

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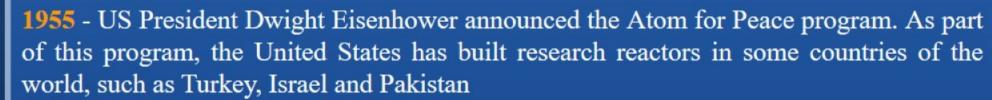
Направдяю Вам по просьбе ст.научного согрудника Лаборатории 7 2 АН СОСР тов. Фдерова Г. п. копии его писем тов. Стадину, тов. Кайтанову, секретарю тов. Стадина и мне. Письма относятся к 1941 и 1942 году и содержат ряд интересных мислет и соображений.

Поидожение на 17 листах только адресату.

# JINR founding: international "nuclear" background

1954 - the world's first nuclear power plant with a capacity of 5 MW was built and put into operation in Obninsk near Moscow.

1955 - an international conference on the peaceful uses of nuclear energy was held at the UN headquarters in Geneva. The largest number of scientists in the entire history of the world took part in it.

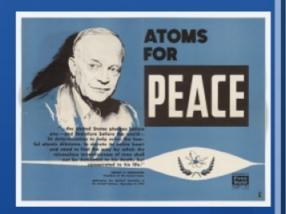


**1955** - the first agreements on the provision of scientific and technical assistance by the **Soviet Union** in the field of the peaceful use of atomic energy with East Germany, Czechoslovakia, Romania, Bulgaria, Poland and with other countries. In accordance with these agreements, by the mid-60s, modern research centers were established in Czechoslovakia, East Germany, Hungary, Romania, Poland, Bulgaria, as well as in Yugoslavia, Egypt, Iraq and the North Korea.

1956 - Joint Institute for Nuclear Research was established near Moscow in Dubna

1957 – the establishing of the International Atomic Energy Agency in Vienna







#### Establishment of the Joint Institute for Nuclear Research

The Joint Institute for Nuclear Research (JINR) is an international intergovernmental scientific research organization established under the Convention signed on 26 March 1956 in Moscow to unite the scientific and material potential of its Member States in order to study fundamental properties of matter.



# Contributions of JINR founding countries in 1956







The results of research carried out at the Institute can be used solely for peaceful purposes for the benefit of mankind.

### The most important milestones in the history of JINR

#### Formation, 0+



Moscow, 26th March 1956

#### 12 countries - founders:

Albania, Bulgaria, China, Czechoslovakia, DPRK, German Democratic Republic Hungary, Mongolia, Poland, Romania, USSR, Vietnam

International legal framework: Intergovernmental Agreement on the Organization of JINR of 1956, The Convention on the Legal Status, Privileges and Immunities of Interstate Economic Organizations of December 5, 1980, the Charter of JINR, and other regulatory and legal documents.

Privileges and immunities of the organisation, the highest governing body: the international governing Council – the Committee of Plenipotentiaries, the priority of the decisions of the Committee over the legislation of the country of residence.

#### New Era, 35+



Session of the Committee of Plenipotentiaries, Dubna, 17th March 1993

#### New member states:

- Belarus, Russia, Ukraine (December 1991)
- Armenia, Azerbaijan, Georgia, Kazakhstan, Moldova (March 1992)
- Uzbekistan (June 1992)
- Czech and Slovak Republics (March 1993)

#### Associate members:

Germany (July 1991), Hungary (February 1993), Italy (December 1996)

Agreement between the Government of the Russian Federation and JINR on the Location and Terms of Operation of JINR in the Russian Federation Ratified by the Federal Law of the Russian Federation January 2, 2000 N 39-FZ Main features of the Agreement:

- inviolability of territory allocated to JINR and all JINR premises;
- non-resident status for JINR on the territory of RF;
- immunities and privileges, including tax, custom duty exemptions for JINR regular activities;
- tax exemptions for expat JINR staff members.

#### Today, 50+

New associate members: Republic of South Africa(2005), Republic of Serbia (2007), Arab Republic of Egypt (2009)



ASRT, Cairo, 15<sup>th</sup> December, 2018 Signing of the JINR-ARE road map



Dubna, 17<sup>th</sup> October, 2019 Signing of the JINR-Serbia road map

New Member State

Arab Republic of Egypt (2021)

# JINR family: Unity in diversity

"Science and art are two forms of culture that enrich each other"

# Welcome to the Island of Dubna



## JINR Member States and Partner Network



#### 16 Member States

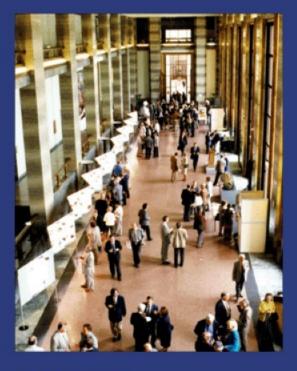
Armenia	1956/1992
Azerbaijan	1956/1992
Belarus	1956/1991
Bulgaria	1956
Cuba	1976
Egypt	2021
Georgia	1956/1992
Kazakhstan	1956/1992
DPRK (suspended 2	2015) 1956
Moldova	1956/1992
Mongolia	1956
Romania	1956
Russian Federation	1956/1991
Slovakia	1956/1993
Uzbekistan	1956/1992
Vietnam	1956

#### **5 Associated members**

Germany	1991	
Hungary	1993	
Italy	1996	
Serbia	2007	
South Africa	2005	







April 30, 1999

Exhibition "Science Bringing Nations Together"

Pas Perdus Hall of the Palais des Nations, Geneva.

Partner network – over 1000 destinations in more than 70 countries

### JINR laboratories and research infrastructure



Bogoliubov Laboratory of Theoretical Physics



Dzhelepov Laboratory of Nuclear Problems



Flerov Laboratory of Nuclear Reactions



Frank Laboratory of Neutron Physics



Laboratory of Radiation Biology



Meshcheryakov Laboratory of Information Technologies



Veksler and Baldin Laboratory of High Energy Physics



Cyclotron DC-280 / Superheavy Elements Factory



Baikal Neutrino Telescope in Irkutsk



Supercomputer "Govorun"



IBR-2 Pulsed Research Reactor

#### JINR: our common home on the bank of Volga river and the portal to all Member States



Etchmiadzin is one of the ancient capitals of Armenia, the spiritual center of the Armenian people



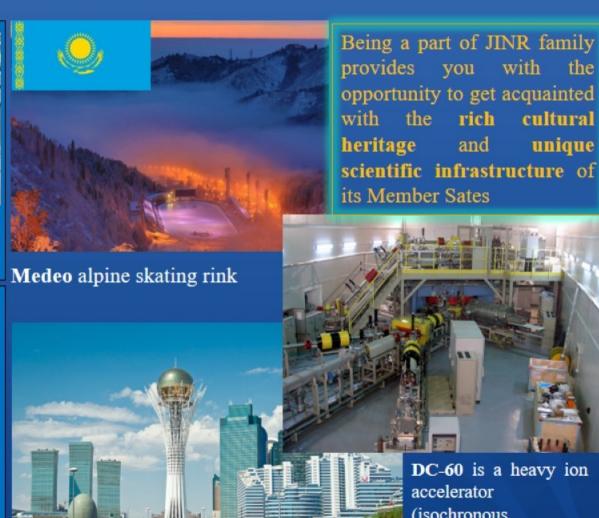
JINR Precision Laser Inclinometer installed in Garni Geophysical Observatory (GGO)



Samarkand is one of the oldest cities in the world in the middle of the VIII century BC, the capital of the Timurid Empire, the first capital of Soviet Uzbekistan



The BBP-CM nuclear reactor, the first research nuclear reactor in Central Asia, was launched in 1959 at the Institute of Nuclear Physics of Uzbekistan



Astana, the modern capital of Kazakhstan

DC-60 is a heavy ion accelerator (isochronous cyclotron), built 2006 in Astana. The cyclotron project was developed at JINR

with the

unique

rich cultural

and

#### JINR: our common home on the bank of Volga river and the portal to all Member States



Cairo, the city of a thousand minarets, is the ancient and modern capital of Egypt



ETRR-1 - first research reactor in the Middle East, launched in Nuclear center in Inshas, Egypt, in 1961



Peleş Castle is a Neo-Renaissance castle in the Carpathian Mountains, the world's first castle fully powered by locally produced electricity.



Extreme Light infrastructure – Nuclear Physics implemented by the National Institute of Physics and Nuclear Engineering Horia Hulubei



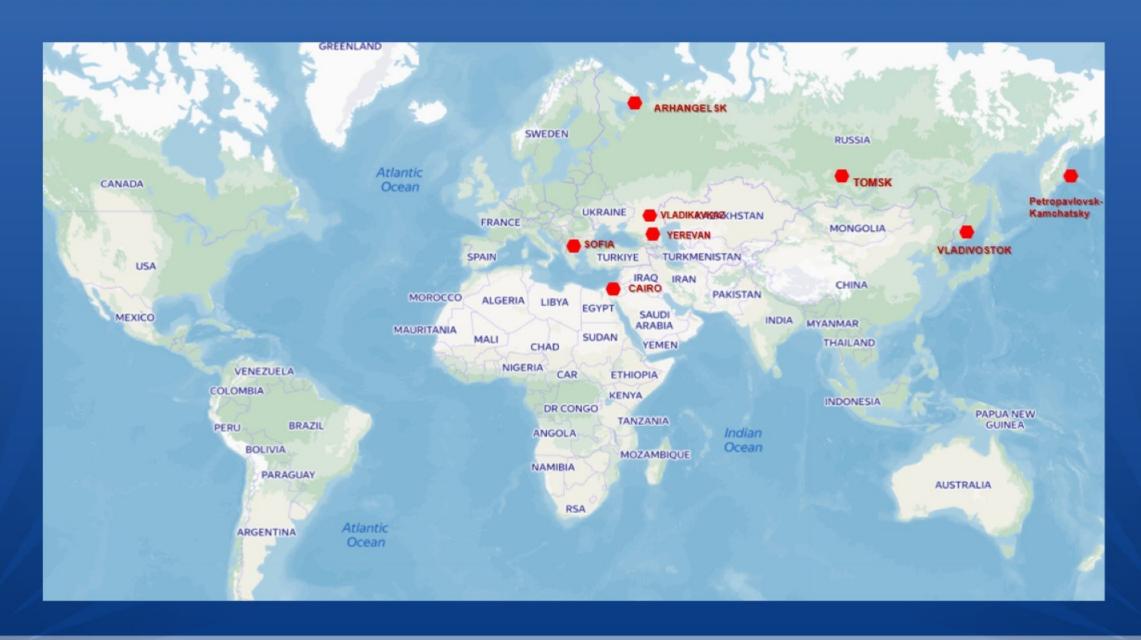
Halong Bay is a UNESCO World Heritage Site and popular travel destination



Nano Dragon, the first satellite made in Việt Nam



### JINR information centers network for the current moment



# NICA)

# JINR flagship project – collider complex NICA

MPD: 2023

NICA basic configuration cost is about 500 M\$.

#### Top-5

Contract allocations / industrial return in 34 countries / incl. 7 Member States Russia (host country)

- 1 Italy
- 2 Poland
- 3 Germany
- 4 Czech Republic

5 France

BM@N: data taking since 2018

SPD: 2025+

NUCLOTRON

operating

Booster operating since 2020

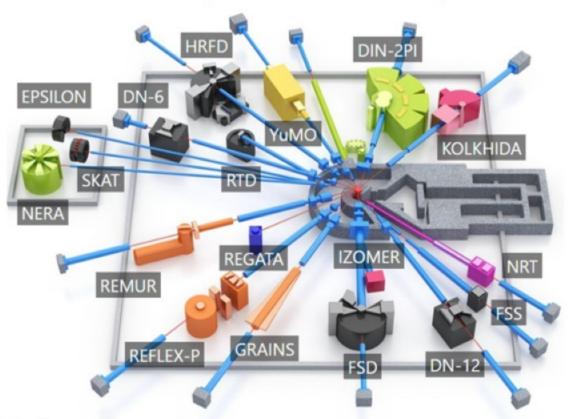
Collider: 2022

Location: JINR/Dubna

Photo: August 2022



#### IBR-2M Spectrometers Complex

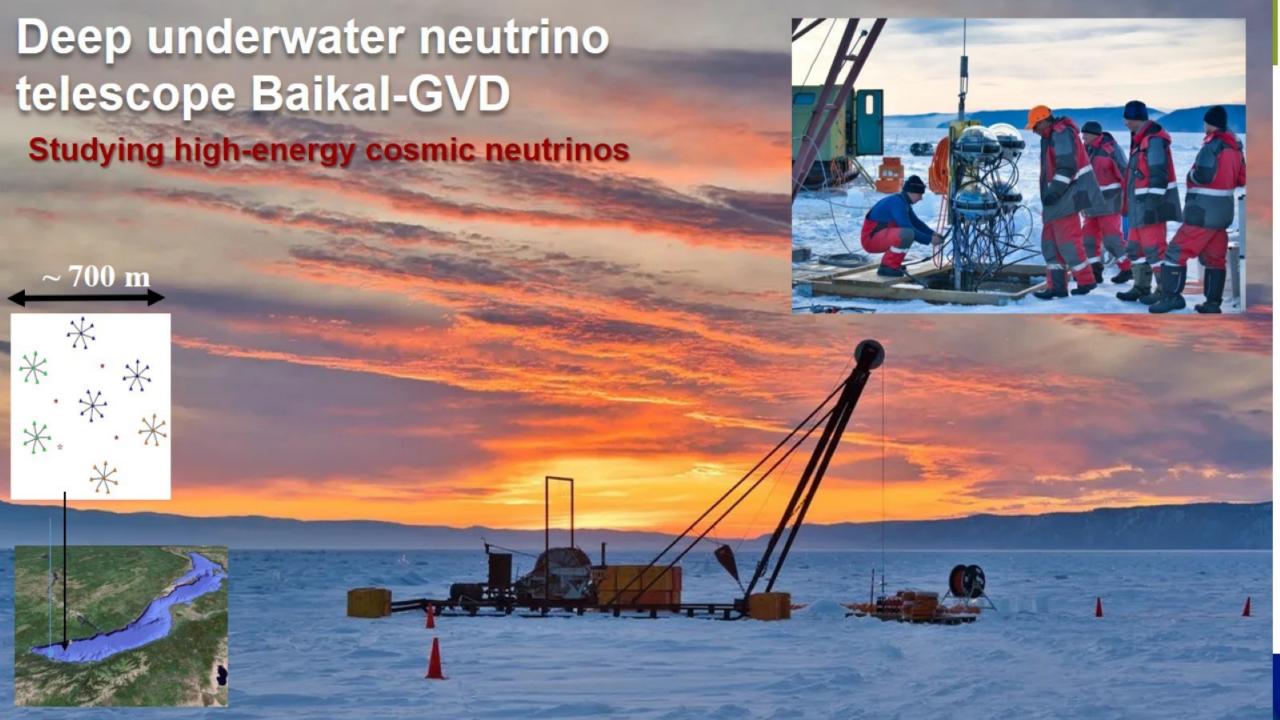


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mean power 2 MW pulse frequency 5 Hz
pulse width for fast neutrons 200 µs
thermal neutrons flux density on the moderator surface: 10<sup>13</sup>n/cm<sup>2</sup>/s
maximum in pulse: 10<sup>16</sup> n/cm<sup>2</sup>/s
reactor operation for physics experiments: ~2500 hrs/year

Diffraction (8)	HRFD, DN-6, RTD, DN-12, FSD, SKAT, EPSILON, FSS
Reflectometry (3)	REMUR, REFLEX, GRAINS
Small Angle Scattering (1)	YuMO
Inelastic Neutron Scattering (2)	NERA, DIN-2PI
Radiography and Tomography (1)	NRT
Neutron Activation Analysis (1)	REGATA
New instruments in development stage (2)	SANS-RT INS Spectrometer



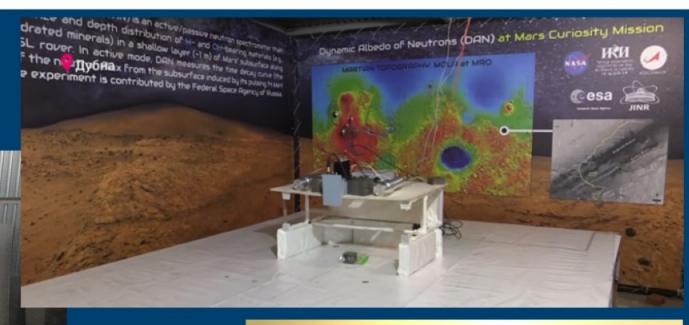




# Nuclear planetary science









#### Cool facts about JINR

Legendary JINR **Synchrophasotron**, a proton 10 gigaelectronvolts accelerator, was launched at 11 April 1957 and remained the largest in the world for three and a half years. Its magnet weighed 36,000 tons and was listed in the Guinness Book of Records as the heaviest in the world





JINR became the first center in the field of proton radiation therapy in the USSR in 1967, using a **proton synchrocyclotron** 



Long-lived superheavy elements with serial numbers were кустедн synthesized at JINR: 114 (Flerovium), 115 (Moscovium), 116 (Livermorium), 117 (Tennessine) and 118 (Oganesson)

**Mr. Element 118**: The only living person on the periodic table Prof. Yuri Oganessian works in JINR

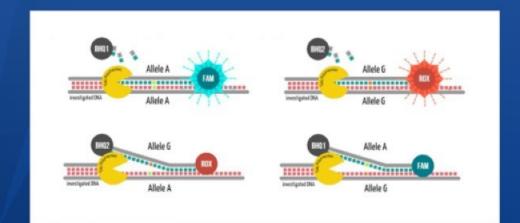
#### Cool facts about JINR



The giant 70-ton supercondacting solenoid was installed for MPD detector at the **NICA accelerator complex** becoming the "heart" of the mega science collider project

The **Govorun supercomputer** is the first hyper-converged and 100% liquid cooled supercomputer in the world. Theoretical peak performance of the machine is one petaflops





For the first time in the world, an express method for determining the **longevity gene FOXO3** was developed in the JINR laboratory

# JINR as a stepping stone for the career boost

"A journey of a thousand miles begins with a single step"

#### Career boost and launch pad in JINR: the stories of success









#### Wang Ganchang:

- Chinese nuclear physicist, one of the founding fathers of Chinese nuclear physics, pioneers and scientists of the Chinese nuclear weapons program;
- Prof. Wang was among the scientists, sent to JINR by the Chinese government 1956 in order to develop high energy physics in China;
- During his years at the Institute, Wang Ganchang became one of the co-authors of the "antisigma-minus hyperon" discovery at JINR in 1959, heading the group of discoverers of the particle;
- ➤ He was the JINR Vice-Director from 1958 to 1960 and one of the JINR founders;
- ➤ He took an active part in the project of developing the atomic bomb in China: in October 1964, the first atomic bomb test was successfully conducted, making China a nuclear-weapon state.
- During his life Wang Ganchang combined many high posts at Chinese academic and political organizations.

#### Nguyen Van Hieu:

- Vietnamese physicist, specialist in the field of quantum field theory and theoretical physics of elementary particles, foreign member of the Russian Academy of Sciences, winner of the Lenin Prize in Science and Technology in 1986;
- ➤ Nguyen Van Hieu began to work at the Laboratory of Theoretical Physics of JINR in 1960, in 1966-1969 he was the head of a group in the Laboratory of Theoretical Physics, in 1968, he became a professor at Lomonosov Moscow State University;
- ➤ After returning to Vietnam Nguyen Van Hieu held a number of administrative and research positions such as director of the Institute of Physics, deputy Chairman of the National Center for Scientific Research, president of the National Center for Scientific Research, Director of the Hanoi Institute of Technology, as well as Director of the Academy of Sciences and Technologies of Vietnam.

# **Employees from Member States in senior positions at JINR**



Latchesar Kostov (Bulgaria) Vice-Director of JINR



Otilia Culicov (Romania) FLNP Deputy Director



Norbert Kučerka (Slovakia) FLNP Deputy Director



Dorota Chudoba (Poland) FLNP Scientific Secretary



Adam Kisiel (Poland) VBLHEP Director (c 01.03.2022 no 15.03.2022)



Grzegorz Kaminski (Poland) FLNR Deputy Director



Alojz Kovalik (Czech Republic) DLNP Deputy Director



Eugen Anitas (Romania) BLTP Depute Director



Ján Buša (Slovakia) MLIT Deputy Director



Ochbadrah Chuluunbaatar (Mongolia) MLIT Deputy Director



Samvel Haroutyunyan (Armenia) MLIT Deputy Director



Bekhzod Yuldashev (Uzbekistan) Advisor to the JINR UC Director

# The South Africa's best success story in JINR



Alaric Rossouw, born in Dubna in Arpril 2021

#### Biography of Arnoux Rossouw

March 2010

BEng., Stellenbosch University Mechatronics

March 2013

MScEng., Stellenbosch University Electronic Engineering.

2013 - 2014

Postgraduate Laboratory Manager

Electrical & Electronic Engineering Department,

Stellenbosch University.

2014 - 2017

Process Engineer Comberry Ltd.

2016

Merried Caren

2017 - 2022

Senior Engineer

Joint Institute for Nuclear Research.

April 2022

PhD., Stellenbosch University

Electrical Engineering.

2022 - · · · ·

Scientific Researcher

Joint Institute for Nuclear Research.

Head of the National Group of South Africa in JINR



# Why working in an international scientific organization is interesting and promising?



Working in an international research organization gives you:

access to the world's best research infrastructure

access to the advanced scientific infrastructure of the Member States

the chance to work in an international team of like-minded people

the possibility to visit different countries of the world where scientific events are held

the opportunity to participate in scientific projects, the results of which belong **to your country** as well as to other Member States

the status of JINR employees is equivalent to that of the administrative and technical staff of a **diplomatic mission** 

# Comfortable environment for life and creativity

"Being determines consciousness" (the place where you live, forms a worldview)

# Accommodation for JINR young specialists



First guests of the hotel after the renovation - the Ambassadors of the Czech Republic, Poland and Slovakia. 24-26 September 2021



#### **Facilities provided:**

- > 24-hours electricity supply;
- > central heating system;
- > 24-hours hot water supply;
- ➤ high speed Internet;
- close proximity to the Institute;
- location in the city center near the picturesque Volga embankment









# JINR social infrastructure











Scientists' club







# Social and cultural activities in JINR



The

JINR

Project "Scriabin. Universe" in Synchrophasotron Hall



Popular science lectures



Fair of JINR Craftsmen



Concerts of JINR employees and their children









# Science & Diplomacy

"It is the diplomacy of scientists that is a promising format of international contacts with the potential to influence international relations"

## Science diplomacy in international research organization

- ➤ Science diplomacy is defined as a set of practices based on the intersection of science, technology and foreign policy;
- ➤ Science diplomacy is a multi-actor effort in which diplomats, scientists and science managers as well as other non- state actors can have a role and can contribute to its deployment. This applies at the local, regional, national and international level;
- ➤ Being a platform for Science diplomacy International research organization provides the tools, services and formats for interaction between scientists and governmental representatives of the Member States;
- ➤ Using science as a universal tool International research organization provides the common language to build bridges between cultures and countries



### JINR as a platform for science diplomacy

the main directions of scientific diplomacy:

"Science for Diplomacy" implies the use of scientific cooperation to build and improve relations between countries on a neutral basis



26 November 2019, a regular session of the Committee of Plenipotentiaries of the Governments of the JINR Member States in Vietnam. Plenipotentiaries of Armenia and Azerbaijan participate jointly in the work of the committee and other scientific events of the Institute despite the political tensions between the countries

"Science in Diplomacy" involves the use of scientific knowledge in making foreign policy decisions



30 August 2022, a JINR delegation took part in the 26th meeting of the Sub-commission for Scientific and Technical Cooperation of the Russian-Chinese Commission for the Preparation of Regular Meetings with Heads of Governments

"Diplomacy for Science" involves the use of classical tools of diplomacy to support the scientific community by concluding cooperation agreements with foreign countries at the governmental or institutional level



The agreement on the establishment of the Joint Institute was signed on March 26, 1956 by the representatives of the governments of 11 founding countries

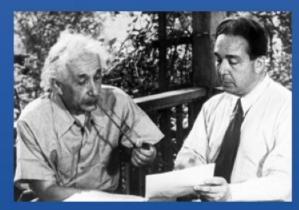




## Where your path to big science starts...

The stereotype: only career diplomats and outstanding scientists can participate in scientific diplomacy





The reality: Every researcher representing his/her country at JINR becomes an Ambassador of its scientific achievements and values of international cooperation





#### **Not Brain Drain but Brain Gain**

- ✓ by becoming a member of a large JINR family, you make your intellectual contribution not only to the success of an international scientific organization, but also to the development of your country
- ✓ you get invaluable work experience abroad, which helps you launch your career and becomes a stepping stone on the way to real science
- ✓ you become JINR Ambassador in Motherland and other countries by broadcasting its main mission that science brings nations together
- ✓ vacancy in JINR is waiting just for you



# **SA-JINR** cooperation



### QC Milestones South Africa – JINR

1993 First contact with Johannesburg University

1994 First cooperation agreement signed

2000 Coordination of 4 joint projects

2005 MoU between DST SA and JINR signed

2007 Fist SA-JINR Student Practice (23 students)

2012 First Student Session at SA-JINR symposium

2013 Big international conference jointly organized (IASEN-2013)

2015 Week of South Africa in JINR

2016 "10 Years review Forum"

2018 First official discussion of the Road Map

2019 Concept of "strategic projects"

2020 First joined workshop on Theory

WoS Publications Year	JINR, SA with others	JINR, SA without CERN
2007	2	2
2008	3	1
2009	3	3
2010	24	10
2011	76	14
2012	157	17
2013	116	17
2014	116	14
2015	135	13
2016	182	28
2017	151	26
2018	166	19
2019	219	30







Member of SC since 2018 Faïçal Azaiez Director iThemba LABS, SA





9-10 October 2019 Dubna. 18<sup>th</sup> meeting of JCC Key words: Strategic projects, Theory Workshop, Road Map

# International Research Infrastructure Gateway

IRI-Gateway provides a platform for South African based researchers to access large scale research infrastructure through our collaboration agreements with international research institutions such as CERN and the JINR. iThemba LABS is mandated by the DSI and NRF to coordinate the SA-CERN and SA-JINR consortia.

#### DSI

- ➤ I.Patel, Deputy Director-General, Socio-Economic Innovation Partnerships
- C. Mokonoto, Director, Research Infrastructure
- N. Ditlopo, Deputy-Director



#### NRF

- C. Nxomani, Deputy CEO
- R. Maharaj, Executive Director
- ➤ S. Manoto, Director



#### Ithemba LABS

R. Nchodu, Deputy-Director



#### **JINR**

- > G.V. Trubnikov, Director
- D.V. Kamanin, Director,
   International cooperation department
- A. Rossouw, Head of the National Group of the Republic of South Africa

#### Coordination Committee for the SA-JINR collaboration

- T. Hlatshwayo (UP), Material Research and Nanoscience (Chair);
- S. Wyngaardt (SU), Theory and Computing;
- I. Usman (Wits), Nuclear;
- A.Barnard (SU), Applied Physics;
- L. Donaldson (iThemba LABS), SAINTS Coordinator;
- G. Arendse (iThemba LABS);
- R. Nemutudi (iThemba LABS);
- A. Rossouw (JINR).



# JINR Expertise for Member States and Partner Countries

- 19 training programs for science administration implemented from April 2017 to November 2021
- 238 participants from 30 countries and one IGO (and also 2x in 2022)

S	Rectors and Vice-Rectors	14
Jniversities	Deans and directors of research units	43
-	Local contact points	57
Research organizations	Directors and vice-directors	21
	Heads of departments	52
	Local contact points/experts	33
overnments and IGO	Ministers, DG, CEO/ deputies	3
	Governmental & IGO officers	11
60	Members of JINR governing bodies	4











## **South Africa in JEMS programs**

### Total number of participants – 29 Represented organizations:

- University of Pretoria
- University of Johannesburg
- National Research Foundation
- **NECSA**
- iThemba LABS
- University of the Western Cape
- Stellenbosch University
- University of Zululand
- University of South Africa
- University of the Witwatersrand



September 2018



February 2019

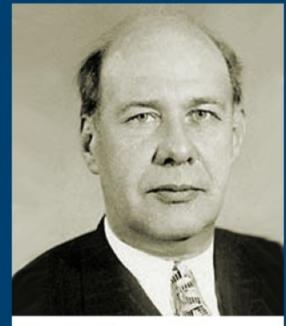


June 2019



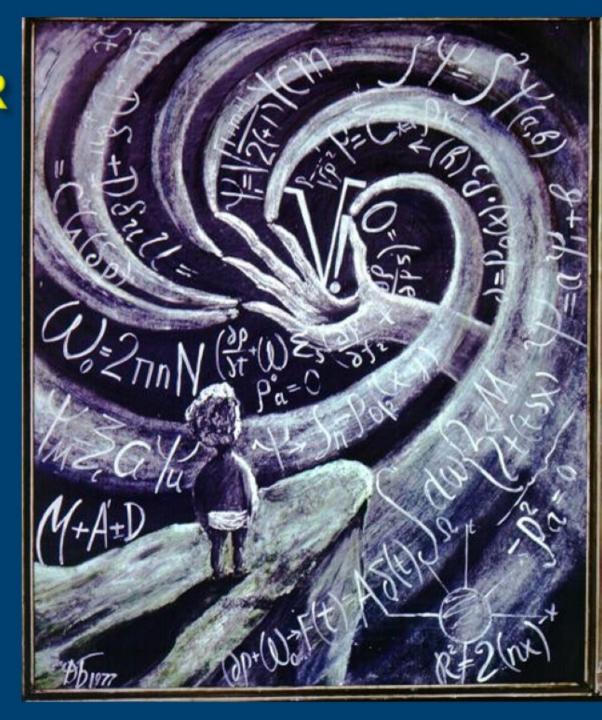
February 2020

# The first JINR director about the foundation of JINR



Dmitry Ivanovich Blokhintsev

"We go to a completely new area and do not yet know what will come of it, but history teaches that when physicists go to a new area they never come out empty-handed"



# Secure your ticket to JINR



