

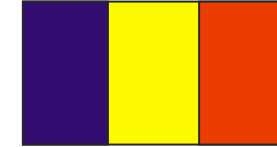
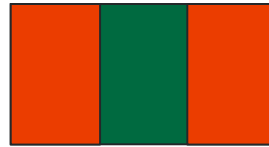
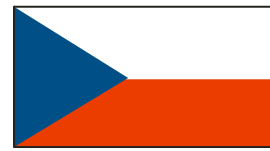
**JINR**

Joint Institute  
Nuclear for Research



***Bogoliubov Laboratory of  
Theoretical Physics***





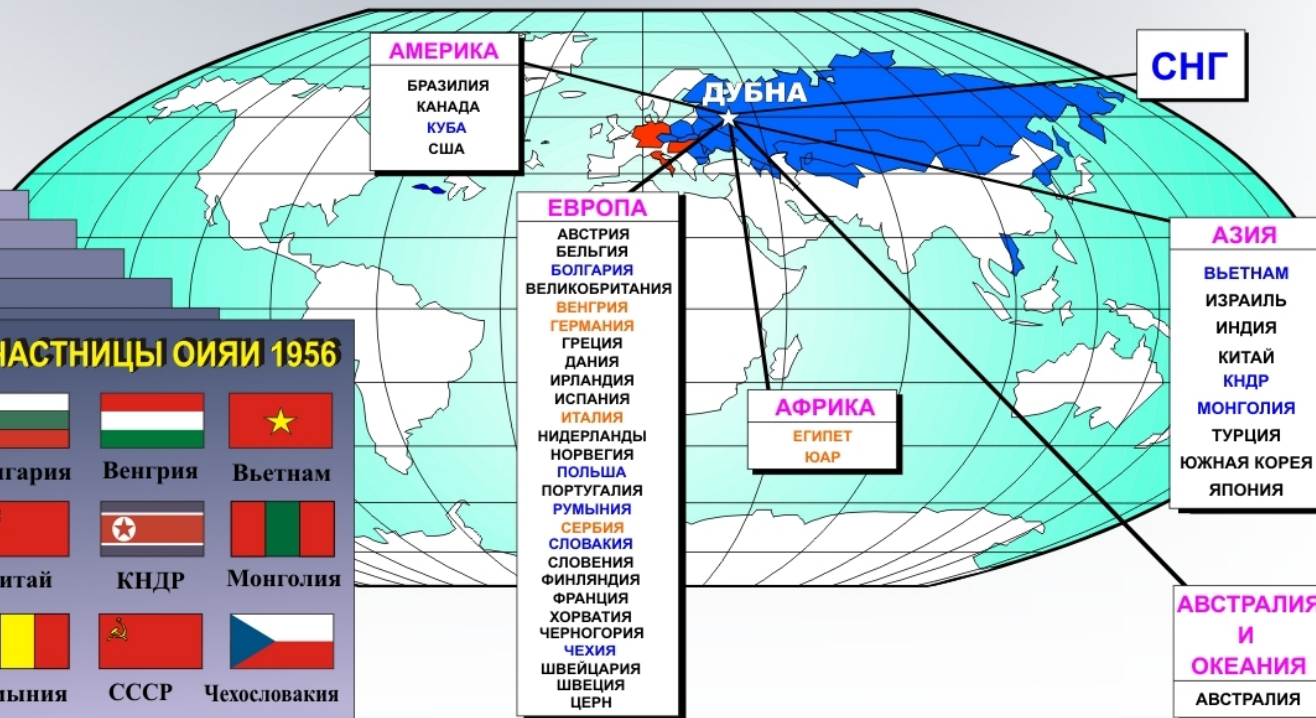
**The agreement on the establishment of JINR  
was signed on 26 March 1956 in Moscow**

# 1992 — new stage in history of JINR

## СТРАНЫ-УЧАСТНИЦЫ ОИЯИ



### СОГЛАШЕНИЯ НА ПРАВИТЕЛЬСТВЕННОМ УРОВНЕ



### СТРАНЫ-УЧАСТНИЦЫ ОИЯИ 1956



# Bogoliubov Laboratory of Theoretical Physics

## May 25, 1956



П Р И К А З  
ПО ЛИЧНОМУ СОСТАВУ ОБЪЕДИНЕННОГО ИНСТИТУТА  
№ 6  
"25" мая 1956 г.

ЗАЧИСЛИТЬ: 1. БОГОЛЮБОВА Николая Николаевича временно начальником сектора № 3 Теоретической лаборатории с окладом 6000 руб. в месяц, с 1 июня с.г.

2. ШИРКОВА Дмитрия Васильевича старшим научным сотрудником сектора № 3 Теоретической лаборатории с окладом 1500 руб. в месяц по состоянию, с 1 июня с.г.

3. МЕДВЕДЕВА Бориса Валентиновича старшим научным сотрудником сектора № 3 Теоретической лаборатории с окладом 1500 руб. в месяц по состоянию, с 1 июня с.г.

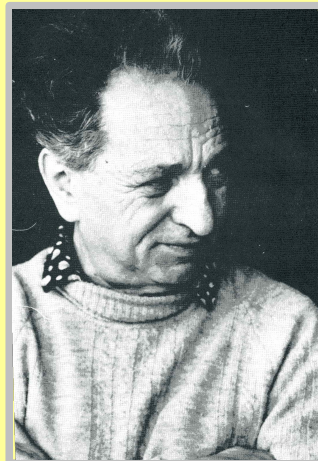
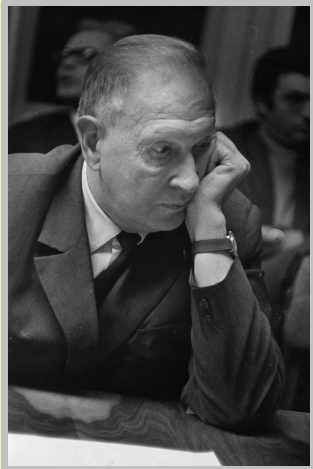
4. ПОЛИВАНОВА Михаила Константиновича научным сотрудником сектора № 3 Теоретической лаборатории с окладом 1000 руб. в месяц по состоянию, с 1 июня с.г.

ДИРЕКТОР  
ОБЪЕДИНЕННОГО ИНСТИТУТА ЯДЕРНЫХ ИССЛЕДОВАНИЙ  
Д. И. БЛОХИНЦЕВ

П Р И К А З  
ПО ЛИЧНОМУ СОСТАВУ ОБЪЕДИНЕННОГО ИНСТИТУТА  
№ 5  
"25" мая 1956 года.

До утверждения новой структуры Института возложить на академика БОГОЛЮБОВА Николая Николаевича /начальника сектора № 3 Теоретической лаборатории/ исполнение обязанностей директора Теоретической лаборатории Объединенного Института.

ДИРЕКТОР  
ОБЪЕДИНЕННОГО ИНСТИТУТА ЯДЕРНЫХ ИССЛЕДОВАНИЙ  
Б. И. БЛОХИНЦЕВ



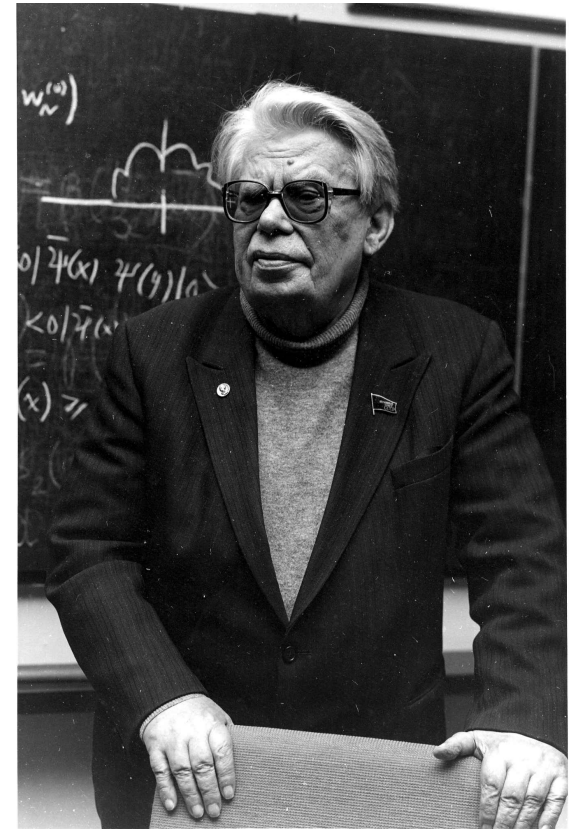


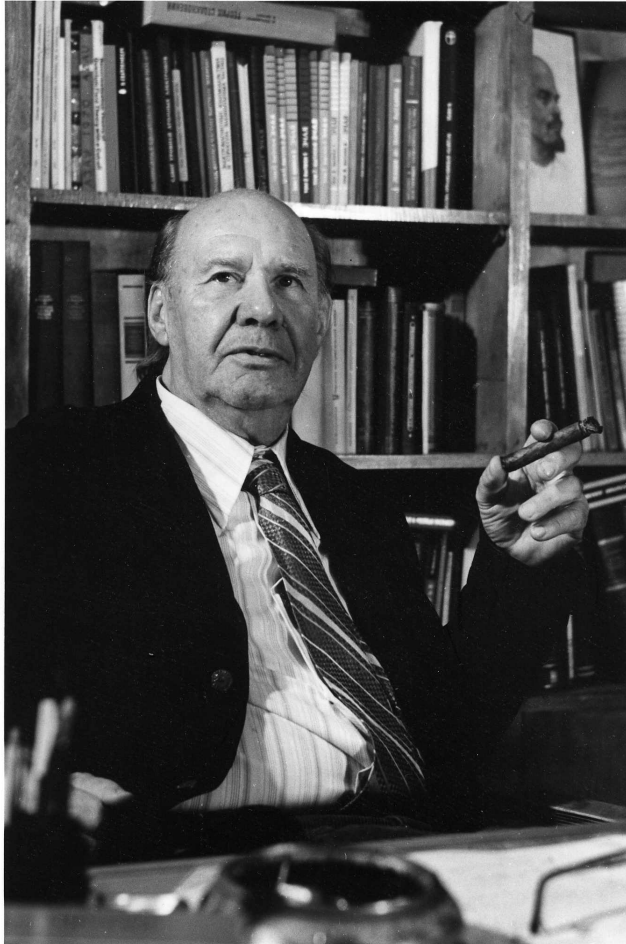
Nikolai Nikolaevich Bogoliubov (1909–1992) is a distinguished scientist in the field of physics and mathematics. His scientific activity began in Kyiv (1923–1947) and then continued in Moscow (since 1949) and Dubna (since 1956). Main scientific results in the fields:

- Nonlinear mechanics: asymptotic methods, stability theory ;
- Statistical physics: kinetic equations, quasiaverages for systems with spontaneously broken symmetries;
- Quantum statistics: microscopic theory of Bose-gas superfluidity, microscopic theory of superconductivity ;
- Quantum field theory: axiomatic scattering matrix, general renormalization theory, renormalization group theory, proof of dispersion relations;
- Elementary Particle Theory: "quark bag" model, quantum number "colour".

N.N. Bogoliubov's scientific activity began at the age of 14 –15. His major independent results were obtained when he was 20–25.

N.N. Bogoliubov's scientific activity is specified by considerable mathematical culture and directness to solution of concrete problems of natural science.





**Dmitrii Ivanovich Blokhintsev (11.01. 1908 – 27.01.1979)**, one of the pioneers of atomic science and technology in USSR, the organizer and the first director of the JINR.

Main scientific results in the fields:

- Quantum mechanics
- Acoustics of an inhomogeneous moving medium
- Neutron physics
- Quantum field theory
- Particle physics

1954 – the scientific supervisor of creation and putting into operation of the world first atomic power station.

1956- 1965 – the JINR Director

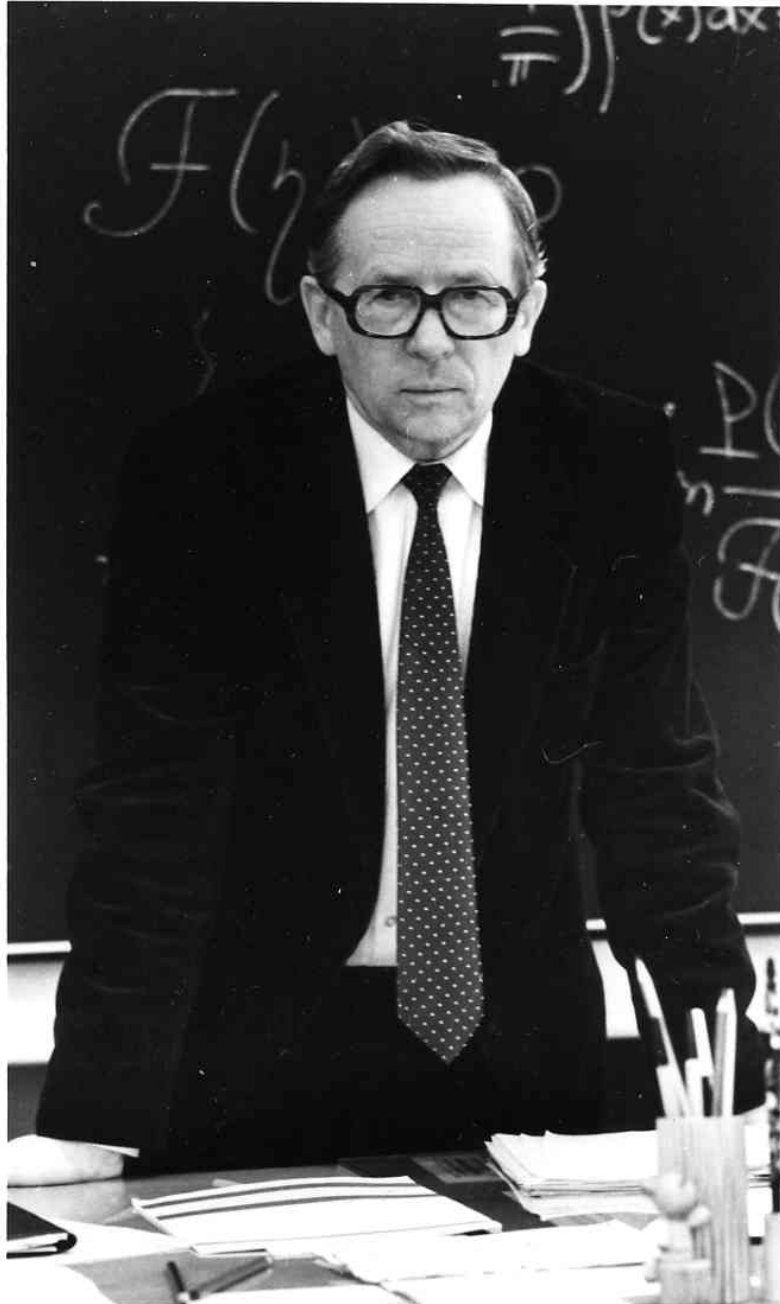
1965 – 1979 – Director of Lab of Theoretical Physics



During the 80-90s, V.I. Ogievetsky with colleagues achieved essential progress in understanding the mathematical structure of supersymmetric theories.

They worked out **the harmonic superspace method** which is now widely recognized as an adequate approach to the theories with extended supersymmetry.





At the end of the fifties, at the suggestion of N.N.Bogoliubov V.G.Soloviev studied the properties of deformed nuclei in the framework of the model of independent quasiparticles. These investigations culminated at the end of the seventies in the creation of **the quasiparticle-phonon nuclear model.**

Investigations by the Soloviev's group stimulated experimental studies in nuclear spectroscopy at JINR and in Member States and are now used in analysing data.



V.G. Kadyshevsky, A.N. Sissakian, A.T.Filippov, D.V. Shirkov

Directors of BLTP during the years 1987 - 2007



Viktor V. Voronov

BLTP: Directorate

Director **Viktor V. Voronov**

Honorary Director **Dmitrii V. Shirkov**

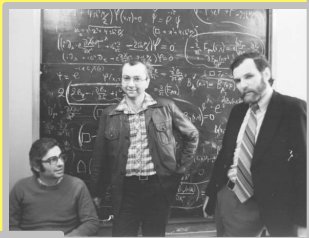
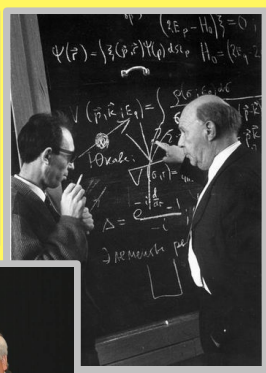
Advisor to the JINR Directorate for Theoretical Physics **Alexander T. Filippov**

Deputy Director **Alexander S. Sorin**

Deputy Director **Vladimir A. Osipov**

Deputy Director **Fedor Simkovic**

Scientific Secretary **Sergei N. Nedelko**

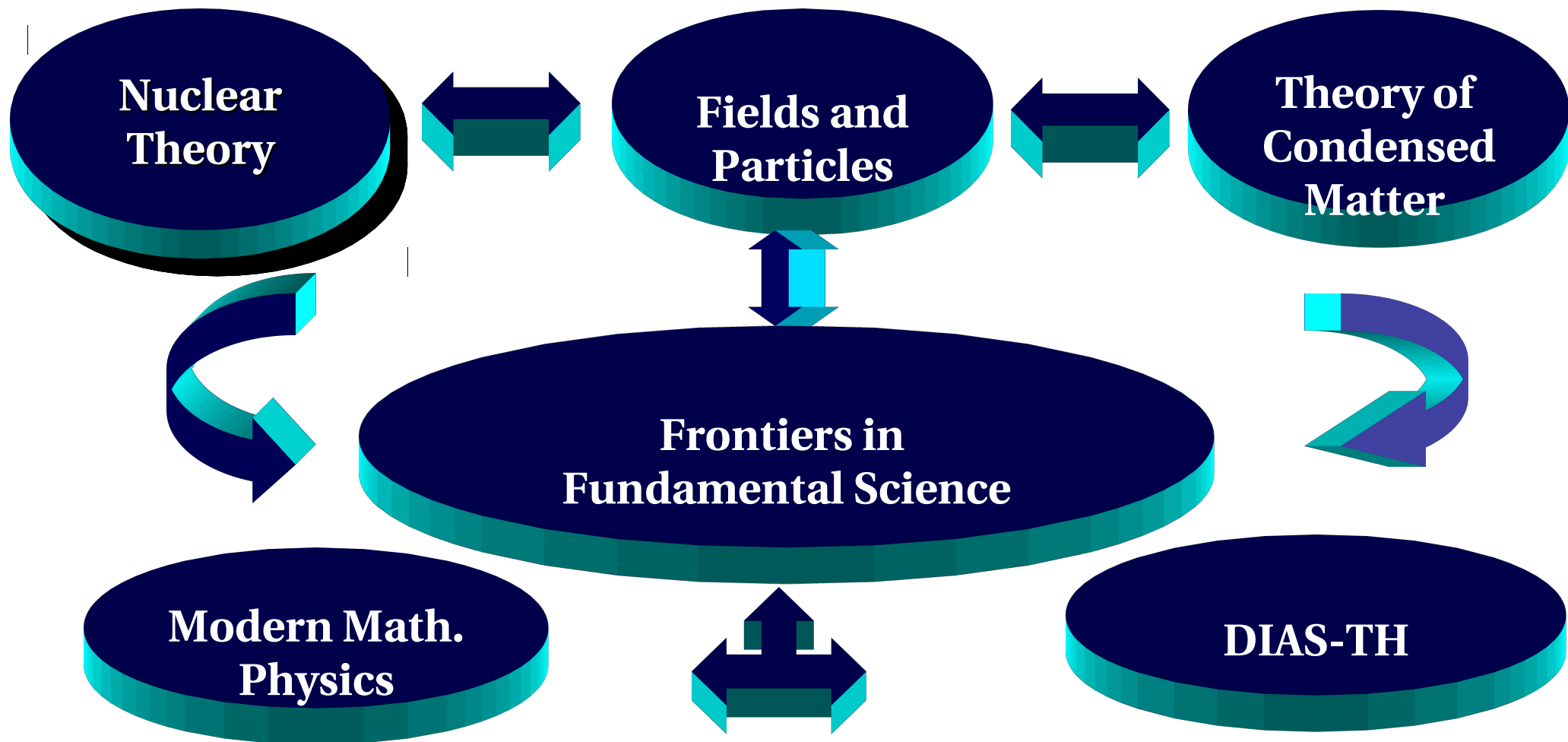


**BLTP:  
Fundamental Science  
International Cooperation,  
Education**



# BLTP's Scientific Policy

Development of research in **Theoretical Physics**  
on the basis of **Advanced Mathematics**;  
Support of the **JINR Experimental Programme**;  
Strengthening of the **efficiency of scientific staff** through  
the interplay of **Research and Education**.





***Bogoliubov Laboratory of  
Theoretical Physics***

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**Theory of Elementary Particles** *D.Kazakov, O.Teryaev*

**Nuclear Structure and Dynamics** *V.Voronov, A.Vdovin*

**Theory of Condensed Matter**

**and New Materials**

*V.Osipov, J. Brankov*

**Modern Mathematical Physics**

*A.Sorin, A.Isaev*

## Theory of elementary particles – directions of research in 2011-2016

The milestones in theoretical research in the field of particle physics at JINR will be determined by the physics programmes of major international projects (**LHC**, RHIC, FAIR, K2K, etc.) as well as by “home” experimental programmes, the **NICA/MPD** project at JINR first of all. The topics indicated in the table will be under consideration, the main attention will be paid to precision tests of the Standard Model, new physics beyond the Standard Model, hadron structure and spin physics, mixed hadronic phase and phase transitions in strongly interacting matter, spectroscopy and heavy quark physics, neutrino physics, the dark matter problem and astroparticle physics.

## **Nuclear theory - directions of research in 2011-2016**

The main direction of nuclear studies at low energies in the coming decade will be studies of the properties of **nuclei far from the valley of stability**, which is an integral part of the physics programme of the DRIBs project (JINR) and practically all existing and scheduled projects at large facilities in Europe, the USA, and Japan.

It is planned to proceed with the elaboration of nuclear structure **self-consistent microscopic models** with density-dependent effective forces, finite-range effective interactions beyond the mean-field and random phase approximations. Nuclear structure models will be applied to the prediction for the rates of weak processes in stellar matter and other **astrophysical problems**.

In the theory of reactions, collisions of **ultracold atoms and molecules in optical and magnetic traps**, and fusion reactions in crossing low-energy beams of **light nuclei channeled inside a crystal** will be investigated.

Studies of processes of **heavy-ion interactions at intermediate and high energies** will be mainly oriented to the NICA/MPD project. Nucleon and nucleus structure functions will be studied using the experimental data obtained at JINR, GSI, Jlab.



# Theory of condensed matter - directions of research in 2011-2016

Theoretical research will be focused on the analysis of **systems with strong electronic and magnetic correlations** (layered cuprates in their normal and superconducting state, transition metal oxides, in particular, magnetoresistive manganites and geometrically frustrated antiferromagnetic spinels, and fullerene clusters and lattices, etc.), which involves studies of novel cooperative phenomena, **new forms of order, low-dimensional magnetism, and quantum criticality**. Research in this field will be aimed at **supporting the experimental studies of these materials conducted at the Frank Laboratory of Neutron Physics**. Studies of the electronic, magnetic, thermal and transport characteristics of various **nanoscale materials** and nanostructures will be the key research direction. **Carbon nanostructures are of particular interest**.

# Modern mathematical physics - directions of research in 2011-2016

**Superstring theory**, the most serious and worldwide pursued candidate for the unification of all fundamental interactions including quantum gravity, will be the central topic in mathematical physics studies at BLTP.

A wide range of precise classical and quantum superstring solutions, application of modern mathematical methods to the fundamental problems of **supersymmetric gauge theories**, development of microscopic description of **black hole physics**, elaboration of **cosmological models of the early Universe** will be studied. To apply and develop new ideas generated with the string theory, it is crucial to use mathematical methods of the **theory of integrable systems, quantum groups and noncommutative geometry**.



| [1994](#) | [1995](#) | [1996](#) | [1997](#) | [1998](#) | [1999](#) | [2000](#) | [2001](#) | [2002](#) | [2003](#) | [2004](#) | [2005](#) |  
[2006](#) | [2007](#) | [2008](#) | [2009](#) | [2010](#) | **2011**

January 24 - 27, Protvino  
*International Conference*  
**[Classical and Quantum Integrable Systems](#)**

January 30 - February 6  
**[IX<sup>th</sup> Winter School on Theoretical Physics](#)**

March 10 - 11  
*Symposium*  
**[JINR at the Centenary of Atomic Nucleus](#)**

April 1 - 30  
*XV<sup>th</sup> Research Workshop*  
**[Nucleation Theory and Applications](#)**

April 11, Sofia, Bulgaria  
**[International Conference on Physics](#)**  
In Memoriam Acad. Prof. Matey Mateev

May 2 - 9, Prague, Czech Republic  
*Advanced Study Institute*  
**[Symmetries and Spin](#)**

May 15 - 20  
*The 5<sup>th</sup> APCTP-BLTP JINR Joint Workshop*  
**[Frontiers in Nuclear Physics at Dubna](#)**

July 12 - 16, Dubna and July 25 - 29,  
Yerevan, Armenia  
*XV International Conference*  
**[Symmetry Methods in Physics](#)**  
dedicated to A.N.Sissakian

July 18 - 23  
*International Workshop*  
**[Supersymmetries and Quantum Symmetries](#)**

July 24 - August 2  
*Helmholtz International School*  
**[Nuclear Theory and Astrophysical Applications](#)**

August 7 - 13, Prague, Czech Republic  
*7 International Conference*  
**[Quantum Theory and Symmetries](#)**

September 5 - 17  
*Helmholtz International School*  
**[Lattice QCD, Hadron Structure and Hadronic Matter](#)**

September 20 - 24  
*XIV<sup>th</sup> International Workshop on*  
**[High Energy Spin Physics](#)**

October 4 - 7  
*International Conference*  
**[Advances of QFT](#)**

October 11 - 15  
*International Workshop*  
**[Bogoliubov Readings](#)**

December 5 - 9  
*4-th Workshop on*  
**[Precision Physics and Fundamental Physical Constants](#)**

# AGREEMENTS

- BLTP – ICTP (since '88)  
1.5 month per year
- BLTP – Germany (since '91)  
Heisenberg–Landau Program
- BLTP – INFN (since XII '95)  
6 month visits to Italy
- BLTP – CERN-TH (since XII '95)  
3 month visits to CERN
- BLTP – Poland (since XII '98)  
Bogoliubov–Infeld Program
- BLTP – Czechia (since XII '99)  
Blokhintsev –Votruba Program
- BLTP – Romania (since XII '03)  
Titeica – Markov Program

**BLTP-APCTP (since'07)**

**BLTP-Bulgaria (since'09)  
Soloviev-Khristov Program**

**BLTP – IOP VAST, Vietnam (since '11)**

**DUBNA**

**JINR**

**BLTP**

**Welcome!**

