3.1 Structure of Laboratory and Scientific Divisions

Directorate

Director	*A.N.Sissakian*
Honorary Director	*D.V. Shirkov*
Advisor to the JINR Directorate for Theoretical Physics	*A.T. Filippov*
Vice-Director	*D. Blaschke*
Vice-Director	*A.S. Sorin*
Vice-Director	*V.V. Voronov*
Scientific Secretary	*V.I. Zhuravlev*

SCIENTIFIC DIVISIONS

I. Modern Mathematical Physics
Leaders: *A.T. Filippov, A.I. Isaev*

II. Fields and Particles
Leaders: *D.I. Kazakov, O.V.Teryaev*

III. Theory of Nuclei and Other Finite Systems
Leaders: *V.V. Voronov, R.V. Jolos*

IV. Theory of Condensed Matter
Leaders: *N.M. Plakida, V.B. Priezzhev*

Computer Facilities
Head: *A.A. Sazonov*

Administrative & Technical Services
Head: *V.I. Babchik*

SCIENTIFIC DIVISIONS

At BLTP, studies are organized within four themes approved at the 93rd Session of the JINR Scientific Council: Modern Mathematical Physics, Fields and Particles, Theory of Nuclei and Other Finite Systems, Theory of Condensed Matter. The themes are divided into the projects. Below, information about each theme and project is presented.

I. Modern Mathematical Physics

Leaders: *A.T Filippov, A.P. Isaev*

Activity or Project

1. Quantum Groups and Integrable Systems

Spokespersons: *A.P. Isaev, A.A. Vladimirov*
Principal researchers

R.M. Mir-Kasimov
S.Z. Pakulyak
A.D. Popov
P.N. Pyatov
S.M. Sergeev
S.V. Shabanov
C. Sochichiu
V.P. Spiridonov
N.A. Tyurin

Main topics

- Integrable models in quantum field theory and gravitation;
- Topological field theory;
- Integrable equations in spin models;
- Quantum groups and their representations;
- Quantum deformations of infinite dimensional algebras;
- Quantum space and noncommutative differential geometry.

2. Supersymmetry

Spokesperson*: E.A. Ivanov*
Principal researchers

S.O. Krivonos
A.I. Pashnev
A.O. Sutulin
M.M. Tsulaia
B.M. Zupnik

- Method of harmonic superspace;
- Integrable systems with extended supersymmetry;
- Symmetries of extended objects;
- Geometrical and algebraic structure of gauge systems.

3. Quantum Gravity, Cosmology and Strings

Spokespersons*: A.T. Filippov, V.V. Nesterenko, A.S. Sorin*
Principal researchers

B.M. Barbashov
V.B. Deryagin
B. Dimitrov
D.V. Fursaev
T.A. Ivanova
A.B. Pestov
I.G. Pirozhenko
A.D. Popov
E.A. Tagirov

- Low dimensional integrable models of quantum (super) gravity and cosmology;
- Toda lattice hierarchies with extented supersymmetry and integrable structure of string field teories;
- Methods of spectral geometry and their applications to quantum gravity;
- Lagrange systems with explicit nonholonomic constrains and their quantization.

II. Fields and Particles

Leaders: *D.I. Kazakov, O.V. Teryaev*

Activity or Project

1. Standard Model and Its Extensions

Spokespersons: *D.I. Kazakov, E.A. Kuraev*
Principal researchers

A.B. Arbuzov	*G.A. Kozlov*
S.M. Bilenky	*V.A. Naumov*
A.V. Gladyshev	*M.N. Tentyukov*
A.V. Kotikov	*M. Yurchishin*

- Prediction of the mass spectrum of supersymmetric partners;
- Production and decay of *s*-particles;
- Possibility of detecting the supersymmetry in experiments;
- Renormalization in softly broken supersymmetric gauge theories;
- Multiloop calculations in QCD, Standard Model and its extensions;
- Verification of the factorization in inelastic large angle processes;
- Radiation corrections to the Pomeron trajectory.

2. QCD: Spin Effects and Sum Rules

Spokespersons: *A.V. Efremov, O.V. Teryaev*
Principal researchers

A.P. Bakulev	*S.V. Mikhailov*
S.V. Goloskokov	*A.V. Radyushkin*
P.S. Isaev	*O.V. Selyugin*
G.P. Korchemskii	*A.V. Sidorov*

- Spin structure of the nucleon;
- Jet handedness;
- Single spin asymmetry;
- T-odd spin effects;
- Spin effects in diffraction region;
- QCD sum rules and vacuum structure;
- Deeply virtual Compton scattering.

3. Nonperturbative Methods in QFT

Spokesperson: *D.V. Shirkov*
Principal researchers

T.D. Bakeev	*A.V. Nesterenko*
V.K. Mitrjushkin	*I.L. Solovtsev*

- Analytic approach in QCD, nonperturbative contributions, renormalization scheme, and higher-loop stability;
- Phenomenological applications of the analytic approach ;
- Nonperturbative variational expansions in quantum field theory;
- Analytical and numerical studies in QCD and QED with lattice regularization.

4. Symmetries and Gauge Theories

Spokespersons: *V.N. Pervushin, A.N. Sissakian*

Principal researchers

N.A. Chernikov *D.V. Proskurin*
D. Mladenov *Yu.S. Surovtsev*
G.S. Pogosyan *S.I. Vinitsky*

- Superintegrable systems in spaces with constant curvature and the Hurvitz transformation;
- Reduction in non-Abelian constrained systems;
- Topological propertis of the reduced phase space;
- Hamiltonian dynamics and quantization of cosmological models.

5. Quantum Field Models of Heavy Quarks

Spokespersons: *M.A. Ivanov, S.N. Nedelko*

Principal researchers

G.V. Efimov *G. Ganbold*
S.M. Eliseev *V.I. Korobov*
P. Flin

- Schwinger-Dyson and Bethe-Salpeter equations;
- Physics of heavy quarks, spin-flavor symmetry;
- Electromagnetic structure of hadrons and hadronic atoms.

6. Low Energy Quark Models of Light Hadrons

Spokespersons: *D. Blaschke*[1)], *M.K. Volkov*

Principal researchers

I.V. Anikin *N.I. Kochelev*
I.O. Cherednikov *V.A. Meshcheryakov*
A.E. Dorokhov *V.L. Yudichev*
S.B. Gerasimov

1) Rostock University, Rostock, Germany

- Ground and excited states in the chiral quark model;
- Meson properties in hot and dense media;
- Confinement and structure of the QCD vacuum;
- Narrow dibaryons, exotic multiquark resonances.

III. Theory of Nuclei and Other Finite Systems

Leaders: V.V. Voronov, R.V. Jolos

1. Nuclear Structure under Extreme Conditions

Spokespersons: *D. Karadjov*[1)], *V.V.Voronov, A.I. Vdovin*
Principal researchers

G.N. Afanasiev
E.B. Balbutsev
V.A. Kuz'min
L.A. Malov
I.N. Mikhailov
V.O. Nesterenko
V.Yu. Ponomarev
V.M. Shilov
A.V. Sushkov

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1) Institute for Nuclear Research and Nuclear Energy, Sofia, Bulgaria

- Microscopic nuclear models beyond RPA;
- Nonlinear dynamics of large amplitude nuclear collective motion;
- New methods of finite temperature many-body theory;
- Nuclear properties at the drip line;
- Multi-phonon states in nuclei and metal clusters;
- Vibrational excitations built on superdeformed, compound, and isomeric states;
- Spin-flip excitations in nuclei and metal clusters;
- Nuclear structure in semi-leptonic processes.

2. Dynamics and Manifestation of Structure in Nuclear and Mesoscopic Systems

Spokespersons: *R.V. Jolos, V.V. Pashkevich*
Principal researchers

N.V. Antonenko
S.N. Ershov
S.I. Fedotov
F.A. Gareev
V.G. Kartavenko
A.K. Nasirov
R.G. Nazmitdinov
V.P. Permyakov

- Multimodal structure of nuclear fission;
- Fusion of massive nuclei and the mechanism of superheavy element production;
- Mechanism of production of exotic nuclei in reactions with radioactive beams at Fermi energy per nucleon;
- Structure of nuclei with neutron halo;
- Nuclear clusters, super- and hyperdeformation of nuclei;
- Possibility of different proton - neutron deformations in nuclei far from stability;
- Dynamic symmetries and chaos in nuclei;
- Exotic collective excitations (quantum vortices, nonlinear surface modes, neck vibrations);
- Properties of mesoscopic systems.

3. Few-Body Physics

Spokespersons: *V.B. Belyaev, A.K. Motovilov, J. Revai*[1)]
Principal researchers

S.S. Kamalov
M.Kh. Khankhasaev
E.A. Kolganova
A.V. Matveenko
V.M. Pen'kov
V.V. Pupyshev
N.V. Shevchenko

- Investigation of the fundamental properties of few-particle quantum systems within mathematically rigorous approaches;
- Development of approximate methods for solving few-body problems in nuclear and molecular physics and astrophysics;
- Study of exotic nuclei, atoms, and molecules: hypernuclei, eta-nuclei, antiprotonic atoms, muonic atoms, and molecules;
- Study of the influence of near-threshold nuclear resonances on properties of molecular systems;
- Study of electro- and photoproduction mechanisms of π- and η-mesons off lightest nuclei and double charge-exchange of pions on light and itermediate nuclei.

1) Central Research Institute for Physics HAS, Budapest, Hungary

4. Relativistic Nuclear Dynamics

Spokespersons: *V.V. Burov, V.K. Lukyanov*
Principal researchers

S.G. Bondarenko *V.D. Toneev*
V.M. Chabanov *S.S. Semikh*
L.P. Kaptari *B.N. Zakhariev*
A.I. Titov

- Study of variety of nuclear matter properties and their manifestation in dynamics of nuclear collisions;
- Quark-hadron deconfinement transition, chiral symmetry restoration, and nuclear liquid-gas-like transition;
- Dilepton and vector meson production in reactions with polarized particles as a probe for nuclear exotics and for nucleon structure including its hidden strangeness;
- Investigation of kaon-nuclei interaction;
- The NN-interactions at short distances and nuclear dynamics;
- Development of the high-energy approach for direct nuclear collisions;
- Study of relativistic effects in elastic, inelastic, and deep inelastic lepton-, hadron- and nuclei scattering, and in processes of the deutron disintegration as well;
- Nonnucleon and colour degrees of freedom in nuclei;
- Development and application of the field theory for extended field configurations.

IV. Theory of Condensed Matter

Leaders: N.M. Plakida, V.B. Priezzhev

1. Strongly Correlated Systems

Spokespersons: *N.M. Plakida , G. Röpke*[1)]
Principal researchers

W. Kleinig *N.B. Perkins*
A.L. Kuzemsky *J. Schmelzer*
V.A. Moskalenko *V.S. Shakhmatov*
V.S. Oudovenko *V.Yu. Yushankhai*

1) Rostock University, Rostock, Germany and JINR, BLTP

- Electronic spectra and superconductivity in unconventional metals with strong electron correlations ;
- Polaronic effects in systems with strong electron-lattice and spin interactions;
- Quantum theory of itinerant and localized magnetism;
- Charge, orbital, and magnetic ordering and quasiparticle spectra in magnetic oxides;
- Many-particle systems with strong correlations,nucleation, and spinodal decomposition.

2. Dynamic Systems: chaos, integrability, and self-organization
Spokesperson: *V.B. Priezzhev*
Principal researchers

L. Alexandrov *A.M. Povolotsky*
V.I. Inozemtsev *V.N. Plechko*
T.A. Ivanova *K.V. Rerikh*
V.K. Mel'nikov *P.E. Zhidkov*

- Self-organized criticality;
- Integrable systems;
- Inverse scattering problem.

3. Disorded Structures: glasses, topological defects, nanostructures, and Josephson junction
Spokesperson: *V.A. Osipov*
Principal researchers

E.A. Kochetov *S.A. Sergeenkov*
S.E. Krasavin

- Structural, spin, and superconductive glasses;
- Topological defects in membranes and nanostructures;
- Josephson junctions and granular superconductors.

4. Mesoscopic and Coherent Phenomena in Quantum Systems
Spokespersons: *M.A. Smondyrev, V.S. Yarunin*
Principal researchers

E.N. Bukina *V.M. Dubovik*
A.Yu. Cherny *A.A. Shanenko*
A.V. Chizhov *V.I. Yukalov*

- Quasiparticle spectra in quantum wells, wires, and dots;
- Effects of electron-phonon interactions in polar materials;
- Mesoscopic fluctuations and transient coherence in nonequilibrium systems;
- Bose-Einstein condensation in quantum liquids;
- Photon confinement in band-gap materials;
- Applications of the scale-separation, self-similar approximation and other nonperturbative methods to strongly nonequilibrium and strongly interacting systems;
- Toroid polarizations and nonlinear coherent phenomena.

3.2 Seminars

A list of regular weekly seminars of BLTP is given below.

- NUCLEAR THEORY – Monday
  (heads: V.V. Voronov, R.V. Jolos)
- Problems of Supersymmetries – Monday
  (head: E.A. Ivanov)
- MODERN MATHEMATICAL PHYSICS – Tuesday
  (heads: A.T. Filippov, A.P. Isaev)
- STATISTICAL MECHANICS – Tuesday
  (heads: N.M. Plakida and V.B. Priezzhev)
- Quantum Field Theory – Wednesday
  (head: D.I. Kazakov)
- LABORATORY SEMINAR – Thursday
  (heads: A.N. Sissakian, D. Blaschke, A.S. Sorin and V.V. Voronov)
- FIELDS AND PARTICLES – Thursday
  (heads: D.I. Kazakov, O.V. Teryaev)
- Hadron Physics – Friday
  (heads: S.B. Gerasimov, A.E. Dorokhov, and E.A. Kuraev)
- Symmetries and Integrable Systems – Friday
  (head: A.N. Sissakian)
- Mathematical Problems of Theoretical Physics – Friday
  (head: V.B. Priezzhev)

3.3 Conferences and Meetings

2001

1. V-th Research Workshop "Nucleation Theory and Applications",
   (Dubna, April 2 – 28). Supported by the Heisenberg – Landau Programme (HLP), the UNESCO Regional Bureau for Science in Europe (UNESCO-ROSTE), and Russian Foundation for Basic Research (RFBR).
2. IX-th International Conference on Supersymmetry and Unification of Fundamental Interactions, *(Dubna, June 11 – 17). Supported by HLP, the Bogoliubov-Infeld Programme (BIP), UNESCO-ROSTE, RFBR, and Russian Academy of Sciences.*
3. International Workshop and School "Quantum Gravity and Superstrings",
   (Dubna, June 18 – 28). Supported by HLP, BIP, BMBF (Germany), UNESCO-ROSTE, INTAS, and RFBR.
4. X-th International Colloquium "Quantum Groups and Integrable Systems",
   (Prague, Czech Republic, June 21 – 23),), jointly organized by the BLTP, Czech Technical University, Charles University, and LPTMC, University Paris 7. Supported by the Blokhintsev-Votruba Programme (BVP).
5. IX-th International Conference "Symmetry Methods in Physics",
   (Yerevan, Armenia, July 3 – 8). Supported by HLP, BIP, UNESCO-ROSTE, ICTP,

INTAS, Ministry of Science and Technology of the Russian Federation, Ministry of Science and Education of the Republic of Armenia, Yerevan State University, and RFBR.

6. IX-th International Workshop on High Energy Spin Physics, *(Dubna, August 2–7).Supported by HLP, BIP, UNESCO-ROSTE, International Committee on Spin Physics, and RFBR.*
7. DAAD Summer School on Dense Matter in Particle and Astrophysics, *(Dubna, August 20 – 31*).
8. International Workshop "Supersymmetries and Quantum Symmetries", *(Karpacz, Poland, September 17 – 21). Supported by BIP*
9. International Conference "New Trends in High Energy Physics", (*Yalta, Crimea, Ukraine, September 22 – 29).*

2002

1. International Workshop "New Models and Nuclear Methods in Biophysics and Biochemistry", *(Dubna, January 24 – 26).*
2. V-th International Conference "Renormalization Group 2002", *(High Tatras, Slovakia, March 10 – 16).*
3. VI-th Research Workshop "Nucleation Theory and Applications", *(Dubna, April 4 – 28). Supported by UNESCO-ROSTE, HLP, and RFBR.*
4. V-th International School on Heavy Quark Physics, *(Dubna, May, 27 – June 5). Supported by BMBF and RFBR.*
5. XVI International Seminar on High Energy Physics Problems, *(Dubna, June 10 – 15), jointly organized by LHE and BLTP. Supported by Ministry of Science and Technology of the Russia and RFBR.*
6. XI International Colloquium "Quantum Groups and Integrable Systems", *(Prague, Czechia, June 20 – 22), jointly organized by the BLTP, Czech Technical University, Charles University, and LPTMC, University Paris 7. Supported by the Blokhintsev-Votruba Programme.*
7. International Workshop "Quantum Gravity and Superstrings", *(Dubna, July 11 – 18). Supported by HLP, BVP, BIP, UNESCO-ROSTE, and RFBR.*
8. DAAD Summer School on Quantum Statistics of Many-Particle Systems, *(Dubna, July 21 – August 10).*
9. International Symposium on Nuclear Clusters: from Light Exotic to Superheavy Nuclei, *(Hessen, Germany, August 5 – 9). Supported by HLP. (Dubna, July 31 – August 5). Supported by IUPAP, INTAS, UNESCO, RFBR, HLP, and Bogoliubov – Infeld Programme.*
10. XXXII International Symposium on Multiparticle Dynamics, *(Alushta, Crimea, Ukraine, September 7 – 13). Supported by Ministry of Science and Technology of the Russia, UNESCO-ROSTE, BIP and RFBR.*

3.4 International Collaboration

The BLTP actively collaborates with scientific centres of the JINR Member States and other countries. In addition to the well-established and broad collaboration with German theorists based on the Heisenberg–Landau Programme (see the table below for details), in

2001–2002, collaboration with the INFN sections (Italy), IN2P3 Institutes (France), CERN TH, and ICTP. was continued. In 2001–2002, the collaboration with Polish theorists was based on the Bogoliubov–Infeld Programme and with Czech theorists, on the Blokhintsev–Votruba Programme.

Number of Visits to BLTP

From	2001		2002	
	< 3 months	3–6 months	< 3 months	3–6 months
Member States	42	17	43	22
Other Countries	37		44	
Total	**96**		**109**	

Comment: without visits from Russia and conferences not included

Number of Visits of BLTP researchers

to	2001	2002
Member States	117(68)	108(54)
Other Countries	241(47)	260(74)
Total	**358(115)**	**368(128)**

Comment: including visits to conferences indicated in brackets

Statistical Overview on the Heisenberg–Landau Programme

Year	Expenditure	Number of supported		Number of visits		Number of Joint Papers
		Workshops & Schools	Research Projects	from Germany	to Germany	
2001	195 kDM	6	31	63	107	87
2002	107 T€	5	32	66	110	91

Comment: funds allocated by Germany in the framework of the agreement between JINR and BMBF for investigations on theoretical physics amounted to 270 kDM for 2001 including 65 kDM for equipment and for 2002 were 138 T€, including 31 T€ for equipment.

3.5 Teaching

Many theorists of the BLTP supervise the diploma theses of students from the JINR University Centre, Universities of Moscow and other cities. At the BLTP, there are post-graduate students not only from the JINR University Centre but also from other Institutes.

During the period of 2001–2002 12 candidate theses were defended under the supervision of BLTP theorists (see the list of candidate dissertations on pages 196, 197).

Below, there is the list of courses of lectures, given by the BLTP theorists during the last years.

1. D.V. Shirkov – *"Quantum fields",* Physics Department of Moscow State University (MSU), from 1971 up to now.
2. V.A. Meshcheryakov – *"Dispersion relations in particle physics"; "Quantum field theory on the basis of path integral"*, MSU, from 1995 up to now.
3. A.V. Efremov – *"Theoretical and Applied Mechanics"*, MIREA, Dubna branch; *"Theory of fundamental interactions: QCD and Standard Model",* JINR UNC.
4. E.A. Kuraev, – "*Mathematical Physics"*, MIREA, Dubna branch,
5. D.I. Kazakov – *"Quantum Field Theory",* Moscow Physical & Technical Institute, from 1999 up to now.
6. D.V. Fursaev – *"Introduction to gravity and physics of black holes",* 2 weekly seminars for students, ITEP, Moscow.
7. S.I. Vinitsky – *"Computational methods of quantum mechanics"*, Tver State University, from 1997 up to now.
8. G.V. Efimov – *"Quantum Field Theory and Particle Physics"*, Department of Theoretical Physics, Ivanovo State University, from 1997 up to now.
9. V.K. Mitrjushkin – *"Quantum Filed Theory on the Lattice",* MSU, from 1999 up to now.
10. A.I. Vdovin – selected topics of the course *"Theory of nuclear structure and nuclear reactions",* JINR UNC, 2001–2002.
11. N.V. Antonenko – "*Theory of nucleus"* and "*Theory of nuclear reactions"* , JINR UNC, 2001–2002.
12. R.V. Jolos – "*Heavy ions collisions",* JINR UNC, 2001–2002.
13. V.N. Pervushin – "*Hamiltonian cosmology",*JINR UNC, 2002.
14. B.N. Zakhariev, V.M. Chabanov – lectures and practical exercises on selected topics of the course *"Quantum mechanics"* at Kostroma University, 2001–2002.
15. V.A. Osipov – *"Biophysics",* International University "Dubna", 2001–2002.
16. A.V. Gladyshev – Discussion leader at the European School of High-Energy Physics, Pylos, Greece, 25.08 – 7.09.2002.
17. A.A. Vladimirov – "*Methods of Modern Field Theory",* a set of lectures at BLTP, JINR, during 2002.

Another important aspect of the teaching activity is organization of schools for young scientists (see the list on pages 192, 193).

3.6 Presentation of Theses

Doctor of Physics and Mathematics

2001

1. S.M. Sergeev (BLTP) – November 19
   "Completely integrable discrete 3-dimensional systems".
   The thesis presented at Steklov Mathematical Institute, St. Petersburg.
2. A.V. Sidorov (BLTP) – November 21
   "Analysis of the structure functions g_1 *and* F_3 *in high order of*

the QCD perturbative theory".

2002

1. F.M. Pen'kov (BLTP) – June 5
   "Effective long-range interaction in few-body systems".
2. E.A. Kochetov (BLTP) – December 25
   "Path integrals on group orbits".
3. N.A. Tyurin (BLTP) – December 26
   "Geometric quantization in the algebraic lagrangian geometry".
   The thesis presented at Steklov Mathematical Institute, Moscow.

Candidate of Physics and Mathematics

2001

1. A.P. Severyukhin (BLTP) – May 16
   "Ground state correlations and vibrational excitations in nuclei".
   Supervisor: V.V. Voronov
2. S.V. Kryukov (BLTP) – June 27
   "Symmetries of quantum integrable systems".
   Supervisor: V.I. Inozemtsev
3. S.S. Semikh (BLTP) – June 27
   "Mass spectrum of the Bethe-Salpeter equation and relativistic effects in pd-scattering".
   Supervisors: L.P. Kaptari, S.M. Dorkin.
4. A.M. Povolotsky (BLTP) – June 27
   "Avalanche processes in the theory of self-organized criticality".
   Supervisor: V.B. Priezzhev
5. M.V. Rzjanin (BLTP) – October 24
   "Nuclear structure in electromagnetic and strong interactions".
   Supervisors: V.V. Burov, G.I. Lykasov
6. V.B. Deryagin (BLTP) – December 19
   "Discrete symmetries of integrable systems".
   Supervisor: A.N. Leznov
7. M. Jurčišin (BLTP) – December 19
   "Mass predictions in theMSSM based on infrared quasifixed points".
   Supervisor: D.I. Kazakov
8. Yu.V. Palchikov (BLTP) – December 26
   "Pairing correlations, quadrupole excitations and the cluster properties in nuclear structure".
   Supervisor: R.V. Jolos

2002

1. N.V. Shevchenko (BLTP) – February 27
   "Interaction of η-mesons to light nuclie".
   Supervisors: V.B. Belyaev, S.A. Rakityansky
2. A. Yu. Illarionov (LHE, JINR) – April 24
   "Deutron structure at small N-N distances and its interaction to hadrons".
   Supervisor: G.I. Lykasov
3. A.S. Parvan (BLTP) – June 26

"Nuclear multifragmentation in the statistical approach".
Supervisors: V.D. Toneev, K.K. Gudima

4. D.M. Mladenov (BLTP) – October 30
"Many-particle integrable models in the gauge theories and gravity".
Supervisors: V.N. Pervushin, A.M. Khvedelidze

3.7 Grants

Russian Programme of supporting leading scientific schools

- D.V.Shirkov, D.I. Kazakov, A.V. Gladyshev, I.L. Solovtsov, V.N. Velizhanin, et al. – 00-15-96691, (2000 – 02).
- A.M. Baldin, V.V. Burov, S.G. Bondarenko, S.B. Gerasimov, L.P. Kaptari, V.K. Lukyanov, A.I. Titov, M.V. Rzjanin et al. – 00-15-96737, (2000 – 02).
- A.A. Logunov, …, I.O. Cherednikov, et al. – 00-15-96577, (2000 – 02).

State Grants (01.04. 2000 – 31.03. 2003)

B.M. Barbashov,V.B. Belyaev, A.V. Efremov, S.B. Gerasimov, D.I. Kazakov, N.M. Plakida, V.V. Voronov, I.G. Pirozhenko (for young scientists).

Russian Foundation for Basic Research (RFBR)

1. D.I. Kazakov, A.V. Gladyshev, M. Jurcisin, V.N. Velizhanin, A.A.~Sheplyakov – *Supersymmetric extensions of the Standard Model: theory and phenomenology*, RFBR 02-02-16889, (2002– 04).
2. A.V. Efremov, I.V. Anikin, A.P. Bakulev, S.V. Goloskokov, S.V. Mikhailov, O.V. Teryaev, A.V. Sidorov – *Quantum chromodynamics of spin processes ,* RFBR 00-02-16696, (2000 – 02).
3. A.V. Kotikov (4 participants, leader N.P. Zotov) *Small x physics and the study of gluon dynamics in ep and pp processes at HERA and TEVATRON energies and above,* RFBR 02-02-17513, (2002 –04).
4. I.L. Solovtsov, O.P. Solovtsova (3 participants, leader D.V. Shirkov) – *Nonperturbative methods in theory of quantized fields*, RFBF 02-01-00601, 2002–04.
5. V.V. Nesterenko, I.G. Pirozhenko – *Spectral zeta functions in quantum field theory and quantum gravity,* RFBR 00-01-00300, (2000 – 02).
6. D.V. Fursaev – *Investigation of statistical properties of black hole thermodynamics in the theory of induced gravity,* RFBR 99-02-18146, (1999 – 2001).
7. E.A. Tagirov – *Quantum mechanics on the general Riemannian space-time manifold,* RFBR 00-01-00871, (2000 – 02).
8. A.T. Filippov, A.P. Isaev, S.Z. Pakuliak, P.N. Pyatov, V.P. Spiridonov, A.A.Vladimirov, V.G. Ivanov – *Integrable field-theory models and quantum algebras*, RFBR 00-01-00299, (2000 – 02).
9. V.K. Mitrjushkin, et al. – *Fermions in lattice gauge theories,* RFBR 99-01-01230, (1999 – 2001).
10. I.L. Solovtsov, O.P. Solovtsova, A.N. Sissakian, et al. – *Hadron properties and nonperturbative methods of QCD,* RFBR 99-02-17727, (1999 – 2001).
11. T. Bakeyev, (leader A.A. Slavnov) – *Nonperturbative methods of quantum gauge theory*, RFBR 02-01-00126, (2002–04).

12. E. Ivanov, S. Krivonos, A. Sorin, B. Zupnik, A. Pashnev, M. Tsulaia – *Supersymmetry in field theory and quantum mechanics, integrable systems and p-branes,* RFBR-99-02-18417 (2001).
13. G.V. Efimov, M. Ivanov, S. Nedelko – *Quantum field models of confinement and hadronization, physics of light and heavy quarks,* RFBR 01-02-1720 (2001)
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3.8 Personnel

Laboratory Personnel as of 01.04.2003

Themes	Permanent			Contracts		
	D	C	0	D	C	0
1. Modern Mathematical Physics	7	5(1)	0	2	2	1
Personnel of the Directorate				2	8	3
Total for the Theme	12(1)			18		
	30(1)					
2. Fields and Particles	17(1)	10(1)	1	5(3)	0	0
Personnel of the Directorate				4(1)	17	5
Total for the Theme	28(2)			31(4)		
	59(6)					
3. Theory of Nuclei and Other Finite Systems	21(1)	11	0	0	0	0
Personnel of the Directorate				2	14	1
Total for the Theme	32(1)			17		
	49 (1)					
4. Theory of Condensed Matter	11	6	0	1(1)	3(1)	1
Personnel of the Directorate				3	11	2
Total for the Theme	17			21(2)		
	38(2)					
Total for the Research Personnel	49	29	1	22	52	15
	89(4)			87(6)		
	176(10)					
Administrative and Technical Services	14			0		
	14					
Total for the Laboratory	103(4)			87(6)		
	190(10)					

Comments: D – Doctor of Sciences, C – Candidate of Sciences, 0 – without degree.
In brackets: number of staff members with part-time employments.

Personnel of the Directorate

	2001	2002
Armenia	4	3
Belarus	2	-
Bulgaria	4	4
Czechia	-	1
Georgia	2	1
Germany	5	5
Kazakhstan	2	2
Moldova	3	3
Mongolia	2	2
Poland	2	2
Russia	36	39
Slovakia	2	3
Ukraine	1	1
Uzbekistan	2	1
Total	**67**	**67**

Comment: Also, three fellows worked at BLTP.

3.9 Finance

Financing of the BLTP Scientific Research in 2001 – 2002 ($ th.)

Field of Research	2001		2002	
Theme	Plan	Expenditures	**Plan**	
Theoretical physics	**1695.2**	**1101.4**	**1647.6**	**1499.5**
1028 – Fields and Particles	866.1	649.4	809.0	Expenditures 800.2
1029 – Nuclear Theory	517.5	290.7	506.8	395.2
1030 – Theory of Condensed Matter	311.6	161.3	331.8	304.1
Elementary particle physics (0907, 1025)	**86.6**	**10.9**	**84.2**	**15.6**
Relativistic nuclear physics (0941, 1011)	**1.0**	**.2**	**1.0**	**.6**
Low- and Intermidiate-energy physics (1040)	**2.8**	**1.9**	**2.8**	**2.7**
Total	**1785.6**	**1114.4**	**1735.6**	**1518.4**

Comment: BLTP participated in realizing a number of the themes of other fields of research. Each theme is coded according to the Topical Plan for the JINR Reserch and International Cooperation in 2002.