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2.1 Structure of Laboratory and Scientific Divisions

Directorate

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

SCIENTIFIC DIVISIONS

I. Fields and Particles

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

II. Modern Mathematical Physics

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

III. Nuclear Theory

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

IV. Theory of Condensed Matter

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

V. Dubna International Advanced School of Theoretical Physics (DIAS-TH)

Leaders: *A.T. Filippov, A.S. Sorin*

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, Nuclear Theory, Theory of Condensed Matter. The themes are divided into the projects. Below, information about each theme and project is presented.

I. 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

<i>A.B. Arbuzov</i>	<i>G.A. Kozlov</i>
<i>S.M. Bilenky</i>	<i>V.A. Naumov</i>
<i>A.V. Gladyshev</i>	<i>M.N. Tentyukov</i>
<i>A.V. Kotikov</i>	<i>M. Yurchishin</i>

2. QCD: Spin Effects and Sum Rules

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

Principal researchers

<i>A.P. Bakulev</i>	<i>S.V. Mikhailov</i>
<i>S.V. Goloskokov</i>	<i>A.V. Radyushkin</i>
<i>P.S. Isaev</i>	<i>O.V. Selyugin</i>
<i>G.P. Korchemskii</i>	<i>A.V. Sidorov</i>

3. Nonperturbative Methods in QFT

Spokesperson: *D.V. Shirkov*

Principal researchers

<i>V.K. Mitrjushkin</i>	<i>I.L. Solovtsev</i>
<i>A.V. Nesterenko</i>	

4. Symmetries and Gauge Theories

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

Principal researchers

<i>N.A. Chernikov</i>	<i>Yu.S. Surovtsev</i>
<i>G.S. Pogosyan</i>	<i>S.I. Vinitsky</i>

5. Quantum Field Models of Heavy Quarks

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

Principal researchers

<i>G.V. Efimov</i>	<i>V.I. Korobov</i>
<i>S.M. Eliseev</i>	<i>D. Minal</i>
<i>G. Ganbold</i>	

6. Low Energy Quark Models of Light Hadrons

Spokespersons: *D. Blaschke*¹⁾, *A.E. Dorokhov*, *M.K. Volkov*

Principal researchers

<i>I.V. Anikin</i>	<i>V.A. Meshcheryakov</i>
<i>I.O. Cherednikov</i>	<i>A.E. Radzhabov</i>
<i>S.B. Gerasimov</i>	<i>A.V. Vinnikov</i>
<i>N.I. Kochelev</i>	<i>V.L. Yudichev</i>

1) Rostock University, Rostock, Germany

II. Modern Mathematical Physics

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

1. Quantum Groups and Integrable Systems

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

Principal researchers

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

2. Supersymmetry

Spokesperson: *E.A. Ivanov*

Principal researchers

<i>S.O. Krivonos</i>	<i>A.O. Sutulin</i>
<i>A.V. Shcherbakov</i>	<i>B.M. Zupnik</i>

3. Quantum Gravity, Cosmology and Strings

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

Principal researchers

<i>B.M. Barbashov</i>	<i>A.B. Pestov</i>
<i>B. Dimitrov</i>	<i>I.G. Pirozhenko</i>
<i>D.V. Fursaev</i>	<i>A.D. Popov</i>
<i>V.V. Griбанov</i>	<i>E.A. Tagirov</i>
<i>T.A. Ivanova</i>	

III. Nuclear Theory

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

1. Theory of Nuclear Excitations

Spokespersons: *V.V. Voronov*, *A.I. Vdovin*

Principal researchers

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

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

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

Principal researchers

<i>G.G. Adamian</i>	<i>V.G. Kartavenko</i>
<i>N.V. Antonenko</i>	<i>A.K. Nasirov</i>
<i>M. Cerkaski</i>	<i>R.G. Nazmitdinov</i>
<i>S.I. Fedotov</i>	<i>Yu.V. Pal'chikov</i>
<i>F.A. Gareev</i>	<i>V.P. Permyakov</i>

3. Few-Body Physics

Spokespersons: *V.B. Belyaev, A.K. Motovilov, J. Revai¹⁾*

Principal researchers

<i>S.S. Kamalov</i>	<i>V.S. Melezhik</i>
<i>E.A. Kolganova</i>	<i>V.V. Pupyshev</i>
<i>A.V. Matveenko</i>	

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

4. Relativistic Nuclear Dynamics

Spokespersons: *V.V. Burov, S.N. Ershov, V.K. Lukyanov*

Principal researchers

<i>S.G. Bondarenko</i>	<i>V.D. Toneev</i>
<i>L.P. Kaptari</i>	<i>S.S. Semikh</i>
<i>A.I. Titov</i>	<i>B.N. Zakhariev</i>

IV. Theory of Condensed Matter

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

1. Strongly Correlated Systems

Spokespersons: *N.M. Plakida, G. Röpke¹⁾*

Principal researchers

<i>W. Kleinig</i>	<i>N.B. Perkins</i>
<i>A.L. Kuzemsky</i>	<i>J. Schmelzer</i>
<i>V.A. Moskalenko</i>	<i>V.S. Shakhmatov</i>
<i>V.S. Oudovenko</i>	<i>V.Yu. Yushankhai</i>

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

2. Dynamic Systems: chaos, integrability, and self-organization

Spokesperson: *V.B. Priezzhev*

Principal researchers

<i>L. Alexandrov</i>	<i>A.M. Povolotsky</i>
<i>V.I. Inozemtsev</i>	<i>V.N. Plechko</i>
<i>K.V. Rerikh</i>	<i>P.E. Zhidkov</i>

3. Disordered Structures: glasses, topological defects, nanostructures, and Josephson junction

Spokesperson: *V.A. Osipov*

Principal researchers

<i>E.A. Kochetov</i>	<i>S.A. Sergeenkov</i>
<i>S.E. Krasavin</i>	

4. Mesoscopic and Coherent Phenomena in Quantum Systems

Spokespersons: *M.A. Smondyrev, V.I. Yukalov*

Principal researchers

E.N. Bukina

V.M. Dubovik

A.Yu. Cherny

A.A. Shanenko

A.V. Chizhov

2.2 Seminars

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

- NUCLEAR THEORY – Monday
(heads: *V.V. Voronov, R.V. Jolos*)
- MODERN MATHEMATICAL PHYSICS – Tuesday
(heads: *A.T. Filippov, A.P. Isaev*)
- STATISTICAL MECHANICS – Tuesday
(heads: *N.M. Plakida and V.B. Priezhev*)
- 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*)

2.3 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 2003–2004, collaboration with the INFN sections (Italy), IN2P3 Institutes (France), CERN TH, and ICTP. was continued. In 2003–2004, the collaboration with Polish theorists was based on the Bogoliubov–Infeld Programme, with Czech theorists, on the Blokhintsev–Votruba Programme, and Roumanian theorists on the Titeica–Markov

Number of Visits to BLTP

From	2003		2004	
	< 3 months	3–6 months	< 3 months	3–6 months
Member States	42	19	51	19
Other Countries	60		58	
Total	121		128	

Comment: without visits from Russia and conferences not included

Number of Visits of BLTP researchers

to	2003	2004
Member States	99(57)	101(62)
Other Countries	242(46)	264(46)
Total	341(103)	365(108)

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	
2003	106 T€	8	37	63	103	113
2004	105 T€	6	31	56	109	80

Comment: funds allocated by Germany in the framework of the agreement between JINR and BMBF for investigations on theoretical physics amounted to 125 T€ for 2003 including 19 T€ for equipment and for 2004 were 120 T€, including 15 T€ for equipment.

2.4 Presentation of Theses

Doctor of Physics and Mathematics

1. V.A. Kuz'min (BLTP) – June 10, 2003
“The structure of spherical nuclei and charge-exchange processes at low and intermediate energies”.
2. A.S. Sorin (BLTP) – June 10, 2003
“The linearization of W-algebras and integrable discrete and continuous hierarchies with the extended supersymmetry”.
3. D.V. Fursaev (BLTP) – June 10, 2003
“Finite-temperature quantum field theory in gravity and the problem of black hole entropy”.
4. G.S. Pogosyan (BLTP) – June 11, 2003
“Superintegrable systems in spaces of constant curvature”.
5. O.V. Teryaev (BLTP) – June 11, 2003
“Gluon structure of nucleon and spin asymmetries”.
6. N.I. Kochelev (BLTP) – June 11, 2003
“QCD vacuum and the spin-flavor properties of hadrons”.

Candidate of Physics and Mathematics

2003

1. D.B. Baranov (BLTP) – March 12
“Atomic traps in the gravitational field”.
Supervisor: V.S. Yarunin.

2. D.V. Proskurin (BLTP) – March 19
 “*Linearization of Hamiltonian constraints and its implementation in the construction of the conformal-invariant cosmological models*”.
Supervisors: B.M. Barbashov, V.N. Pervushin.
3. O.O. Voskresenskaya (LIT JINR) – June 4
 “*Some problems of the theory of production of hadronic atoms and their interaction with matter*”.
Supervisors: A.V. Tarasov (LNP JINR), E.A. Kuraev
4. T.M. Shneidman (BLTP)) – June 4
 “*Model of dinuclear system for investigation of nuclear structure and fission*”.
Supervisors: S.P. Ivanova (UC JINR), N.V. Antonenko
5. V.V. Serov (Saratov Univ.) – June 17
 “*Evaluating the nonlinear modes and wave packet dynamics in the laser-optical and atomic systems in the framework of the multidimensional Shroedinger equations*”,
 was defended at Saratov State University.
Supervisors: V.L. Derbov, S.I. Vinitsky.
6. V.A. Dolgushev (UC JINR) – December 24
 “*Classical and quantum reduction as applied to integrable systems and quantum algebras*”.
Supervisors: A.P. Isaev, S.L. Lyakhovich (Tomsk Univ.)
7. D. Behnke (Univ. Rostock) – December 25
 “*Conformal Cosmology*”,
 was defended at Rostock University.
Supervisors: D.B. Blashke, V.N. Pervushin.

2004

1. A.E. Radzhabov (BLTP) – September 15
 “*Light mesons in nonlocal quark model with confinement*”.
Supervisors: M.K. Volkov, A.E. Dorokhov.
2. A.A. Gusev (Belgorod Univ.) – September 17
 “*Complex algorithms for analysis of quantum systems in external fields*”,
 was defended at Belgorod State University.
Supervisors: S.I. Vinitsky, V.N. Samoilov (CAR, JINR)
3. A.G. Zorin (BLTP) – December 22
 “*Influence of the universe evolution on the dynamics of particles in the central field*”,
 was defended at Moscow State University.
Supervisors: D.V. Gal'tsov (MSU), V.N. Pervushin.

2.5 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 2003–2004 10 candidate theses were defended under the supervision of BLTP theorists (see the list of candidate dissertations on pages 186, 187).

The Laboratory actively participated in the organization of Chairs of Physics at the International University “Dubna”. In the summer of 2003 the Chairs of Theoretical and Nuclear Physics were established. They are headed by JINR Vice-Director, BLTP Director

Professor A.N. Sissakian and Scientific Leader of the Flerov Laboratory of Nuclear Reactions Academician of RAS Yu.Ts. Oganessian. Owing to the interaction with JINR the Chairs can form their curriculum taking into consideration the requirements put forward by the scientific community to a specialist in physics. As a result, students get modern education; whereas JINR, a possibility to attract talented students to research.

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*”, Physics Department of 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.
4. O.V. Teryaev “*Introduction to QCD*”, MSU, Dubna branch.
5. V.V. Voronov “*Nuclear Physics*”, Tver State University, from 2004 up to now.
8. S.I. Vinitzky – “*Computational methods of quantum mechanics*”, Tver State University, from 1997 up to now.
9. G.V. Efimov – “*Quantum Field Theory and Particle Physics*”, “*Functional integrals and their applications in physics*”, “*Introduction to Astrophysics*” Ivanovo State University, from 1997 up to now.
11. V.K. Mitrjushkin – “*Quantum Filed Theory on the Lattice*”, MSU, from 1999 up to now.
12. V.N. Pervushin – “*Hamiltonian Cosmology*”, JINR UNC, 2002 – 2003.
13. B.M. Barbashov – “*Introduction to the Speciality*”, International University “Dubna”.
14. V.S. Melezhik – “*General Physics*”, International University “Dubna”.
15. S.N. Nedelko – “*The theory of functions of a complex variable*”, International University “Dubna”.
16. I.G. Pirozhenko – “*Theoretical Mechanics*”, International University “Dubna”.
17. A.A. Vladimirov – “*Introduction to theoretical and mathematical physics*”, International University “Dubna”.
18. V.A. Osipov – “*Biophysics*”, International University “Dubna”, from 2001 up to now.
19. A.V. Chizhov – “*Quantum Mechanics*”; “*Introduction to the theory of radiation transport*”, International University “Dubna”.
20. S.E. Krasavin – “*Statistical Physics*”; “*Solid State Physics*”, International University “Dubna”.
21. D.I. Kazakov – a course of lectures “*Beyond the Standard Model*” at the European School of High-Energy Physics, Sant Felui de Guixols, Spain, 31.05 – 12.06.2004.
22. D.V. Fursaev, O.V. Teryaev – Discussion leaders at the European School of High-Energy Physics, Tsakhadzor, Armenia, 25.08 – 6.09.2003.

Another important aspect of the teaching activity is organization of schools for young scientists (see the list on pages 189, 190).

2.6 Dubna International Advanced School of Theoretical Physics (DIAS-TH)

The Bogoliubov Laboratory of Theoretical Physics has a good record of organizing international workshops and schools in Dubna. DIAS-TH organizes and supervises all educational programs for students, postgraduates, and young scientists at BLTP. It should function continuously and the standard short schools (about 3-4 a year) should be organized coherently. Other educational programs in Dubna such as the JINR University Center may also correlate with DIAS-TH (common programs on modern theoretical physics, workshops for students and young scientists, etc.).

The main topics of the DIAS activity centered around the most important directions of research at BLTP: Particles and Fields; Nuclear Theory; Theory of Condensed Matter; Modern Mathematical Physics.

In 2003 – 2004 the following activities in the framework of DIAS-TH were:

- Winter School on Theoretical Physics (January 27 – February 9, 2003); *supported by JINR.*
- VII-th Research Workshop on Nucleation Theory and Applications (April, 4 –28, 2003); *supported by JINR, DAAD, the Heisenberg-Landau Programme (HLP), and UNESCO (ROSTE).*
- International Workshop and School on Calculations for Modern and Future Colliders (June 13 – 22, 2003); *supported by JINR, the German Federal Ministry of Education and Research (BMBF) and HLP.*
- Advanced Summer School on Modern Mathematical Physics (July 11 – 22, 2003); *supported by JINR, RFBR, BMBF, HLP, the Blokhintsev-Votruba and Bogoliubov-Infeld Programmes.*
- DAAD Summer School on Traffic and Econophysics, (July 28 – August 17, 2003); *Supported by JINR and DAAD.*
- Vth International Physical Competition for Schoolchildren (December 19 – 22, 2004), *jointly organized with ITEP and Moscow Center for Continuous Mathematical Education.*
- 2nd Winter School on Theoretical Physics (January 30 – February 7, 2004); *supported by RFBR, JINR.*
- Advanced Summer School on Modern Mathematical Physics (July 4 –18, 2004), *jointly organized with ITEP; supported by JINR, RFBR, HLP, Grant of the Plenipotentiary of Ukraine.*
- International Summer School on Hot Points in Astrophysics and Cosmology (August 2 – 13, 2004); *supported by JINR, RFBR, HLP, Helmholtz Association.*
- International School on Selected Topics in Nuclear Theory (July 20 –29, 2004), *jointly organized with the JINR University Center; supported by JINR, RFBR, HLP and the Votruba-Blokhintsev Programme.*
- VIIIth Research Workshop on Nucleation Theory and Applications (October 1 – 31, 2004); *supported by JINR, RFBR, HLP, UNESCO (ROSTE).*
- VIth International Physical Competition for Schoolchildren (December 19 – 22, 2004), *jointly organized with ITEP and Moscow Center for Continuous Mathematical Education.*

- Lecture course on Quantum Chromodynamics was given at the Laboratory of Particle Physics.
- Lecture course on Contemporary Problems in Quantum Field Theory of Dense Nuclear/Quark Matter was given at the JINR University Center.
- Computer processing of video records of lectures was organized.
- Web-site of DIAS-TH was created.

Preliminary Plan for 2005

- 3rd Winter School on Theoretical Physics
(January 29 – February 6)
- International School on Heavy Quark Physics
(June 6 – 16)
- IX-th Research Workshop on Nucleation Theory and Applications
(June 20 – July 20)
- Advanced Summer School on Modern Mathematical Physics
(July 14 – 26)
- International School on Nuclear Theory and Astrophysical Applications
(July 26 – August 4)

2.7 Conferences and Meetings

2003

1. XII-th International Conference "Selected Problems of Modern Physics", dedicated to the 95th anniversary of the birth of D.I. Blokhintsev (1908 – 1979), *(June 8 – 11, Dubna). Supported by the Heisenberg – Landau Programme (HLP), the Bogoliubov-Infeld (BIP), Votruba-Blokhintsev(VBP) Programmes, Russian Foundation for Basic Research (RFBR), the Ministry of Industry, Science and Technology, the Ministry of Atomic Energy of the Russian Federation*
2. XII-th International Colloquium "Quantum Groups and Integrable Systems", *(June 12 – 14, Prague, Czech Republic), jointly organized by the BLTP, Czech Technical University, Charles University. Supported by VBP.*
3. Advanced Study Institute "Symmetries and Spin", *(July 12 – 19, Prague, Czech Republic).*
4. International Workshop "Supersymmetries and Quantum Symmetries", *(July 24 – 29, Dubna). Supported by HLP, BIP, VBP.*
5. X-th International Conference "Symmetry Methods in Physics", *(August 13 – 19, Yerevan, Armenia). Supported by BIP, VBP and RFBR.*
6. International Conference "Nuclear Structure and Related Topics", *(September 2 – 6, Dubna). Supported by HLP*
7. X-th Advanced Research Workshop on High Energy Spin Physics, (NATO ARW Dubna-Spin-03), *(September 16–20, Dubna). Supported by JINR, International Committee on Spin Physics, RFBR, and NATO Science Program.*

2004

1. International Workshop "Classical and Quantum Integrable Systems", *(January 26 – 29, Dubna), jointly organized by the BLTP, MI RAS and IHEP. Supported by HLP and RFBR.*

2. XIII International Colloquium "Quantum Groups and Integrable Systems",
(June 17 – 19, Prague, Czechia), jointly organized by the BLTP, Czech Technical University, Charles University. Supported by the Blokhintsev-Votruba Programme.
3. XI-th International Conference "Symmetries Methods in Physics",
(June 21 – 24, Prague, Czechia), jointly organized by the BLTP, Czech Technical University. Supported by the Blokhintsev-Votruba Programme.
4. Advanced Study Institute "Symmetries and Spin",
(July 5 – 10, Prague, Czech Republic).
5. The Bogoliubov Conference "Problems of Theoretical and Mathematical Physics",
dedicated to the 95th anniversary of the birth of N.N. Bogoliubov (1909 – 1992),
(September 2 – 6, Dubna), jointly organized by JINR and RAS. Supported by JINR, UNESCO-ROSTE, and RFBR.
6. XVII International Seminar on High Energy Physics Problems,
(September 27 – October 1, Dubna), jointly organized by LHE and BLTP.
Supported by JINR, Ministry of Science and Technology of the Russia and RFBR.

Comment: see also part 2.6

2.8 Grants

Russian Programme of supporting leading scientific schools

- D.V. Shirkov, A.V. Bednyakov, D.I. Kazakov, A.V. Gladyshev, I.L. Solovtsov, A.A. Sheplyakov, 2339.2003.2, (2003 – 05).
- V.G. Kadyshevsky, participants from BLTP: A.B. Arbuzov, V.V. Bytiev, D.V. Fursaev, 2027.2003.2, (2003 – 05).

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.B. Arbuzov, M.Yu. Kalmykov, E.S. Scherbakova – *Evaluation of two-loop radiative corrections for processes $1 \rightarrow 2$, and $2 \rightarrow 2$* , RFBR 04-02-17192, (2004– 06).
3. 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 03-02-16816, (2003 – 04).
4. 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).
5. V.V. Nesterenko, I.G. Pirozhenko, *Spectral Geometry in Quantum Field Theory and in Quantum Gravity*, RFBR 03-01-00025, (2003 – 04).
6. A.T. Filippov, A.P. Isaev, P.N. Pyatov, A.S. Sorin, V.P. Spiridonov, N.A. Tyurin, *Quantum symmetries of the integrable models of field theory, statistical physics and gravity*, RFBR 03-01-00781, (2003 – 04).

7. E. Ivanov, S. Krivonos, B. Zupnik, A. Pashnev, A. Sutulin, *Superbranes, higher spins and superconformal symmetries*, RFBR-03-02-17440 (2003 – 04).
8. G.V. Efimov, M. Ivanov, S. Nedelko, *Quantum field models of confinement and hadronization, physics of light and heavy quarks*, RFBR 04-02-17370 (2004)
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2.9 Computer Facilities

The transition to new high-performance cabling system UTP was completed in BLTP's local network in 2003. Almost all PC in BLTP are now connected to the Fast Ethernet network. The Gigabit Ethernet connects servers and provides access to the JINR's backbone network. The new main Laboratory's server theor.jinr.ru was started up. User home directories as well as e-mail, WWW-server and other services were moved to the new server from thsun1.jinr.ru. The WWW access to e-mail was arranged – <http://theor.jinr.ru/mail/>. The hardware on servers thproxy.jinr.ru and unamp.jinr.ru was upgraded. RFBR has funded the purchase of two dual-processor servers based on 64-bit AMD Opteron processors. 35 personal computers based on Pentium 4 were acquired for work places upgrade. The color laser printer HP Color LaserJet 2550 was purchased. New WWW resource was created: <http://thproxy.jinr.ru/diastp/>. Video records and slides of lectures given by the well-known scientists at Dubna International Advanced School of Theoretical Physics are presented to visitor's attention.

2.10 Personnel

Laboratory Personnel as of 01.04.2005

Themes	Permanent			Contracts		
	D	C	0	D	C	0
1. Fields and Particles	11(1)	6(1)	1	15(6)	4	
Personnel of the Directorate				6(3)	14	7
Total for the Theme	18(2)			46(9)		
	64(11)					
2. Modern Mathematical Physics	6	3(1)	0	4(1)	4	1
Personnel of the Directorate				1	6	2
Total for the Theme	9(1)			18(1)		
	27(2)					
3. Nuclear Theory	14(1)	7	0	8	5	0
Personnel of the Directorate				2(1)	9	9
Total for the Theme	21(1)			33(1)		
	54 (2)					
4. Theory of Condensed Matter	9	5	0	1	4	1
Personnel of the Directorate				3	8	3
Total for the Theme	14			20		
	34					
5. DIAS-TH				7(7)	5(5)	1
Total for the Theme	13(12)					
	including 11 staff members of other themes					
Total for the Research Personnel	40	21	1	41	54	24
	62(4)			119(12)		
	181(16)					
Administrative and Technical Services	10			3		
	13					
Total for the Laboratory	72(4)			122(12)		
	194(16)					

Comments: D – Doctor of Sciences, C – Candidate of Sciences, 0 – without degree.

In brackets: number of staff members with part-time employments

Also 21 students, post-graduate students, and 7 fellows worked at BLTP

Personnel of the Directorate

	2003	2004
Armenia	4	3
Belarus	1	1
Bulgaria	4	5
Czechia	1	1
Georgia	1	1
Germany	5	5
Kazakhstan	1	2
Moldova	3	3
Mongolia	2	2
Poland	1	1
Russia	39	41
Slovakia	2	3
Ukraine	1	1
Uzbekistan	1	1
Total	66	70

Comment: Also, seven fellows worked at BLTP.

2.11 Finance

Financing of the BLTP Scientific Research in 2003 – 2004 (\$ th.)

Field of Research	2003		2004	
	Plan	Expenditures	Plan	Expenditures
Theoretical physics	1643.7	1618.8	1651.9	2303.5
1028 – Fields and Particles	597.4	680.4	590.9	893.1
1029 – Nuclear Theory	482.9	416.8	464.8	611.7
1030 – Theory of Condensed Matter	313.2	301.3	312.1	423.4
1047 – Modern Mathematical Physics	250.2	220.3	225.1	306.7
1053 – DIAS-TH			59.0	68.6
Elementary particle physics (0907, 1025)	79.0	53.5	84.4	48.5
Relativistic nuclear physics (0941, 1011)	1.0	.9	1.0	1.3
Total	1723.7	1673.2	1737.3	2353.3

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 Research and International Cooperation in 2005.