

Few-Body Systems Group (Sector 11) at BLTP, JINR

2003 Annual Activity Report

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1 Staff of the BLTP Sector 11 in 2003

(Status of December 2003)

1. [V.B. Belyaev](#), Prof., Dr. Sc., Principal Researcher
 2. [G.S. Bisnovaty-Kogan](#), Prof., Dr. Sc., Principal Researcher (part-time)
 3. [S.S. Kamalov](#), Dr., Senior Researcher
 4. [E.A. Kolganova](#), Dr., Senior Researcher
 5. [M.Kh. Khankhasaev](#), Dr. Sc., Leading Researcher
 6. [A.V. Matveenko](#), Dr. Sc., Leading Researcher
 7. [V.S. Melezhik](#), Dr. Sc., Leading Researcher
 8. [A.K. Motovilov](#), Dr., Head of the Group
 9. [F.M. Pen'kov](#), Dr. Sc., Leading Researcher
 10. [V.V. Pupyshev](#), Dr., Senior Researcher
 11. [N.V. Shevchenko](#), Dr., Senior Researcher
- [A.F. Os'kin](#) (M. Sc., Ph. D. Student)

2 Publications

2.1 Books

1. Eds. A.K. Motovilov and F.M. Pen'kov, "Selected topics in theoretical physics and astrophysics. Collection of papers dedicated to Vladimir B. Belyaev on occasion of his 70th birthday", *JINR, Dubna, 2003. D4-2003-89. 168 p.*
2. Eds. A. Sissakian, G. Kozlov, and E. Kolganova, Proceedings of the XXXII International Symposium on Multiparticle Dynamics (Alushta, Ukraine, 7 – 13 September, 2002), *World Scientific, Singapore, 2003. 433 p.*

2.2 Journal publications

1. S. Albeverio, K.A. Makarov, and A.K. Motovilov, "Graph subspaces and the spectral shift function", *Canadian Journal of Mathematics* **55**:3, 449–503 (2003).
2. D. Baye, P. Capel, and V.S. Melezhik, "Time-dependent analysis of the Coulomb breakup of weakly-bound nuclei", *Nucl. Phys. A* **722**, 328c–334c (2003).
3. G.S. Bisnovatyi-Kogan, "Magnetorotational mechanism: supernovae explosions and jet formation", *Annals Europ. Acad. Sci.* (2003), 247–276.
4. G.S. Bisnovatyi-Kogan, "Possible mechanism of electric field origin around celestial bodies", *Month. Not. R.A.S.* **343**, 771–774 (2003).
5. V.M. Bystritsky and F.M. Pen'kov, "Analytic estimates of the product yields for nuclear reactions in the ultralow energy range", *Phys. Atom. Nucl.* **66**, 75–80 (2003).
6. P. Capel, D. Baye and V.S. Melezhik, "Supersymmetric elimination of forbidden states in the Coulomb breakup of the ^{11}Be halo nucleus", *Phys. Lett. B* **552** 145–148 (2003).
7. P. Capel, D. Baye and V.S. Melezhik, "Time-dependent analysis of the breakup of halo nuclei", *Phys. Rev. C* **68** 014612, 1–13 (2003).
8. G.Y. Chen, S.S. Kamalov, S.N. Yang, D. Drechsel, and L. Tiator, "Excitation of S(11) resonances in pion scattering and pion photoproduction on the proton," *Nucl. Phys. A* **723** 447–463 (2003).
9. V. Hardt, R. Mennicken, and A.K. Motovilov, "Factorization theorem for the transfer function associated with an unbounded non-self-adjoint 2×2 operator matrix", *Operator Theory: Advances and Applications* **142**, 117–132 (2003).
10. E.A. Kolganova, Y.K. Ho, A.K. Motovilov, and W. Sandhas, "The $^3\text{He}^4\text{He}_2$ trimer within the hard-core Faddeev approach", *Czech. J. Phys.* **53**, B301–B304 (2003).
11. V. Kostykin, K.A. Makarov, and A.K. Motovilov, "Existence and uniqueness of solutions to the operator Riccati equation. A geometric approach", *Contemporary Mathematics* **327**, 181–198 (2003).

12. V. Kostykin, K.A. Makarov, and A.K. Motovilov, "On a subspace perturbation problem", *Proceedings of the American Mathematical Society* **131**, 3469–3476 (2003).
13. I.A. Kryukov, N.V. Pogorelov, U. Anzer, G.S. Bisnovatyi-Kogan, and G. Börner, "The influence of radiative effects on the accretion onto stellar magnetospheres", *Astron. Astrophys.* **402**, 13–28 (2003).
14. A.V. Matveenko and E.O. Alt, "Rotational states of the Helium trimer in the symmetry-adapted hyperradial-adiabatic approach", *Few-Body Systems Suppl.* **14**, 207–210 (2003).
15. V.S. Melezhik and Chi-Yu Hu, "Ultracold atom-atom collisions in a nonresonant laser field", *Phys. Rev. Lett.* **90** 083202, 1–4 (2003).
16. S.G. Moiseenko, N.V. Ardeljan, and G.S. Bisnovatyi-Kogan, "Supernova type II: Magnetorotational explosion", *Revista Mexicana de Astronomi'a y Astrofi'sica (Ser. Conf.)* **15**, 231-233 (2003).
17. E. Oset, D. Jido, J. Palomar, A. Ramos, C. Bennhold, and S. Kamalov, "Chiral dynamics in systems with strangeness", *Few-Body Syst. Suppl.* **14**, 263–268 (2003).
18. F.M. Pen'kov, "One-parametric dependencies of the spectra, scattering lengths, and recombination coefficients for a system of three bosons", *JETP* **97**, 485–492 (2003).
19. V.V. Pupyshev, "An example of three-body collapse", *J. Phys. A: Math. Gen.* **36**, L13 – L20 (2003).
20. V.V. Pupyshev, "Exact solution of the three-body problem with S-wave interaction of centrifugal type", *Phys. Atom. Nucl.* **62**, 1814 – 1823 (2003).
21. V.V. Pupyshev, "Structure of the regular solutions of the three-body Schrödinger equation near the pair impact point", *Theor. Math. Phys.* **136**, 970 – 993 (2003).
22. V.V. Pupyshev, "Extrapolation of triplet phase shifts of proton-proton scattering to low energies", *JETP* **97**, 1093 – 1101 (2003).
23. J. Revai and V.B. Belyaev, "Search for long-lived states in antiprotonic Lithium", *Phys. Rev. A* **67** 032507 (2003).
24. N.V. Shevchenko, V.B. Belyaev, S.A. Rakityansky, S.A. Sofianos, and W. Sandhas, "Coherent photoproduction of η mesons on three-nucleon systems", *Nucl. Phys. A* **714** 277–290 (2003).
25. L. Tiator, D. Drechsel, S.S. Kamalov, and S.N. Yang, "Electromagnetic form-factors of the Δ (1232) excitation", *Eur. Phys. J. A* **17**, 357–363 (2003).
26. S.N. Yang, G.Y. Chen, S.S. Kamalov, D. Drechsel, and L. Tiator, "Third and fourth S(11) resonances in pion scattering and pion photoproduction", *Nucl. Phys. A* **721**, 401–404 (2003).
27. S.N. Yang and S.S. Kamalov, "Probing Delta structure with pion electromagnetic production", *Mod. Phys. Lett. A* **18**, 248–257 (2003).

2.3 Articles in paper collections

1. G.S. Bisnovatyi-Kogan, “Stellar oscillations and convection in the presence of URCA shell”, *Selected topics in theoretical physics and astrophysics. Collection of papers dedicated to Vladimir B. Belyaev on occasion of his 70th birthday, Dubna: JINR, 2003. P. 83–98.*
2. E.A. Kolganova, Y.K. Ho, A.K. Motovilov, and W. Sandhas, “The ${}^3\text{He}{}^4\text{He}_2$ three-atomic system within the hard-core Faddeev approach”, *Selected topics in theoretical physics and astrophysics. Collection of papers dedicated to Vladimir B. Belyaev on occasion of his 70th birthday, Dubna: JINR, 2003. P. 129–135.*
3. F.M. Pen’kov, “Pre-threshold three-body resonances as highly excited states of negative molecular ions”, *Selected topics in theoretical physics and astrophysics. Collection of papers dedicated to Vladimir B. Belyaev on occasion of his 70th birthday, Dubna: JINR, 2003. P. 42–56.*
4. V.V. Pupyshev, “Low-energy behavior of triplet pp scattering phase shifts”, *Selected topics in theoretical physics and astrophysics. Collection of papers dedicated to Vladimir B. Belyaev on occasion of his 70th birthday, Dubna: JINR, 2003. P. 57–65.*

2.4 Articles accepted for publication

1. A.N. Baushev and G.S. Bisnovatyi-Kogan, “Light curve and neutrino spectrum radiated during a collapse of supermassive nonrotating star”, *Astron. Zh.* (to appear).
2. G.S. Bisnovatyi-Kogan, “A simplified model of the formation of structures in the dark matter, and a background of very long gravitational waves”, *Month. Not. R. A. S.* (to appear).
3. C. W. Kao, D. Drechsel, S. Kamalov, and M. Vanderhaeghen, “Higher moments of nucleon spin structure functions in heavy baryon chiral perturbation theory and in a resonance model,” *Phys. Rev. C* (to appear).
4. V. Kostykin, K.A. Makarov, and A.K. Motovilov, “A generalization of the $\tan 2\Theta$ Theorem”, *Operator Theory: Advances and Applications* (to appear).
5. V. Kostykin, K.A. Makarov, and A.K. Motovilov, “On the existence of solutions to the operator Riccati equation and the $\tan \Theta$ theorem”, *Integral Equations and Operator Theory* (to appear).
6. V.S. Melezhik, J.S. Cohen, and Chi-Yu Hu, “Stripping and excitation in collisions between p and $\text{He}^+(n \leq 3)$ calculated by a quantum time-dependent approach with semiclassical trajectories”, *Phys. Rev. A* (to appear).
7. A.K. Motovilov and V.B. Belyaev, “Perturbation of finite-lattice spectral levels by nearby nuclear resonances”, *Particles and Nuclei, Letters* **1 [118]**, 15–24 (2004).
8. V.V. Pupyshev, “Spline-function method in the three-body problem”, *Particles and Nuclei* (to appear).

9. W. Sandhas, E.A. Kolganova, Y.K. Ho, A.K. Motovilov, “Binding energies and scattering observables in the ${}^4\text{He}_3$ and ${}^3\text{He}^4\text{He}_2$ three-atomic systems”, *Few-Body Systems Suppl.* (to appear).
10. W. Sandhas, E.A. Kolganova, A.K. Motovilov, and Y.K. Ho, “Binding energies and scattering observables in the ${}^3\text{He}^4\text{He}_2$ atomic system”, *Nucl. Phys. A* (to appear).

2.5 Preprints and data bases

1. V.B. Belyaev, B.F. Kostenko, M.B. Miller, A.V. Sermyagin, and A.S. Topolnikov, “Super-high temperatures and acoustic cavitation”, *JINR Short Communications P3-2003-214*, JINR, Dubna, 2003.
2. V.B. Belyaev, S.B. Levin, S.L. Yakovlev, “Three charged particles in continuum. Astrophysical examples,” [arXiv:physics/0310105](https://arxiv.org/abs/physics/0310105).
3. V. Kostrykin, K.A. Makarov, and A.K. Motovilov, “Perturbation of spectra and spectral subspaces”, [arXiv:math.SP/0306025](https://arxiv.org/abs/math.SP/0306025).
4. G. Laveissiere, . . . , S.S. Kamalov, . . . [JLab Hall A Collaboration], “Backward electroproduction of π^0 mesons on protons in the region of nucleon resonances at four momentum transfer squared $Q^2 = 1.0 \text{ GeV}^2$ ”, [arXiv:nucl-ex/0308009](https://arxiv.org/abs/nucl-ex/0308009).
5. J. Revai and N.V. Shevchenko, “Primary population of antiprotonic helium states”, [arXiv:physics/0310153](https://arxiv.org/abs/physics/0310153).
6. L. Tiator, D. Drechsel, S. Kamalov, M. M. Giannini, E. Santopinto, and A. Vassallo, “Electroproduction of nucleon resonances”, [arXiv:nucl-th/0310041](https://arxiv.org/abs/nucl-th/0310041).

2.6 Conference contributions

1. D. Baye, P. Capel, and V.S. Melezhik, “Time-dependent analysis of the breakup of halo nuclei”, International Symposium HALO 03, St. Petersburg, Russia, 25 – 27 June 2003.
2. D. Baye, P. Capel, and V.S. Melezhik, “Time-dependent calculations of the breakup of two-cluster nuclei”, 8th International Conference on Clustering Aspects of Nuclear Structure and Dynamics, Nara, Japan, 24 – 29 November 2003.
3. V.B. Belyaev, N.V. Shevchenko, and W. Sandhas, “Binding Charmonium with Few-Nucleons”, The 17th International IUPAP Conference on Few-Body Problems in Physics, June 5 – 10, 2003, Durham, North Carolina, USA.
4. V.B. Belyaev, S.B. Levin, and S.L. Yakovlev, “Coulomb-Fourier Transformation Approach in Two-Center Problem”, The 17th International IUPAP Conference on Few-Body Problems in Physics, June 5 – 10, 2003, Durham, North Carolina, USA.
5. V.B. Belyaev, A.K. Motovilov, M.B. Miller, I.V. Kuznetsov, A.V. Sermyagin, Yu.G. Sobolev, A.A. Smolnikov, A.A. Klimenko, S.I. Vasiliev, and V. Ugryumov, “Search for Spontaneous Molecular-Nuclear Transitions ${}^6\text{LiD} \rightarrow {}^8\text{Be}$ ”, The 17th International IUPAP

- Conference on Few-Body Problems in Physics, June 5 – 10, 2003, Durham, North Carolina, USA.
6. G.S. Bisnovaty-Kogan, “Physical limits to gamma-ray bursts mechanism”, The International Conference “I.Ya. Pomeranchuk and physics at the turn of centuries”, January 24 – 28, 2003, Moscow.
 7. G.S. Bisnovaty-Kogan, “Physical Restrictions to Cosmological Gamma-Ray Burst Models”, IAU Colloquium 192 on Supernovae (10 years of SN1993), April 22 – 26, 2003, Valencia, Spain.
 8. G.S. Bisnovaty-Kogan, “Physical Limits of Different Models of Cosmic Gamma-Ray Bursts”, Frascati Workshop 2003 on Multifrequency Behaviour of High Energy Cosmic Sources, May 26 – 31, 2003, Vulcano, Italy.
 9. G.S. Bisnovaty-Kogan, “Dynamic stability of compact stars”, NATO ARW “Superdense QCD matter and compact stars”, September 27 – October 4, 2003, Jerewan, Armenia.
 10. M.Khankhasayev and S. Miller, “Review of Recommendations from the Almaty Working Group Meeting on Landscape Sciences (22-24 September 2003): Landscape Science and Public Health Issues for Environmental Decision-Making in Central Asia”. NATO/CCMS Pilot Study on Environmental Decision-Making for Sustainable Development in Central Asia, 17 March 2003, Brussels, Belgium.
 11. E.A. Kolganova, Y.K. Ho, A.K. Motovilov, and W. Sandhas, “Binding Energy and Scattering Observables in the ${}^3\text{He}{}^4\text{He}_2$ Atomic System”, The 17th International IUPAP Conference on Few-Body Problems in Physics, June 5 – 10, 2003, Durham, North Carolina, USA.
 12. E.A. Kolganova, Y.K. Ho, A.K. Motovilov, and W. Sandhas, “The ${}^3\text{He}{}^4\text{He}_2$ three-atomic system within the hard-core Faddeev approach”, Workshop on computational physics dedicated to the memory of Stanislav Merkuriev, August 24 – 27, 2003, St.Petersburg, Russia.
 13. V. Kostrykin, K.A. Makarov, and A.K. Motovilov, “On perturbation of spectral subspaces”, International Workshop on Operator Theory and Applications (IWOTA 2003), Cagliari, Italy, June 24 – 27, 2003.
 14. V. Kostrykin, K.A. Makarov, and A.K. Motovilov, “On a subspace perturbation problem”, Workshop on computational physics dedicated to the memory of Stanislav Merkuriev, August 24 – 27, 2003, St. Petersburg, Russia.
 15. F.M. Pen’kov, “One-parameter dependences in a three-boson system”, Talk at the ‘Workshop on computational physics dedicated to the memory of Stanislav Merkuriev, August 24 – 27, 2003, St.Petersburg, Russia.
 16. V.V. Pupyshv, “An example of collapsing solutions to the Faddeev differential equations”, International Conference “Kolmogorov and Contemporary Mathematics”, June 16 – 21, 2003, Moscow, Russia.

17. V.V. Pupyshev, “Spline algorithms for solving the Faddeev differential equations in the bi-spherical basis”, Workshop on computational physics dedicated to the memory of Stanislav Merkuriev, August 24 – 27, 2003, St.Petersburg, Russia.
18. W. Sandhas, E.A. Kolganova, Y.K. Ho, and A.K. Motovilov, “Binding energies and scattering observables in the $^4\text{He}_3$ and $^3\text{He}^4\text{He}_2$ three-atomic systems”, Workshop on Critical Stability III: Dynamics and Structure of Critically Stable Quantum Few-Body Systems, August 31 – September 6, 2003, ECT*, Trento, Italy.

3 Visits

3.1 Conferences, schools

1. V.B. Belyaev, The 17th International IUPAP Conference on Few-Body Problems in Physics, June 5 – 10, 2003, Durham, North Carolina, USA.
2. V.B. Belyaev, Workshop on computational physics dedicated to the memory of Stanislav Merkuriev, 24 – 27 August 2003, St. Petersburg, Russia.
3. G.S. Bisnovaty-Kogan, IAU Colloquium 192 on Supernovae (10 years of SN1993), April 22 – 26, 2003, Valencia, Spain.
4. G.S. Bisnovaty-Kogan, Frascati Workshop 2003 on Multifrequency Behaviour of High Energy Cosmic Sources, May 26 – 31, 2003, Vulcano, Italy.
5. G.S. Bisnovaty-Kogan, NATO ARW “Superdense QCD matter and compact stars” September 26 – 29, 2003, Jerewan, Armenia.
6. S.S. Kamalov, 20th Students Workshop on Electromagnetic Interactions, August 31 – September 5, 2003, Bosen, Germany.
7. S.S. Kamalov, 4th International Workshop on Chiral Dynamics: Theory and Experiment, September 8 – 13, 2003, Bonn, Germany.
8. M.Kh. Khankhasayev, NATO/CCMS International Workshop “Landscape Science and Public Health Issues for Environmental Decision-Making in Central Asia”, 17 March 2003, Brussels, Belgium.
9. M.Kh. Khankhasayev, The 6th International Symposium and Exhibition on Environmental Contamination in Central and Eastern Europe, 1 – 4 September 2003, Prague, Czech Republic.
10. M.Kh. Khankhasayev, NATO/CCMS International Workshop “Water, Sanitation and Public Health Impacts in Rural Areas of Central Asia”, 4 – 5 November 2003, Almaty, Kazakhstan.
11. E.A. Kolganova, Advanced Study Institute “Physics at LHC”, 6 – 12 July 2003, Prague, Czech Republic.
12. E.A. Kolganova, Workshop on computational physics dedicated to the memory of Stanislav Merkuriev, 24 – 27 August 2003, St. Petersburg, Russia.

13. A.V. Matveenکو, XXIII International Conference on Photonic Electronic and Atomic Collisions, Stockholm, Sweden, July 23 – 29, 2003.
14. A.V. Matveenکو, Workshop on computational physics dedicated to the memory of Stanislav Merkuriev, 24 – 27 August 2003, St. Petersburg, Russia.
15. A.K. Motovilov, Workshop on computational physics dedicated to the memory of Stanislav Merkuriev, 24 August 2003, St. Petersburg, Russia.
16. F.M. Pen'kov, Workshop on computational physics dedicated to the memory of Stanislav Merkuriev, 24 – 27 August 2003, St. Petersburg, Russia.
17. V.V. Pupyshev, International Conference “Kolmogorov and Contemporary Mathematics”, June 16 – 21, 2003, Moscow, Russia.
18. V.V. Pupyshev, Workshop on computational physics dedicated to the memory of Stanislav Merkuriev, 24 – 27 August 2003, St. Petersburg, Russia.
19. N.V. Shevchenko, Workshop on computational physics dedicated to the memory of Stanislav Merkuriev, 24 – 27 August 2003, St. Petersburg, Russia.

3.2 Collaboration visits

1. V.B. Belyaev, Physics Institute, Bonn University, Bonn, Germany, 01.01.2003 – 24.01.2003.
2. V.B. Belyaev, Stockholm University, Stockholm, Sweden, 8.10.2003 – 23.10.2003.
3. V.B. Belyaev, Physics Institute, Bonn University, Bonn, Germany, 15.12.2003 – 31.12.2003.
4. G.S. Bisnovatyι-Kogan, Physics Department, Univ. La Sapienza, Rome, Italy, 01.10.2003 – 31.10.2003.
5. G.S. Bisnovatyι-Kogan, Theoretical Astrophysics Center, Copenhagen, Denmark, 08.11.2003 – 22.12.2003.
6. S.S. Kamalov, Taipei National University, Taipei, Taiwan, 20.01.2003 – 20.04.2003.
7. S.S. Kamalov, University of Mainz, Mainz, Germany, 21.08.2003 – 31.12.2003.
8. E.A. Kolganova, Institute of Atomic and Molecular Science, Academia Sinica, Taipei, Taiwan, 15.01.2003 – 30.04.2003
9. E.A. Kolganova, Physics Institute, Bonn University, Bonn, Germany, 27.10.2003 – 26.11.2003.
10. V.S. Melezhik, California State University at Long Beach, Long Beach, California, 01.01.2003 – 28.07.2003.
11. A. V. Matveenکو, University of Wroclaw, Poland, 16.11.2003 – 01.12.2003.
12. A. V. Matveenکو, University of Mainz, Germany, 01.12.2003 – 15.12.2003.

13. A.K. Motovilov, Institute for Applied Mathematics, Bonn University, Bonn, Germany, 02.06.2003 – 01.08.2003.
14. A.K. Motovilov, Physics Institute, Bonn University, Bonn, Germany, 15.10.2003 – 14.12.2003.
15. A.F. Os'kin, Theoretical Physics Department, KFKI, Budapest, Hungary, 01.11.2003 – 22.11.2003.
16. F.M. Pen'kov, Physics Institute, Bonn University, Bonn, Germany, 15.10.2003 – 14.12.2003.
17. N.V. Shevchenko, Theoretical Physics Department, KFKI, Budapest, Hungary, 01.05.2003 – 10.06.2003.

4 Visitors

1. H. Fukuda, University of Shizuoka, Japan, 17.08.2003–14.09.2003.
2. S. Oryu, University of Tokyo, Japan (a week in August 2003).
3. J. Revai, Theoretical Physics Department, KFKI, Budapest, Hungary, 10.08.2003 – 23.08.2003.

5 Grants

1. “Interaction of different mesons with three- and four-nucleon states”, DFG–RFBR 436 RUS 113/761, 2003–2005 (Principal Investigators: W. Sandhas, Institute for Physics, University of Bonn, Bonn, Germany, and V.B. Belyaev; participant from BLTP: N.V. Shevchenko).
2. “Scattering and recombination processes in three-atomic systems at ultra-low energies” DFG–RFBR 436 RUS 113/655 (02–02–04014), 2002–2004 (Principal Investigators: W. Sandhas, Institute for Physics, University of Bonn, Bonn, Germany, and A.K. Motovilov; participants from BLTP: E.A. Kolganova and F.M. Penkov).
3. “Multi-dimensional numerical simulations in astrophysics: investigation of novae, supernovae and accretion processes”, INTAS grant 00-491 (Principal Investigator: J. Isern, Institut d'Estudis Espacials de Catalunya (CSIC), Barcelona, Spain; G.S. Bisnovatyi-Kogan — Coordinator from IKI RAN).
4. “Resonant Molecular-Nuclear Fusion, Relevant Aspects of Single Bubble Sonoluminescence and New-Type Picosecond-Puls,” ISTC No. 1471 (Principal Investigator from JINR: V.B. Belyaev; participants from BLTP: A.K. Motovilov and F.M. Penkov)
5. “Investigation of dynamical processes in vicinity of relativistic objects: 2 and 3 - D numerical modeling”, RFBR 02–02–16900 (Principal Investigator: G.S. Bisnovatyi-Kogan).

6. “Dispersion relations analysis of pion photo- and electroproduction”, a Heisenberg-Landau grant (Researcher from BLTP: S.S. Kamalov).
7. “Scattering and recombination in three-atomic systems at ultra-low energies”, RFBR 01-02-17575, 2001–2003 (Principal Investigator: V.B.Belyaev; participants from BLTP: E.A. Kolganova, A.K. Motovilov, and F.M. Pen’kov).
8. “Operator Riccati equation and invariant subspaces of matrix Hamiltonians”, RFBR 01-01-00958, 2001-2003 (Principal Investigator: A. K. Motovilov)
9. “Scattering, resonances, and breakup in few-body quantum systems”, RFBR 01-02-16683, 2001-2003 (Principal investigator: S.L. Yakovlev, Department of Mathematical and Computational Physics, St. Petersburg State University, St. Petersburg, Russia; participants from BLTP: E.A. Kolganova and A.K. Motovilov)
10. “Charge particle formation at muon capture by helium isotope nuclei”, RFBR 01-02-16483, 2001–2003 (Principal Investigator: V.A. Stolupin, DLNP; participant from BLTP: F.M. Pen’kov).
11. “Measurement of the astrophysical S factors and cross sections for the pd and $d\ ^3He$ reactions at ultralow collision energies using inverse Z-pinch”, RFBR 03-02-17278, 2003–2005 (Principal Investigator: V.M. Bystritsky, DLNP; participant from BLTP: F.M. Pen’kov).

6 Teaching

1. V. B. Belyaev, Ph. D. Thesis adviser of A.F. Oskin, Ph. D. student at UNC, JINR, Dubna.
2. G.S. Bisnovatyi-Kogan, Ph. D. Thesis adviser of A.N. Baushev, Ph.D. student at MFTI, Moscow.
3. G.S. Bisnovatyi-Kogan, Ph. D. Thesis adviser of O.D. Toropina, Researcher at IKI RAN, Moscow.
4. G.S. Bisnovatyi-Kogan, Ph. D. Thesis adviser of M.V. Barkov, Researcher at IKI RAN, Moscow.
5. G.S. Bisnovatyi-Kogan, Ph. D. Thesis adviser of Ya.A. Bernshtein, Ph.D. student at IKI RAN, Moscow.
6. M. Khankhasayev. Adjunct Professor at the Department of Physics, Florida A&M University, Florida, USA, Fall Semester 2003; Course: Classical Mechanics.
7. V.S. Melezhik, Visiting Professor at the Department of Physics and Astronomy, California State University at Long Beach, Long Beach, California, USA, Winter Semester 2003; Course: Classical Mechanics.

7 Organizational activity

1. V.B. Belyaev: Member of the D. Sc. Panel of BLTP.
2. V.B. Belyaev: Member of the BLTP NTS.
3. V.B. Belyaev: Member of the International Advisory Committee for the 17th International IUPAP Conference on Few-Body Problems in Physics (June 5 – 10, 2003, Durham, North Carolina, USA).
4. G.S. Bisnovaty-Kogan: Member of the D. Sc. Panel of IKI RAN.
5. G.S. Bisnovaty-Kogan: Member of the D. Sc. Panel of GAISH MGU.
6. G.S. Bisnovaty-Kogan: Member of the Scientific Counsel of IKI RAN.
7. G.S. Bisnovaty-Kogan: Member of the Editorial Board of the “Astrophysics” journal (Armenian Academy of Sciences).
8. G.S. Bisnovaty-Kogan: Member of the Editorial Board of the journal “Gravitation and Cosmology” (Rus. Grav. Society).
9. M.Kh. Khankhasayev: Associate Director of the Institute for International Cooperative Environmental Research (ICEER) of the Florida State University, Tallahassee, Florida.
10. M.Kh. Khankhasayev: Member of the Executive Committee of the 6th International Symposium and Exhibition on Environmental Contamination in Central and Eastern Europe, 1-4 September 2003, Prague, Czech Republic.
11. M.Kh. Khankhasayev: Session Moderator, NATO/CCMS International Workshop “Landscape Science and Public Health Issues for Environmental Decision-Making in Central Asia”, 17 March 2003, Brussels, Belgium.
12. M.Kh. Khankhasayev: Co-Director, NATO/CCMS International Workshop “Water, Sanitation and Public Health Impacts in Rural Areas of Central Asia”, 4 – 5 November 2003, Almaty, Kazakhstan.
13. M.Kh. Khankhasayev: Member of the Editorial Committee of a Special Issue on Chernobyl Problems of the International Journal Environmental Science and Pollution Research (to be published in January 2004).
14. E.A. Kolganova: Member of Organizing Committee, Advanced Study Institute “Symmetries and Spin”, 12 – 19 July 2003, Prague, Czech Republic.
15. E.A. Kolganova: Member of Organizing Committee, Advanced Summer School on Modern Mathematical Physics, 11 – 22 July 2003, Dubna, Russia.
16. E.A. Kolganova: Member of Organizing Committee, NATO Advanced Research Workshop on High Energy Spin Physics, 16 – 20 September 2003, Dubna, Russia.
17. E.A. Kolganova: Support of the BLTP website.

18. A.K. Motovilov: Member of the BLTP NTS.
19. A.K. Motovilov: Member of the Ph. D. (C. Sc.) Panel of BLTP.
20. V.V. Pupyshev: Secretary of the BLTP exam committee on the speciality 01.04.16.