

# Curriculum Vitae

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March 14, 2004

### Personal Data

Date and Place of Birth:	October 31, 1957; Moscow, USSR (Russia)
Citizenship:	Russian
Family status:	Married, two sons

### Employment

2001-on: Head of Theory Division at Dzhelepov Laboratory of Nuclear Problems, JINR.

1999-on: Senior Research Scientist at DzhLNP, JINR.

1993-on: Scientific Secretary of Dzhelepov Laboratory of Nuclear Problems, JINR.

1987-1999: Research Scientist at DzhLNP, JINR.

1983-1987: Junior Research Scientist at DzhLNP, JINR.

1981-1983: Probation Researcher at LNP of JINR.

### Education background

May 1999 — Professor Habilitation in Particle and Nuclear Physics. Joint Institute for Nuclear Research, Russia. Thesis title: “Search for Supersymmetry in Rare Decays and Cosmology”.

June 1985 — Ph.D in Theoretical and Mathematical Physics. Joint Institute for Nuclear Research, Russia. Thesis title: “Development of the partonic picture of the nucleons in the deep inelastic interactions” (Supervisors Profs. P.S.Isaev and S.G.Kovalenko).

January 1981 — M.S. in Physics. Physics Department of the Moscow State University, Moscow (Supervisors Profs. P.S.Isaev and S.G.Kovalenko).

### Main field of scientific interest

My general scientific interest covers phenomenological aspects of Physics beyond the Standard Model with the emphasis on the interplay between the modern theory and the extremely high-accuracy non-accelerator experiments. My current research have centered around the investigations of discovery prospects of supersymmetry in the low-energy rare processes with elementary particles and nuclei as well as investigations of the neutrino properties. During a decade I have been involved in the theoretical support of the experimental SUSY dark matter search with high-purity Germanium detectors located deep

underground. To prove the discovery of the SUSY dark matter one needs an excellent detector with extremely low background, as well as a comprehensive theoretical view which incorporates coherently all experimental and astrophysical data.

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### Currently acting grants

Russian Coordinator for the grant from DFG (Joint German–Russian Research Project) “Experimental dark matter search with Germanium detectors and its theoretical support”. Grant No. 436 RUS 113/679/0-1(R). German Coordinator is Prof. H.V. Klapdor-Kleingrothaus from Max Planck Institut fuer Kernphysik, Heidelberg.

Principal Investigator of the Russian Foundation for Basic Research grant 02–02–04009 which is the Russian branch of the above-mentioned DFG grant.

Senior Researcher for the DFG grant (Joint German–Russian Research Project) “Possible evidence for dark matter compared with supersymmetry”. German Coordinator is Prof. W. de Boer, Institute fuer Experimental Kernphysik, Universität Karlsruhe.

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### Teaching experience

Lectures on the Origin and Detection of SUSY Dark Matter at Second Int. Summer Student School on Neutrino Physics (Alusta, 2003); XII Int. School “Particles and Cosmology” (Baksan, 2003); Int. School-seminar “Actual Problems of Particle Physics” (Gomel, 2001); JINR Young Scientists Conference (Dubna, 2001).

Discussion Leader at CERN–JINR European School on High-Energy Physics, Barcelona, Spain, May-June, 2004.

A full semester course of lectures on modern computing for student of Physics Department of Moscow State University, 1993.

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### Graduated students directed

2002: V. Gronewold, M.S. in Physics. Title: “Analysis of coannihilation effects on the neutralino relic density in the MSSM and their relevance to the dark matter searches” Heidelberg, Germany, Max Planck Inst. Supervision together with Prof. H.V. Klapdor-Kleingrothaus (MPI-K).

2001: E.Zaiti, M.S. in Physics. Title: “Effects of coannihilation processes on the MSSM neutralino relic density and predictions about SUSY dark matter” Heidelberg, Germany, Max Planck Inst. Supervision together with Prof. H.V. Klapdor-Kleingrothaus (MPI-K).

2000: H.Tu, M.S. in Physics. Title: “Higgs bosons and the indirect search for WIMPs”. Heidelberg, Germany, Max Planck Inst. Supervision together with Prof. H.V. Klapdor-Kleingrothaus (MPI-K).

1998: A.N. Kovalev, M.S. in Physics. Title: “Invisible Z boson width and restrictions on next-to-minimal supersymmetric standard model. (In Russian)”. Dubna, JINR.

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### Professional services

Organizer of International Conference on Non Accelerator New Physics in Dubna (NANP-1997, NANP-1999, NANPino, NANP-2001, NANP-2003). Together with Prof. S.G. Kovalenko and Prof. V.B. Brudanin.

Member of Organizing Committee of SUSY’01 Conference (Dubna, 2001).

Member of Organizing Committee of WEIN’92 Symposium on Weak and Electromagnetic interactions in Nuclei (Dubna, 1992).

Scientific secretary of the first JINR  $c\tau$ -factory workshop (Dubna, 1991).

Referring for:

Journal “Particles and Nuclei” (JINR, Dubna) and “Particles and Nuclei, Letters” (JINR, Dubna), “Physics of Atomic Nuclei”.

Fellow of:

Scientific Council for Ph.D degrees, Laboratory of Theoretical Physics, JINR.

Scientific Council for Ph.D and Habilitation degrees, DzhLNP, JINR, Russia.

Scientific-Technical Council, DzhLNP, JINR, Russia.

Editor board of journal “Physics of Atomic Nuclei”.

Jury on Pontecorvo stipendiary for young DzhLNP scientists.

Editor of:

Proceedings of International Conference on Non Accelerator New Physics in Dubna (NANP-1997, NANP-1999, NANPino, NANP-2001, NANP-2003).

Translation into Russian:

Book of H.V. Klapdor-Kleingrothaus and A. Staudt (MPI-K), “Non-accelerator particle physics”, IOP, 535 pages. Published in Russian in 1997.

Book of H.V. Klapdor-Kleingrothaus and K. Zuber (MPI-K), “Particle Astrophysics”, IOP, 507 pages. Published in Russian in 2000.

## **Awards**

The First Prize of Joint Institute for Nuclear Research for the cycle of works “QCD and parton picture in lepton-nucleon interactions”, Dubna, 1985.

The Third Prize of Joint Institute for Nuclear Research for the cycle of works “Physics beyond the Standard Model in low-energy processes and cosmology”, Dubna, 1999.

## **Professional publications**

In Refereed Journals [1–44];

In Conference Proceedings [45–69];

Technical Reports and Preprints [70–85],

Annual and Others Reports [86–98].

- [1] V. A. Bednyakov, H. V. Klapdor-Kleingrothaus, and V. Gronewold, “Squark-, slepton- and neutralino-chargino coannihilation effects in the low-energy effective MSSM”, *Phys. Rev.* **D66** (2002) 115005, hep-ph/0208178.
- [2] V. A. Bednyakov, H. V. Klapdor-Kleingrothaus, and E. Zaiti, “Slepton and neutralino/chargino coannihilations in MSSM”, *Phys. Rev.* **D66** (2002) 015010, hep-ph/0203108.
- [3] V. A. Bednyakov, “On possible lower bounds for the direct detection rate of SUSY dark matter”, *Phys. Atom. Nucl.* **66** (2003) 490–493, hep-ph/0201046.
- [4] V. A. Bednyakov, “On the origin of chemical elements”, *Phys. Part. Nucl.* **33** (2002) 473–496.
- [5] V. A. Bednyakov, “Why an investigation of ultra-high energy cosmic rays should be performed at the earth orbit”, *Phys. Part. Nucl.* **33** (2002) 583–598.
- [6] V. A. Bednyakov, H. V. Klapdor-Kleingrothaus, and H. Tu, “Higgs bosons and the indirect search for WIMPs”, *Phys. Rev.* **D64** (2001) 075004, hep-ph/0101223.

- [7] V. A. Bednyakov and H. V. Klapdor-Kleingrothaus, “Update of the direct detection of dark matter and the role of the nuclear spin”, *Phys. Rev.* **D63** (2001) 095005, hep-ph/0011233.
- [8] V. A. Bednyakov, “Implications of collider experiments for detecting cold dark matter”, *Phys. Atom. Nucl.* **63** (2000) 254–259.
- [9] V. A. Bednyakov, “On importance of dark matter for LHC physics”, *Part. Nucl. Lett.* **103** (2000) 12–24, hep-ph/0011207.
- [10] V. A. Bednyakov and H. V. Klapdor-Kleingrothaus, “Possibilities of directly detecting dark-matter particles in the next-to-minimal supersymmetric standard model”, *Phys. Atom. Nucl.* **62** (1999) 966–974.
- [11] V. A. Bednyakov, “Two-leptonic eta-meson decays and SUSY without R parity. (In Russian)”, *JINR Rapid Commun.* **1-93** (1999) 30–37.
- [12] V. A. Bednyakov and H. V. Klapdor-Kleingrothaus, “SUSY spectrum constraints on direct dark matter detection”, *Phys. Rev.* **D62** (2000) 043524, hep-ph/9908427.
- [13] V. A. Bednyakov, V. B. Brudanin, and S. G. Kovalenko, “Prospects for exploring R-parity-violating SUSY in  $0\nu\beta\beta$  experiments”, *Phys. Atom. Nucl.* **61** (1998) 998–1002.
- [14] V. A. Bednyakov and A. N. Kovalev, “Invisible Z boson width and restrictions on next-to-minimal supersymmetric standard model. (In Russian)”, *JINR Rapid Commun.* **4-90** (1998) 5–14.
- [15] V. A. Bednyakov, A. Faessler, and S. G. Kovalenko, “Super-Kamiokande constraints on R-parity violating supersymmetry”, *Phys. Lett.* **B442** (1998) 203–208, hep-ph/9808224.
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- [20] M. V. Altaisky, V. A. Bednyakov, S. G. Kovalenko, and M. N. Fomenko, “The Analytical constraints on charge / color breaking vacua in the MSSM”, *Mod. Phys. Lett.* **A11** (1996) 2213–2221.
- [21] W. de Boer *et al.*, “Combined Fit of Low Energy Constraints to Minimal Supersymmetry and Discovery Potential at LEP II”, *Z. Phys.* **C71** (1996) 415–430, hep-ph/9603350.
- [22] V. A. Bednyakov, S. G. Kovalenko, and H. V. Klapdor-Kleingrothaus, “Prospects in searches for cosmic dark matter in underground experiments”, *Phys. Atom. Nucl.* **59** (1996) 1718–1727.
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- [30] V. A. Bednyakov, “Superstring Z-prime boson at the c tau factory”, *Sov. J. Nucl. Phys.* **52** (1990) 949–952.
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- [54] J. Hellmig *et al.*, “Heidelberg dark matter search”, Proc. II Workshop on The dark side of the Universe: experimental efforts and theoretical framework, Rome 13-14 Nov, 1995.
- [55] W. de Boer *et al.*, “Constrained minimal supersymmetry and discovery potential at a linear collider” ,. Prepared for Physics with e+ e- Linear Colliders (The European Working Groups 4 Feb - 1 Sep 1995: Session 3), Hamburg, Germany, 30 Aug - 1 Sep 1995.
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