

CURRICULUM VITAE

1. PERSONAL DATA

- 1.1. *Name:* **Balakin Alexander.**
- 1.2. *Date of birth:* August 8, 1957.
- 1.3. *Place of birth:* Kazan, USSR.
- 1.4. *Citizenship:* Russian Federation.
- 1.5. *Address:*
 - Department of Theory of Relativity and Gravitation, Institute of Physics, Kazan Federal University, Kremlevskaya str.16, Kazan, 420008, RUSSIA .
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2. ACADEMIC DEGREES

1982 - Candidate of Physical and Mathematical Sciences (Ph.D.),

Kazan State University, Kazan, Russia.

Ph.D. Thesis Title: “Kinetics of collisionless plasma in the field of gravitational radiation”.

1999 - Doctor of Physical and Mathematical Sciences (Habilitation),

Kazan State University, Kazan, Russia.

Thesis Title: “Evolution of relativistic hierarchical systems in the field of gravitational radiation”.

3. EDUCATION

1974 – 1979 Graduate of Department of Theory of Relativity and Gravitation, Physics Faculty, Kazan State University, Kazan, USSR.

1979 – 1982 Post Graduate Course, Department of Theory of Relativity and Gravitation, Physics Faculty, Kazan State University, Kazan, USSR.

4. PROFESSIONAL EXPERIENCE

1982 - 1986 Lecturer, Senior Lecturer of the Department of Mathematics: Kazan Chemical – Technological Institute, Kazan, USSR.

1987 – 2000 Associated Professor of the Department of Theory of Relativity and Gravitation: Physics Faculty of Kazan State University, Kazan, RUSSIA.

2000 – 2003 Head of the Department of Theory of Relativity and Gravitation: Physics
Faculty of Kazan State University, Kazan, RUSSIA.

2003 - present time Full Professor of the Department of Theory of Relativity and Gravitation:
Physics Faculty of Kazan State University (Institute of Physics of Kazan Federal
University, starting from 2011), Kazan, RUSSIA.

Simultaneously:

1992 - 2003 Scientific Head of the Laboratory of Gravitational Wave Astronomy of
Kazan State University, Kazan, RUSSIA.

1994 – 2003 Head of the Department of Theoretical Problems of Kazan Scientific Center
of Gravitational Wave Research “Dulkyn”, Kazan, Tatarstan, RUSSIA.

5. QUALIFICATIONS

5.1. Specialist in the following scientific spheres:

- Exactly integrable covariant models of evolution of Relativistic Hierarchical Systems in a non-stationary gravitational fields (Gravitational Radiation and Cosmological models).
- Covariant modeling of irreversible, stochastic and critical phenomena induced by non-stationary gravitational fields in relativistic many-particle systems and continuous media.
- Theory of non-minimal coupling of scalar, pseudoscalar, electromagnetic, gauge fields with gravitation.
- Covariant electrodynamics of continuous media and axion electrodynamics.

5.2. Thirty five years experience in lecturing on the following subjects:

- Special and General Relativity.
- Relativistic Astrophysics and Cosmology.
- Theory of Detection of Gravitational Radiation.
- Experimental tests in General Relativity.
- Relativistic Theory of many-particle systems (relativistic kinetics, hydrodynamics, plasma theory and covariant electrodynamics of continuous media).
- Mathematical Methods in Physics.
- Differential and integral equations, variation analysis.

6. SCIENTIFIC COLLABORATION

Visiting Researcher:

- University of Konstanz, Germany: 1997, 1999, 2000, 2001, 2002, 2004, 2007, 2008.
- Universite’ Paris-VI, France: 1997, 1998.

- Institute Superior Tecnico, Lisbon, Portugal, 2000, 2004, 2011, 2013, 2015.
- Universitat Auto'noma de Barcelona, Spain, 2002, 2005.

7. AWARDS

- Honorable Mention of Gravity Research Foundation, 1988.
- Gold Medal and Diploma of 54th World Exhibition of Innovation, Research and New Technology "EUREKA!" (Brussels, 2005) for the invention "Gravitational Wave detector "Dulkyn"".
- Medal in memory of 1000th anniversary of Kazan, 2005.
- State Prize of the Republic of Tatarstan for Science and Technology, Kazan 2017.

7. PARTICIPATION IN THE CONFERENCES

Talks are presented on 35 International and 20 Russian conferences.

8. LIST OF PUBLICATIONS CONTAINS 191 ARTICLES.

20 избранных публикаций в журнале Physical Review D в 21 веке (2001-2021)

1. W. Zimdahl, D.J. Schwarz, A.B. Balakin, D. Pavo'n. Cosmic antifriction and accelerated expansion. *Physical Review D.*, Vol. 64, 063501, 2001. (статья цитирована **261** раз).
2. A. Balakin, R.A. Sussman and W. Zimdahl. The Maxwell – Boltzmann gas with non-standard self-interactions: a novel approach to galactic dark matter. *Physical Review D*, Vol. 70, 064027, 2004.
3. A. B. Balakin and W. Zimdahl. Anisotropic cosmological models with nonminimally coupled magnetic field. *Physical Review D.*, Vol. 71, 124014, 2005.
4. A.B. Balakin, S.V. Sushkov and A.E. Zayats. Non-minimal Wu-Yang wormhole. *Physical Review D*, Vol. 75, 084042, 2007.
5. Balakin A.B., Dehnen H. and Zayats A. E. Non-minimal Einstein-Yang-Mills-Higgs theory: Associated, color and color-acoustic metrics for the Wu-Yang monopole model. *Physical Review D*, Vol. 76, N 12, 124011, 2007.
6. Balakin A.B., Bochkarev V.V. and Lemos J.P.S. Non-minimal coupling for the gravitational and electromagnetic fields: black hole solutions and solitons. *Physical Review D*, Vol.77, N8, 084013, 2008.
7. Balakin A.B., Dehnen H. and Zayats A.E. Non-minimal monopoles of the Dirac type as realization of the censorship conjecture. *Physical Review D*, Vol. 79, N 2, 024007, 2009.
8. Balakin A.B., Lemos J.P.S. and Zayats A.E. Nonminimal coupling for the gravitational and electromagnetic fields: Traversable electric wormholes. *Physical Review D*, Vol. 81, N 8, 084015, 2010.
9. Balakin A.B. and Bochkarev V.V. Archimedean-type force in a cosmic dark fluid. I. Exact solutions for the late-time accelerated expansion. *Physical Review D* 83, N 2, 024035, 2011.

10. Balakin A.B. and Bochkarev V.V. Archimedean-type force in a cosmic dark fluid. II. Qualitative and numerical study of a multistage universe expansion. *Physical Review D* 83, N 2, 024036, 2011.
11. A.B. Balakin, V.V. Bochkarev and J.P.S. Lemos. Light propagation with non-minimal couplings in a two-component cosmic dark fluid with an Archimedean-type force, and unlighted cosmological epochs. *Physical Review D*, Vol. 85, N 6, 064015, 2012.
12. A.B. Balakin and V.V. Bochkarev, Archimedean-type force in a cosmic dark fluid. III. Big Rip, Little Rip and Cyclic solutions. *Physical Review D*, Vol. 87, N 2, 024006, 2013.
13. A.B. Balakin and N.N. Dolbilova, Electrodynamical phenomena induced by a dark fluid: Analogs of pyromagnetic, piezoelectric, and striction effects. *Physical Review D*, 2014, Vol. 89, N 10, 104012, 2014.
14. A.B. Balakin and A.E. Zayats. Dark energy fingerprints in the nonminimal Wu-Yang wormhole structure. *Physical Review D*, Vol. 90, N 4, 044049, 2014.
15. A. B. Balakin and V. A. Popov, Spin-axion coupling. *Physical Review D* Vol. 92, N. 10, 105025, 2015.
16. A.B. Balakin, J.P.S. Lemos and A.E. Zayats, Regular nonminimal magnetic black holes in spacetimes with a cosmological constant. *Physical Review D*, Vol.93, N 2, 024008, 2016.
17. A.B. Balakin, J.P.S. Lemos and A.E. Zayats, Magnetic black holes and monopoles in a nonminimal Einstein-Yang-Mills theory with a cosmological constant: Exact solutions. *Physical Review D*, Vol. 93, N 8, 084004, 2016.
18. A.B. Balakin. Axionic extension of the Einstein-aether theory. *Physical Review D*, 2016, Vol. 94, N 2, 024021, 2016. A.B. Balakin and D.E. Groshev, Polarization and stratification of axionically active plasma in a dyon magnetosphere. *Physical Review D*, Vol. 99, N. 2, 023006, 2019.
19. A.B. Balakin and D.E. Groshev, Magneto-electrostatics of axionically active systems: Induced field restructuring in magnetic stars. *Physical Review D*, Vol. 101, N 2, 023009, 2020.
20. A.B. Balakin and A.A. Galimova, Towards nonlinear axion-dilaton electrodynamics: How can axionic dark matter mimic dilaton-photon interactions? *Physical Review D*, Vol. 104, N 4, 044059, 2021.