

# CURRICULUM VITAE

## I. Personal Dates

Family Name	Zhuk
First Name	Alexander
Middle name	Ivanovich
Date of Birth	7 March 1954
Place of Birth	Chita, USSR
Marital Status	Married (04.11.1977), two sons (1987, 1990)
Citizenship	Ukraine
Address	Astronomical Observatory Odessa I.I. Mechnikov National University Street Dvoryanskaya, 2 Odessa 65082, Ukraine
E-mail Address	< <i>ai.zhuk2@gmail.com</i> >
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Spoken Languages	English - fluently; Italian, Spanish, Portuguese - fair

## II. Academic Degrees

Higher Education Diploma — **M.S.**  
23 February 1977  
Moscow Engineering Physical Institute  
Moscow, USSR  
Diploma with Honours in  
Theoretical Nuclear Physics

Diploma of Candidate of Sciences — **Ph.D.**  
2 November 1983  
P.N.Lebedev Physical Institute  
Moscow, USSR  
Academic Degree of Candidate of Sciences in  
Physics and Mathematics

Certificate of Senior Research Fellow  
10 May 1989  
Higher Attestation Commission attached to the  
USSR Council of Ministers  
Moscow, USSR  
Academic Title of Senior Research Fellow in  
Theoretical and Mathematical Physics

Diploma of Doctor of Sciences — **Habilitation**  
2 July 1999  
N.N. Bogolyubov Institute for Theoretical Physics  
Kiev, Ukraine  
Academic Degree of Doctor of Sciences in  
Theoretical Physics

## III. Education

September 1971 — February 1974  
University of Odessa  
Odessa, USSR  
General physics

February 1974 — February 1977  
Moscow Engineering Physical Institute  
Moscow, USSR  
Theoretical physics (field theory, general relativity)

May 1979 — May 1982  
P.N. Lebedev Physical Institute  
Moscow, USSR  
Post-graduate studies under  
the direction of Prof. V.P.Frolov  
Theoretical physics (quantum field theory, general relativity, cosmology)

#### **IV. Positions Held**

April 1977 — April 1979  
Junior Research Fellow  
Astronomical Observatory of Odessa University  
Odessa, USSR

November 1982 — December 1983  
Junior Research Fellow  
Department of Theoretical Physics  
University of Odessa  
Odessa, USSR

January 1984 — May 1992  
Senior Research Fellow  
Department of Theoretical Physics  
University of Odessa  
Odessa, Ukraine

June 1992 — September 1999  
Leading Research Fellow  
Department of Theoretical Physics  
University of Odessa  
Odessa, Ukraine

October 1999 — August 2006  
Chief Research Fellow  
Department of Theoretical Physics  
Odessa National University  
Odessa, Ukraine

September 2006 — present  
Professor  
Department of Theoretical Physics  
Odessa National University  
and  
Chief Research Fellow  
Astronomical Observatory  
Odessa National University  
Odessa, Ukraine

#### **V. Research area and present research problems**

Starting from 70th, when I was a student (in Moscow Engineering Physical Institute) under the supervision of the Prof. V.P. Frolov, I began investigations in the General Relativity: in Black Hole Physics and Cosmology. At that time we studied charged Black Holes moving in the

electromagnetic field. During postgraduate studies (in P.N. Lebedev Physical Institute, Moscow) under the supervision of the Prof. V.P. Frolov, we investigated Quantum Fields in the curved space-time, in particular, particle creation in different cosmological models. During one-year visit at the Cambridge University and work there under the supervision of the Prof. S.W. Hawking, I turned my interest to the Multidimensional Classical and Quantum Cosmology. In particular, it was proposed gauge covariant Wheeler-DeWitt equation which describes the quantum behavior of multidimensional Universe (Nuovo Cimento, 104B (1989) 575). This paper was highly cited. In many cases these models are integrable that resulted in a large number of new exact quantum and classical solutions. Then, my main interest was turned to the problem of the extra dimension stability. We proposed a general method for constructing multidimensional models with stable internal spaces (Phys. Rev. D56 (1997) 6391). For such models, it was shown that small conformal excitations of the internal spaces behave in our 4-D space-time as massive scalar fields, which we called gravitational excitons (later on, these massive geometrical moduli were referred to radions). The properties of gravexcitons were investigated in collaboration with Prof. A.A. Starobinsky (Phys. Rev. D69 (2004) 044003). We have shown that these particles may play the role of Dark Matter, and the minimum of an effective potential can be Dark Energy in our Universe.

We recently proposed (see JCAP, 09 (2012) 026; JCAP, 04 (2013) 010; JCAP, 05 (2014) 024) a new mechanical approach to problems of gravitational interaction and motion of galaxies on scales smaller than cosmological ones. At these scales, the Universe is filled with inhomogeneously distributed discrete structures (galaxies, groups and clusters of galaxies), which perturb the background Friedmann model. Here, the mechanical approach is the most appropriate to describe the dynamics of the inhomogeneities which is defined both by gravitational potentials of inhomogeneities and by the cosmological expansion of the Universe. It enables to study the large scale structure of the Universe, as well as its topology and constituents. The advantage of our approach is that we can carry out research analytically. The point is that there are a big number of different cosmological models at the present time which are almost indistinguishable experimentally from the standard LambdaCDM model. Therefore, it is very important to offer a theoretical test which can serve as a critical one for them. Obviously, if such a test exists, then supreme efforts of a lot of scientists all over the world working in both theoretical and experimental astrophysics and cosmology can be directed only to those models which successfully pass this test, while the others should be considered as forbidden and, therefore, not deserving of serious scientific attention. This will facilitate progress in understanding the Universe evolution and laws, predicting new gravitational effects (in particular, with the participation of dark matter and dark energy). As we have shown (Eur. Phys. J. C 74 (2014) 3005; Eur. Phys. J. C 74 (2014) 3011), our mechanical approach can be used as such a test. Summing up, the main objectives of my present research are: 1) further development of the mechanical approach, 2) the study of large-scale structure of the Universe, 3) the test of different alternative cosmological models.

I also want to continue the investigation of the higher dimensional gravitational theories. We are experts in this subject and published many papers in reputable scientific journals. At present, I focus on the problem of experimental verification of various gravitational Kaluza-Klein models.

## **VI. Professional Experience Abroad**

March 1987 – December 1987  
November 1990 – December 1990  
Senior Visitor at the  
Dept. of Applied Math. and  
Theor. Physics  
University of Cambridge  
Silver St., Cambridge CB3 9EW, UK

September 1992 – December 1992  
October 1993 – December 1993  
October 1994 – December 1994  
Visiting Scientist at the  
Institute for Theoretical Physics,  
Free University of Berlin  
Arnimallee 14, D-14195 Berlin, Germany

May 1993 – August 1993  
January 1994 – March 1994  
October 1994 – December 1994  
February 1996 – March 1996  
October 1996 – November 1996  
February 1998 – April 1998  
Visiting Scientist at the  
WIP-Gravitation Project  
at Potsdam University  
An der Sternwarte 16, D-14482 Potsdam, Germany

October 1995 – December 1995  
Visiting Scientist at the  
Institute for Theoretical Physics,  
Technical University of Berlin  
Hardenbergstrasse 36, D-10623 Berlin, Germany

October 1999  
Visiting Scientist at the  
Theoretical Astrophysics Center (TAC)  
Juliane Maries Vej 30, DK-2100 Copenhagen, Denmark

February 1999, January 2000, February 2003  
Visiting Scientist at the  
Max-Planck-Institut für Gravitationsphysik

Albert-Einstein-Institut  
Am Mühlenberg 1, D-14476 Golm bei Potsdam, Germany

May 2000 – June 2000  
Visiting Scientist at the  
University of Minnesota,  
Princeton, Columbia and Tufts Universities and  
Fermi National Accelerator Laboratory, USA

November 2000 – October 2001  
Professor at Sabbatical Leave  
Instituto de Matemáticas y Física Fundamental, CSIC,  
Madrid, Spain

April 2002 – July 2002  
Visiting Fellow at the  
Departamento de Física,  
Universidade da Beira Interior  
Covilhã, Portugal

August 2003 – October 2003  
Visiting Professor at the  
Departamento de Física,  
Universidade Federal da Paraíba  
João Pessoa, PB, Brazil

2003 – 2008  
Senior Associate at the  
Abdus Salam International Center  
for Theoretical Physics  
Trieste, Italy

September 2010 – February 2011  
Visiting Professor at the  
Faculdade de Física, Universidade Federal do Pará  
Belém, PA, Brazil

March 2007, March 2008, March 2009, June 2010, December 2011,  
September 2012, February 2013, February 2014, November 2015  
Visiting Scientist at the  
Theory Division, CERN  
Geneva, Switzerland

2009 – 2014  
Senior Associate at the  
Abdus Salam International Center  
for Theoretical Physics  
Trieste, Italy

November 2013  
Visiting Professor at the  
Instituto Superior Tecnico of Lisbon (CENTRA), Lisbon, Portugal,

February and November 2015  
Visiting Professor at the Universidade da Beira Interior,  
Covilhã, Portugal

## **VII. Collaborators**

Prof. A.A. Starobinsky, Landau Institute for Theoretical Physics,  
Moscow, Russia

Prof. V.N. Melnikov and Dr. V.D. Ivashchuk, Centre for Gravitation  
and Fundamental Metrology, Moscow, Russia

Prof. Hagen Kleinert, Free University of Berlin, Germany

Drs. Uwe Günther, Ulrich Bleyer, Martin Rainer and Uwe Kasper,  
Potsdam University, Germany

Prof. Pedro Gonzalez-Diaz and Dr. Mariam Bouhmadi-Lopez,  
Instituto de Matematicas y Física Fundamental, CSIC, Madrid, Spain

Prof. Paulo Moniz, Universidade da Beira Interior, Portugal

Prof. C. Romero and Prof. V.B. Bezerra,  
Departamento de Física, Universidade Federal da Paraíba,  
João Pessoa, PB, Brazil

Prof. L. Crispino,  
Faculdade de Física, Universidade Federal do Pará  
Belém, PA, Brazil

Prof. T. Kahniashvili,  
CCPP, New York University USA, and  
National Abastumani Astrophysical Observatory, Tbilisi, Georgia

Dr. M. Eingorn,  
Physics Department, North Carolina Central University,  
Durham, North Carolina, U.S.A.

Dr. Mariam Bouhmadi-Lopez,  
Universidade da Beira Interior, Portugal

## **VIII. Scientific publications.**

It was published more than 100 scientific papers in reputable refereed journals: Nuclear Physics B, Physical Review D, Physical Letters B, Class. Quant. Grav., General Relativity and Gravitation, JCAP, etc.

### **List of the main publications for last 5 years**

*Non-relativistic limit of multidimensional gravity: exact solutions and applications*,  
Classical and Quantum Gravity, 27 (2010) 055002.

*Bouncing inflation in nonlinear  $R^2 + R^4$  gravitational model*,  
Physical Review, D 81 (2010) 124002.

*Classical tests of multidimensional gravity: negative result*,  
Classical and Quantum Gravity, 27 (2010) 205014 [18 pages].

*Kaluza-Klein models: can we construct a viable example?*  
Physical Review, D83 (2011) 044005 [11 pages].

*Latent solitons, black strings, black branes, and equations of state  
in Kaluza-Klein models*,  
Physical Review, D84 (2011) 024031 [8 pages].

*Weak-field limit of  $f(R)$ -gravity in three and more spatial dimensions*,  
Physical Review, D84 (2011) 024023 [8 pages].

*Weak-field limit of Kaluza-Klein models with spherical compactification: experimental  
constraints*,  
Physical Review, D85 (2012) 064028 [8 pages].

*Non-relativistic limit of Randall-Sundrum model: solutions, applications and constraints*,  
General Relativity and Gravitation, 44 (2012) 2257-2270.

*Asymptotic latent solitons, black strings and black branes in  $f(R)$ -gravity*,  
Physical Review, D85 (2012) 064030 [5 pages].

*Exact and asymptotic black branes with spherical compactification*,  
Physical Review, D86 (2012) 024025 [6 pages].

*Remarks on gravitational interaction in Kaluza-Klein models*,  
Physics Letters, B 713 (2012), pp. 154-159.

*Significance of tension for gravitating masses in Kaluza-Klein models*,  
Physics Letters, B 716 (2012), pp. 176-178.

*Hubble flows and gravitational potentials in observable Universe*,  
JCAP **09** (2012) 026 [21 pages].

*Kaluza-Klein models with spherical compactification: observational constraints and possible examples.*

Classical and Quantum Gravity, 30 (2013) 115004 [17 pages].

*Dynamics of astrophysical objects against the cosmological background.*

JCAP, 04 (2013) 010 [22 pages].

*Dark matter and dark energy from quark bag model.*

JCAP, 08 (2013) 002 [14 pages].

*Dark Energy: Observational Evidence and Theoretical Models (1st volume of three-volume book "Dark energy and dark matter in the Universe ed. V. Shulga),*

Akadempriodyka, Kiev (2013), (arXiv:1502.04177).

*Many-body problem in Kaluza-Klein models with toroidal compactification.*

Eur. Phys. J. C 74 (2014) 2700 [9 pages].

*Remarks on mechanical approach to observable Universe.*

JCAP, 05 (2014) 024 [19 pages].

*Scalar perturbations in cosmological models with quark nuggets.*

Eur. Phys. J. C 74 (2014) 3011 [7 pages].

*$f(R)$  gravity: scalar perturbations in the late Universe.*

Eur. Phys. J. C 74 (2014) 3005 [9 pages].

*Problematic aspects of Kaluza-Klein excitations in multidimensional models*

Physics Letters, B 736 (2014) 329-332.

*Rigorous theoretical constraint on constant negative EoS parameter  $\omega$  and its effect for the late Universe.*

Eur. Phys. J. C 75 (2015) 118 [9 pages].

*Lattice Universe: examples and problems.*

Eur. Phys. J. C 75 (2015) 217 [10 pages].

*Are dark energy models with variable EoS parameter  $w$  compatible with the late inhomogeneous Universe?*

JCAP 07 (2015) 038 [14 pages].

## **IX. List of participation in conferences and workshops for last 5 years**

X-th International Conference "Relativistic Astrophysics, Gravitation and Cosmology", Kyiv, Ukraine, May 19-22, 2010.

10-th Odessa International Astronomical Gamow Conference-School  
"Astronomy and Beyond: Astrophysics, Cosmology and Gravitation,  
Cosmomicrophysics, Radio-Astronomy and Astrobiology",  
Odessa, Ukraine, August 23-28, 2010. (Vice-Chairman).

XV International Baksan School "Particles and Cosmology",  
Troitsk, Moscow region, Russia, May 26- June 2, 2011.

International conference "Astroparticle Physics, Gravitation and Cosmology",  
Kyiv, Ukraine, June 7-10, 2011.

11-th International Gamow Conference-School "Astronomy and Beyond:  
Astrophysics, Cosmology and Gravitation, Cosmomicrophysics, Radio-Astronomy  
and Astrobiology",  
Odessa, Ukraine, August 22-28, 2011. (Vice-Chairman).

International Conference dedicated to the memory of A.V. Mandzhos  
"Astronomy and Space Physics in Kyiv University",  
Kyiv, Ukraine, May 22-25, 2012.

Workshop on Effective Gravity in Fluids and Superfluids, The Abdus Salam  
International Center For Theoretical Physics,  
Trieste, Italy, July 09-13 2012.

Summer School on Cosmology, The Abdus Salam  
International Center For Theoretical Physics,  
Trieste, Italy, July 16-27 2012.

12-th Odessa International Astronomical Gamow Conference-School  
"Astronomy and Beyond: Astrophysics, Cosmology and Gravitation,  
Cosmomicrophysics, Radio-Astronomy and Astrobiology",  
Odessa, Ukraine, August 20-26, 2012. (Vice-Chairman).

International conference: Astronomy and Space Physics in Kyiv University,  
Kyiv, Ukraine, May 21-24, 2013.

XII-th International school-seminar: The actual problems of microworld physics,  
Gomel, Belarus, July 22  $\bar{\cup}$  August 2, 2013.

13-th Odessa International Astronomical Gamow Conference-School  
"Astronomy at the intersection of science: Astrophysics, Cosmomicrophysics,  
Cosmology and Gravity, Radioastronomy and Astrobiology",  
Odessa, Ukraine, August 19-25, 2013. (Vice-Chairman).

International conference: Astronomy and Space Physics in Kyiv University,  
Kyiv, Ukraine, May 27-30, 2014.

18-th International Seminar on High Energy Physics "Quarks-2014

Suzdal, Russia, 2-8 June, 2014.

14-th Odessa International Astronomical Gamow Conference-School  
"Astronomy and Beyond: Astrophysics, Cosmology and Gravitation,  
Cosmomicrophysics, Radio-Astronomy and Astrobiology",  
Odessa, Ukraine, August 17-24, 2014. (Vice-Chairman).

International conference: Primeiro encontro de Cosmologia e Geavitacao  
a Beira da Serra da Estrela, Covilha, Portugal, February 20-21, 2015.

International conference: Astronomy and Space Physics in Kyiv University,  
Kyiv, Ukraine, May 25-29, 2015.

XIII-th International school-seminar: The actual problems of microworld physics,  
Gomel, Belarus, July 27  $\bar{\bar{I}}$  August 7, 2015.

5-th Gamow International Conference Dedicated to 111-th Anniversary  
of George Gamow "Astrophysics and Cosmology after Gamow - Progress and  
new Perspectives", Odessa, Ukraine, August 16-23, 2015. (Vice-Chairman).

## **X. List of Funded Research Projects**

The study of back reaction of the metric fluctuations in  
multidimensional quantum cosmology. State Committee of Science and  
Technology of Ukraine, 1992-1993.

The role of quantum cosmology in elementary particle physics.  
Ministry of Higher Education of Ukraine, 1992- 1994.

Internal space compactification in multidimensional quantum  
cosmology. Ministry of Higher Education of Ukraine, 1994 - 1996.

Inflation in multidimensional quantum cosmology. Ministry of  
Higher Education of Ukraine, 1997 - 1999.

Collective excitations and evolutionary processes. Ministry of  
Education and Science of Ukraine, 2000-2002.

"Cosmomicrophysics"programme of the Physics and Astronomy Division  
of the National Academy of Sciences of Ukraine, 2007-2009.

"Cosmomicrophysics"programme of the Physics and Astronomy Division  
of the National Academy of Sciences of Ukraine, 2010-2012.

Study of stellar physics, galactic components and their gravitational fields  
to test the evolution of the galaxy and the universe. Ministry of  
Education and Science of Ukraine, 2012-2014.

Study of the origin of chemical elements, structures and evolution of stars,

interstellar medium, galaxies and the large scale structure of the Universe.  
Ministry of Education and Science of Ukraine, 2015-2017.

## **XI. Awards and honors**

DFG Grants (Potsdam University, Free University of Berlin, Technical University of Berlin), Germany, 1993-1998.

DAAD Grant (Free University of Berlin), Germany, 1993.

Spain Sabbatical Grant (IMFF (CSIC)), Spain, 2000-2001.

Portugal BCC (CENTRA-IST) Grant, Portugal, 2002.

Brazilian CNPq Grant (University of Paraiba), Brazil, 2003.

Senior Associate at the Abdus Salam International Center for Theoretical Physics, Trieste, Italy, 2003-2008.

George Gamow Honorary Medal,  
Odessa National University, Odessa, Ukraine, 2004.

Senior Associate at the Abdus Salam International Center for Theoretical Physics, Trieste, Italy, 2009-2014.

Brazilian CAPES Grant (University of Para), Brazil, 2010.

Numerous grants of CERN (Theory Division), 2006 - present.

State Prize of Ukraine in Science and Technology, 2014.

## **XII. Professional service**

International Astronomical Union (IAU), member.

Russian Gravitational Society, member of Presidium

Euro-Asian Astronomical Society, member.

Academic Council for Ph.D and Doctor of Sciences (Odessa University),  
member, 2000-present.

Referee for the journals: Classical and Quantum Gravity, General Relativity and Gravitation, Int. Journ. Mod. Phys., Physics of Atomic Nuclei, Phys. Lett. A., Phys. Lett. B, Ukrainian Journal of Physics, JCAP.

Reviewer for the Mathematical Reviews.

## LIST OF PUBLICATIONS

### Publications in international refereed journals

1. Zhuk A.I. *Problem of the boundary condition in Quantum Cosmology: simple example*. Classical and Quantum Gravity, 5 (1988) p. 1357-1365.
2. Ivashchuk V.D., Melnikov V.N., Zhuk A.I. *On Wheeler-DeWitt equation in multidimensional cosmology*. Nuovo Cimento, 104B (1989) p. 575-582.
3. Bleyer U., Liebscher D.-E., Schmidt H.-J., Zhuk A.I. *On the Wheeler-DeWitt equation in the multidimensional cosmology with phenomenological matter*. Wissenschaftliche Zeitschrift, 39 (1990) p. 20-24.
4. Zhuk A.I. *Multidimensional quantum wormholes*. Physical Review, 45D (1992) p. 1192-1197.
5. Zhuk A.I. *Integrable multidimensional quantum cosmology*. Classical and Quantum Gravity, 9 (1992) p. 2029-2038.
6. Zhuk A.I. *Perfect fluid wormholes*. Phys. Lett., A176 (1993) p. 176-178.
7. Bleyer U., Ivashchuk V.D., Melnikov V.N., Zhuk A. *Multidimensional classical and quantum wormholes in models with cosmological constant*. Nucl. Phys. B429 (1994) p. 177-204 (gr-qc/9405020).
8. Bleyer U., Zhuk A., *On multidimensional cosmological models with static internal spaces*. Classical and Quantum Gravity, 12 (1995) p. 89-100 (gr-qc/9405022).
9. Bleyer U., Zhuk A., *Scalar field instability in multidimensional cosmology*. Astronomische Nachrichten. 316 (1995) p. 197-204.
10. Zhuk A., *Generalized deSitter solution in multidimensional cosmology with static internal space*. Astronomische Nachrichten. 316 (1995) p. 269-274 (gr-qc/0205116).
11. Bleyer U., Zhuk A., *Multidimensional integrable cosmological models with positive external space curvature*. Gravitation & Cosmology. 1 (1995) p. 37-45 (gr-qc/9405028).
12. Bleyer U., Zhuk A., *Multidimensional integrable cosmological models with negative external space curvature*. Gravitation & Cosmology. 1 (1995) p. 106-118 (gr-qc/9405019).
13. Zhuk A., *On thermodynamics in multidimensional cosmology*. Gravitation & Cosmology. 2 (1995) p. 119-120.

14. Bleyer U., Zhuk A., *Kasner-like, inflationary and steady-state solutions in multidimensional cosmology*. *Astronomische Nachrichten*. 317 (1996) p. 161-173.
15. Zhuk A., *Multidimensional quantum cosmology: quantum wormholes, third quantization, inflation from "nothing etc.* *Gravitation & Cosmology*. 2 (1996) p. 17-26 (gr-qc/9611057).
16. Kasper U., Zhuk A., *Integrable multicomponent perfect fluid multidimensional cosmology: I*. *General Relativity and Gravitation*, 28 (1996) p. 1269-1292.
17. Zhuk A., *Integrable scalar field multidimensional cosmologies*. *Classical and Quantum Gravity*, 13 (1996) p. 2163-2178.
18. Rainer M., Zhuk A., *Tensor-multi-scalar theories from multidimensional cosmology*. *Physical Review*, D54 (1996) p. 6186-6192 (gr-qc/9608020).
19. Zhuk A., *On a relation between string theory and multidimensional cosmology*. *Gravitation & Cosmology*. 2 (1996) p. 319-320 (gr-qc/9611011).
20. Zhuk A., *Multidimensional topological chain splitting*. *Gravitation & Cosmology*. 3 (1997) p. 24-28 (gr-qc/9701037).
21. Kasper U., Rainer M., Zhuk A., *Integrable perfect fluid multidimensional cosmology II : Scalar field cosmology*. *General Relativity and Gravitation*, 29 (1997) p. 1123-1162 (gr-qc/9705046).
22. Günther U., Zhuk A., *Gravitational excitons from extra-dimensions*. *Physical Review*, D56 (1997) p. 6391-6402 (gr-qc/9706050).
23. Günther U., Kriskiv S., Zhuk A. *On stable compactification with Casimir - like potential*. *Gravitation & Cosmology*. 4 (1998) p. 1-16 (gr-qc/9801013).
24. Günther U., Zhuk A., *Multidimensional perfect fluid cosmology with stable compactified internal dimensions*. *Classical and Quantum Gravity*, 15 (1998) p. 2025-2035 (gr-qc/9804018).
25. Günther U., Zhuk A., *Observable effects from extra dimensions*. *Gravitation & Cosmology*. 5 (1999) p. 167-169 (gr-qc/9905109).
26. Rainer M., Zhuk A., *Einstein and Brans-Dicke frames in multidimensional cosmology*. *General Relativity and Gravitation*, 32 (2000) p. 79-104 (gr-qc/9808073).
27. Günther U., Zhuk A., *Stabilization of internal spaces in multidimensional cosmology*. *Physical Review*, D61 (2000) 124001 [10 pages] (hep-ph/0002009).

28. Günther U., Zhuk A., *Remarks on dynamical stabilization of internal spaces in multidimensional cosmology*. Classical and Quantum Gravity, 18 (2001) p. 1441-1460, (hep-ph/0006283).
29. Bouhmadi-López M., Zhuk A., *Comments on conformal stability of brane-world models*. Physical Review, D65 (2002) 044009 [11 pages], (hep-th/0107227).
30. Bouhmadi-López M., González-Díaz P.F., Zhuk A., *On new gravitational instantons describing creation of brane-worlds*. Classical and Quantum Gravity, 19 (2002) p. 4863-4876, (hep-th/0208226).
31. Zhuk A., *Restrictions on dilatonic brane-world models*. Int. Journ. Mod. Phys. D11 (2002) p. 1399-1407, (hep-ph/0204195).
32. Günther U., Moniz P., Zhuk A., *Asymptotical AdS from non-linear gravitational models with stabilized extra dimensions*. Physical Review D66 (2002) 044014 [9 pages]; Physical Review, D66 (2002) 089901(E) [1 page], (hep-th/0205148).
33. Bouhmadi-López M., González-Díaz P.F., Zhuk A., *Topological defect brane-world models*. Gravitation & Cosmology, 8 (2002) p. 285-293, (hep-th/0207170).
34. Günther U., Moniz P., Zhuk A., *Multidimensional cosmology and asymptotical AdS*. Astrophysics and Space Science, 283(4) (2003) p. 679-684, (gr-qc/0209045)
35. Günther U., Moniz P., Zhuk A., *Nonlinear multidimensional cosmological models with form fields: stabilization of extra dimensions and the cosmological constant problem*. Physical Review, D68 (2003) 044010 [16 pages], (hep-th/0303023).
36. Günther U., Starobinsky A., Zhuk A., *Multidimensional cosmological models: cosmological and astrophysical implications and constraints*. Physical Review D69 (2004) 044003 [12 pages], (hep-ph/0306191).
37. Günther U., Zhuk A., *Massive scalar fields in the early Universe*. Int. Journ. Mod. Phys. D13 (2004) p.1167-1175; (astro-ph/0311093).
38. Günther U., Zhuk A., Bezerra V.B., Romero C., *AdS and stabilized extra dimensions in multidimensional gravitational models with nonlinear scalar curvature terms  $R^{-1}$  and  $R^4$* . Classical and Quantum Gravity, 22 (2005) p.3135-3167; (hep-th/0409112).
39. Baukh V., Zhuk A., *Sp-brane accelerating cosmologies*. Physical Review, D73 (2006) 104016 [16 pages], (hep-th/0601205).
40. Saidov T., Zhuk A., *AdS non-linear curvature-squared and curvature-quartic multidimensional ( $D=8$ ) gravitational models with stabilized extra dimensions*. Gravitation & Cosmology, 12 (2006) p. 253-261 (hep-th/0604131).

41. Saidov T., Zhuk A., *A nonlinear multidimensional gravitational model  $R+1/R$  with form fields and stabilized extra dimensions*. Astronomical and Astrophysical Transactions, 25 (2006) p. 447-453.
42. Baukh V., Zhuk A., *Sp-branes: integrable multidimensional cosmologies*. Astronomical and Astrophysical Transactions, 25 (2006) p. 441-446.
43. Zhuk A., *Effective Friedmann model from multidimensional cosmologies*. Astronomical and Astrophysical Transactions, 25 (2006) p. 435-440.
44. Saidov T., Zhuk A.,  *$1/R$  multidimensional gravity with form-fields: Stabilization of extra dimensions, cosmic acceleration, and domain walls*. Physical Review, D75 (2007) 084037 [11 pages], (hep-th/0612217).
45. Baukh V., Zhuk A., Kahniashvili T., *Extra dimensions and Lorenz invariance violation*. Physical Review, D76 (2007) 027502 [4 pages], (arXiv:0704.0314).
46. Saidov T., Zhuk A., *Problem of inflation in nonlinear multidimensional cosmological models*. Physical Review, D79 (2009) 024025 [16 pages], (arXiv:0809.5226).
47. Eingorn M., Zhuk A., *Multidimensional gravity in non-relativistic limit*. Physical Review, D80 (2009) 124037 [5 pages], (arXiv:0907.5371).
48. Eingorn M., Zhuk A., *Non-relativistic limit of multidimensional gravity: exact solutions and applications*. Classical and Quantum Gravity, 27 (2010) 055002 [17 pages], (arXiv:0910.3507).
49. Saidov T., Zhuk A., *Bouncing inflation in nonlinear  $R^2 + R^4$  gravitational model*. Physical Review, D81 (2010) 124002 [14 pages], (arXiv:1002.4138).
50. Eingorn M., Zhuk A., *Classical tests of multidimensional gravity: negative result*. Classical and Quantum Gravity, 27 (2010) 205014 [18 pages], (arXiv:1003.5690).
51. Eingorn M., Zhuk A., *Kaluza-Klein models: can we construct a viable example?* Physical Review, D83 (2011) 044005 [11 pages], (arXiv:1010.5740).
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