

PROGRAM

PETROV 2010 ANNIVERSARY SYMPOSIUM ON GENERAL RELATIVITY AND GRAVITATION

Kazan, Russia, November 1 – 6, 2010

Monday, November 1

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| 8.00 – 20.00 | Registration |
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Excursions:

“Department of manuscripts and rare books of Lobachevsky Scientific Library of Kazan Federal University”, from 1:30 pm (free of charge).

"Kazan city" (Kremlin, Annunciation Cathedral, the Qol-Şarif mosque, Art Gallery “Hazine”), from 3 pm to 6 pm.

Tuesday, November 2

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| 8.00 – 10.00 | Registration |
| 10.00 – 11.45 | <u>Opening Ceremony</u> <ul style="list-style-type: none">• I.R. Gafurov, Rector of Kazan University. Welcome• A.V. Aminova (KFU, Russia). A. Z. Petrov: Life and activity• Greetings:<ul style="list-style-type: none">- Prof. G.S. Bisnovaty-Kogan (Space Research Institute, Moscow)- Prof. D.R. Brill (University of Maryland, USA)- Prof. R. Kerner (Université Pierre-et-Marie-Curie, France)• Divertissement |
| 11.45 – 12.45 | Excursion into the Museum of History of Kazan Federal University |
| 13.00 – 15.00 | <i>Lunch</i> |

Plenary Session: Chair A.V. Aminova (KFU, Russia)

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| 15.00 – 15.30* | D.R. Brill (University of Maryland, USA). The beginnings of black-hole horizons |
| 15.30 – 16.00 | V.N. Lukash (Lebedev Physics Institute, Russia). Pillars of physical cosmology |
| 16.00 – 16.30 | M.V. Sazhin (Sternberg astronomical institute, Moscow). Investigation of cosmological perturbation by astronomical methods |

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| 16.30 – 17.00 | <i>Coffee-break</i> |
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* 30 min = 25 min (talk) + 5 min (discussion).

Plenary Session: Chair D.R. Brill (University of Maryland, USA)

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| 17.00 – 17.30 | J.P.S. Lemos (Instituto Superior Tecnico, Portugal). Black holes and quasi black holes: properties, similarities and differences |
| 17.30 – 18.00 | I.G. Dymnikova (University of Warmia and Mazury, Poland). Petrov's Classification and Vacuum Dark Fluid |
| 18.00 – 18.30 | Kim Sung-Won. (Ewha Womans University, Korea) Cosmological Perturbation and Dark Energy |
| 18.30 – 19.00 | V.A. Berezin (Institute for Nuclear Research, Moscow, Russia). Classical analog of quantum Schwarzschild black hole and mystery of "log 3" |
| 19.00 | <i>Welcome party</i> |

Wednesday, November 3

Plenary session: Chair V.N. Lukash (Lebedev Physics Institute, Russia)

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| 9.00 – 9.30 | G.S. Bisnovaty-Kogan (Space Research Inst. RAS, Moscow). Neutrino in the Universe |
| 9.30 – 10.00 | Kim Young Suh (University of Maryland, U.S.A.). Internal Space-time Symmetries according to Einstein, Wigner, Dirac, and Feynman |
| 10.00 – 10.30 | A.A. Grib (Russian State Pedagogical University, St. Petersburg). Active galaxy cores as elementary particle supercolliders |
| 10.30 – 11.00 | M. Bordag (Germany). On the Casimir entropy for a ball in front of a plane |

11.00 – 11.30 Coffee-break

Plenary session: Chair R. Kerner (Université Pierre et Marie Curie, France)

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| 11.30 – 12.30 | Reminiscences about A.Z. Petrov <ul style="list-style-type: none">• N.N. Neprimerov (KFU, Russia). Gravity with spin: The collaborated work with A.Z. Petrov• E.A. Tagirov (Joint Institute for Nuclear Research, Dubna). My reminiscences about A.Z. Petrov• N.P. Konopleva (Russia). Remembering A.Z. Petrov |
| 12.30 – 13.00 | A.Ya. Burinsky (NSI Russian Academy of Sciences, Moscow). Algebraically Special Kerr-Schild Fields, the Kerr Theorem and the Exact Kerr-Schild Solutions |
| 13.00 – 13.30 | D.V. Galtsov (MSU, Russia). Seeing invisible |

13.30 – 15.00 Lunch

Parallel sessions

Session I: Chair S.V. Sushkov (KFU, Kazan)

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| 15.00 – 15.20* | Ahsan Zafar (Aligarh Muslim University, India). A study of the Riemann curvature tensor and Petrov classification in general relativity |
| 15.20 – 15.40 | Bali Raj (University of Rajasthan, India). Bianchi Type I Massive String Cosmological Model with Free Gravitational Field of Petrov Type I Degenerate |
| 15.40 – 16.00 | Pradhan Anirudh. (Hindu P.G. College, V.B.S. Purvanchal university, India). Anisotropic Bianchi Type-I Massive String Cosmological Models in General Relativity |
| 16.00 – 16.20 | A.V. Toporensky. (Sternberg Astronomical Institute, Russia) Regular and chaotic regimes in FRW scalar field cosmology |
| 16.20 – 16.40 | Yu.V. Pavlov. (Institute of Problems in Mechanical Engineering RAS, Russia) Exact solutions for a scalar field in homogeneous isotropic cosmological models and particle creation |

*20 min = 15 min (talk) + 5 min (discussion).

Session II: Chair V.V. Shurygin (KFU, Kazan)

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| 15.00 – 15.20 | A.A. Salimov (Ataturk University, Turkey). Differential Geometry of Walker Manifolds |
| 15.20 – 15.40 | I.A. Gordeeva (Vladimir State Pedagogical University, Russia). Riemannian-Cartan manifolds |
| 15.40 – 16.00 | A.V. Kuleshov. (Immanuel Kant State University of Russia, Kaliningrad) Обобщенные связности на комплексе центрированных плоскостей в проективном пространстве (Generalized connections on a complex of centralized planes in projective space) |
| 16.00 – 16.20 | V. Lukianov. (Nizhny Novgorod State Technical University, Russia). Связь уравнений Янга-Миллса с уравнениями Эйнштейна и Максвелла (Connection between Yang-Mills equations and Einstein and |

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| | Maxwell equations) |
| 16.20 – 16.40 | I.N. Shurnikov. (MSU, Russia) On a number of regions of projective space separated by N plates |

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| 16.40 – 17.00 | <i>Coffee-break</i> |
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Session I: Chair **N.R. Khusnutdinov** (KFU, Kazan)

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| 17.00 – 17.20 | Erico Tanaka (Palacky University, Czech Republic). Hamilton equations of general relativity |
| 17.20 – 17.40 | V.V. Voytik (BSPU, Ufa). The principle of common forminvariance and its consequences |
| 17.40 – 18.00 | K. Andreev (Russia). О спинорном формализме при четном n (On spinor formalism for even n) |
| 18.00 – 18.20 | A.S. Galaev (Masaryk University in Brno, Czech Republic). On the Einstein equation on Lorentzian manifolds admitting recurrent lightlike vector fields |
| 18.20 – 18.35 | A.E. Zayats (Kazan Federal University, Russia). Classification of optical metrics in terms of Petrov types for non-minimal Einstein-Maxwell models |
| 18.35 – 18.50 | F.Sh. Zaripov (Kazan). A conformally invariant generalization of string theory to higher-dimensional objects: Hierarchy of coupling constants |
| 18.50 – 19.05 | T. Alpin (Kazan Federal University, Russia). Anomaly increasing of electric and magnetic fields as a dynamo-optical effect induced by gravitational radiation |

Session II: Chair **G.A. Tolstikhina** (Tver State University, Russia)

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| 17.00 – 17.20 | P.I. Troshin (KFU, Russia). On Measure Invariance for a 2-valued Transformation |
| 17.20 – 17.40 | K.V. Polyakova (Immanuel Kant State University of Russia, Kaliningrad). Обобщенный внешний дифференциал и его приложение |
| 17.40 – 18.00 | L.N. Romakina (Saratov State University, Russia). Черепичные разбиения гиперболической плоскости |

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| | положительной кривизны, порожденные правильным n -контуром |
| 18.00 – 18.20 | V.M. Svirkin (Omsk Branch of Institute of Mathematics). Спектр лапласиана простых групп Ли ранга один и два |
| 18.20 – 18.40 | Yu.I. Shevchenko (Immanuel Kant State University of Russia, Kaliningrad). Тензор кривизны-кручения обобщенной проективной связности на распределении |
| 18.40 – 19.00 | Yu.I. Ponomarenko (Belarussian State University, Belarus). Regular maps on two-dimensional surfaces |

Thursday, November 4

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| 10.00 – 13.00 | Excursion: "Raifa monastery", from 10 am to 1 pm. (Raifa monastery in the vicinity of Kazan, about 40 km). |
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Plenary session: Chair A.M. Shelekhov (Tver State University, Russia)

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| 15.00 – 15.30 | V.N. Berestovsky (Omsk Branch of Sobolev Institute of Mathematics). Об одной задаче В.А.Топоногова и ее обобщениях (On one problem by V.A. Toponogov and its generalizations) |
| 15.30 – 16.00 | S.V. Galaev (Saratov State University, Russia). Generalization of the Wagner curvature tensor for nonholonomic manifolds of codimension 1 with a Finsler metric |
| 16.00 – 16.30 | G.A. Tolstikhina (Tver State University, Russia). Bol transformation quasigroups and three-webs defined by them |

16.30 – 17.00 *Coffee-break*

Plenary session: Chair V.N. Berestovsky (Omsk Branch of Sobolev Institute of Mathematics, Russia)

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| 17.00 – 17.30 | L.I. Petrova (MSU, Russia). Особенности уравнений теории поля |
| 17.30 – 18.00 | A.M. Shelekhov (Tver State University, Russia). Closed G-structure defined by three-webs |
| 18.00 – 18.30 | V.A. Igoshin (Nizhnii Novgorod State Technical University, Russia). Cartan-Shapiro-Petrov problem of geodesic modeling |
| 18.30 – 19.00 | V.V. Shurygin (Kazan Federal University, Russia). Lie jets and prolongations of geometric objects to second order tangent bundles |

19.00 *Banquet*

Friday, November 5

Plenary session: Chair D.V. Galtsov (MSU, Russia)

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| 9.00 – 9.30 | S.E. Stepanov (Financial Academy, Moscow). Infinitesimal harmonic and isometric transformations and Ricci solitons |
| 9.30 – 10.00 | P. Kuusk (University of Tartu, Estonia). Theories of cosmology: beyond the Concordance Model |
| 10.00 – 10.30 | R. Kerner (Université Pierre et Marie Curie, France). New approximation methods in the two-body problem |
| 10.30 – 11.00 | R.F. Polischuk (Lebedev Physical Institute, Astro Space Center, Russia). Типы Петрова и геометрия пространства-времени (Petrov types and spacetime geometry) |

11.00 – 11.30 *Coffee-break*

Plenary session: Chair V.A. Berezin (Institute for Nuclear Research, Russian Academy of Sciences, Russia)

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| 11.30 – 12.00 | M.O. Katanaev (Steklov mathematical institute, Russia). Tube dislocations in gravity |
| 12.00 – 12.30 | E.A. Tagirov (Joint Institute for Nuclear Research, Russia). Quantum Mechanics in Curved Spaces from Schrodinger up to Nowadays |
| 12.30 – 13.00 | B. Khots (Compressor Controls Corporation, USA). Observer's Mathematics applications to the Number theory, Geometry, Analysis, Classical and Quantum Mechanics |
| 13.00 – 13.30 | A.N. Golubyatnikov (MSU, Russia). Relativistic media with geometrical constraints |

13.30 – 15.00 *Lunch*

Parallel sessions

Session I: Chair Raj Bali (University of Rajasthan, India)

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| 15.00 – 15.20 | E.A. Mena (Centro Universitario de la Ciénega, Universidad de Guad, Mexico). Solutions in NonCommutative Quantum Cosmology |
| 15.20 – 15.40 | P.O. Kazinski (Tomsk State University, Russia). Dependence of masses of particles of the Standard Model on a gravitational field |
| 15.40 – 16.00 | V.L. Kauts (Astro Space Center of Lebedev Physical Institute of RAS, Russia). Annihilation of the dark matter near to gravitating objects |
| 16.00 – 16.20 | S.V. Pilipenko (Astro Space Center of Lebedev Physical Institute of RAS, Russia). Internal structure of dark-matter halos |
| 16.20 – 16.40 | S. Pavluchenko (Special Astrophysical Observatory of the RAS, Russia). The dynamics of the flat anisotropic models in the Lovelock gravity |

Session II: Chair S.V. Galaev (Saratov State University, Russia)

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| 15.00 – 15.20 | V.V. Mikheev (Omsk institute of water transport, Russia). Heat kernel expansion on Lie groups |
| 15.20 – 15.40 | V.E. Fomin (KFU, Russia). Curves with constant curvatures in a Hilbert space |
| 15.40 – 16.00 | A. Magazev (Omsk institute of water transport, Russia). Generating Function of Canonical Transformation on Lie Groups |
| 16.00 – 16.15 | D. Biserov (KFU, Russia). Matrix algorithm of construction of V-variables Fractals |
| 16.15 – 16.30 | A.Yu. Kuznetsova (KFU, Russia). On one class of nuclear C*- algebras |
| 16.30 – 16.45 | N.S. Perminov (KFU, Russia). Scattering problem in Finslerian Extension of Einstein Gravity |

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| 16.40 – 17.00 | <i>Coffee-break</i> |
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Session I: Chair V.L. Kauts (Astro Space Center of Lebedev Physical Institute of RAS, Russia)

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| 17.00 – 17.20 | Yu.A. Portnov (Institute of Problems in Mechanical Engineering RAS, Russia). Ускоренное расширение Вселенной в семимерном пространстве-времени при вращении барионной материи |
| 17.20 – 17.40 | V.A. Popov (KFU, Russia). Dark energy and dark matter unification via superfluid Chaplignin gas |
| 17.40 – 17.55 | A.A. Popov (KFU, Russia). Long throat of a wormhole created from vacuum fluctuations |
| 17.55 – 18.10 | K.N. Lipkin (MSU, Russia). Decreasing the dark energy density in the theory of gravity with a scalar field in Weyl-Cartan spacetime |
| 18.10 – 18.25 | V.M. Koryukin (Mari State University, Russia). On the role of Lobachevskij–Chernikov potential in the gravitation theory |
| 18.25 – 18.40 | S. Kozyrev (Scientific center gravity wave studies "Dulkyn", Kazan). Composite stars and wormholes in Einstein and Jordan-Brans-Dicke theories |
| 18.40 – 18.55 | U.N. Zakirov (KFU, Russia). On Rogozhin model of jet potential as a basis for generalization of the 5D metrics of the Gross-Perry and Kerr types |
| 18.55 – 19.10 | P. Chumarov (KFU, Russia). Wormholes in 6D Kaluza-Klein theory |

Saturday, November 6

Plenary session: Chair M.O. Katanaev (Steklov mathematical institute, Russia)

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| 9.00 – 9.30 | V.D. Andreev (Kiev, Ukraine). Эффекты напряженно-деформированного состояния и кинематики движения 4-мерной среды в модели инверсно-сопряженных пространств |
| 9.30 – 10.00 | A.B. Balakin (KFU, Russia). Nonminimal field theory |
| 10.00 – 10.30 | S.V. Sushkov (KFU, Russia). Cosmological models with nonminimal derivative coupling |

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| 10.30 – 11.00 | <i>Coffee-break</i> |
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Plenary session: Chair A.B. Balakin (KFU, Russia)

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| 11.00 – 11.30 | N.P. Konopleva (NPP VNIIEМ, Russia). Gauge fields and gravity |
| 11.30 – 12.00 | N.R. Khusnutdinov (KFU, Russia). Self-interaction in a wormhole spacetime |
| 12.00 – 12.30 | A.V. Aminova (KFU, Russia). Petrov group invariant approach in supergravity: Program and some results |

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| 13.00 | Informal round table “Geometry and Physics: Unified Trends and Perspectives” |
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Closing