

PROGRAM

Monday, November 1

8.00 – 20.00 Registration.

Excursions:

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

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

Tuesday, November 2

8.00 – 10.00 Registration.

Opening Ceremony

9.30 – 10.00 Opening the A. Z. Petrov Memorial Board.

- 10.00 – 11.45
- **I.R. Gafurov, Rector of Kazan University.** Welcome.
 - **A.V. Aminova.** A. Z. Petrov: Life and activity.
 - Greetings:
 - Prof. **G.S. Bisnovatyi-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 *Lunch.*

Plenary Session: Chair A.V. Aminova.

15.00 – 15.30* **D.R. Brill.** The beginnings of black-hole horizons.

15.30 – 16.00 **V.N. Lukash.** Pillars of physical cosmology.

16.00 – 16.30 **M.V. Sazhin.** Investigation of cosmological perturbation by astronomical methods.

16.30 – 17.00 *Coffee-break.*

- 30 min = 25 min (talk) + 5 min (discussion).

Plenary Session: Chair D.R. Brill.

- 17.00 – 17.30 **J.P.S. Lemos.** Black holes and quasi black holes: properties, similarities and differences.
- 17.30 – 18.00 **I.G. Dymnikova.** Petrov's Classification and Vacuum Dark Fluid.
- 18.00 – 18.30 **Kim Sung-Won.** Cosmological Perturbation and Dark Energy.
- 18.30 – 19.00 **V.A. Berezin.** Classical analog of quantum Schwarzschild black hole and mystery of "log 3".
- 19.00 *Welcome party.*

Wednesday, November 3

Plenary session: Chair V.N. Lukash.

- 9.00 – 9.30 **G.S. Bisnovatyi-Kogan.** Neutrino in the Universe.
- 9.30 – 10.00 **Kim Young Suh.** Internal Space-time Symmetries according to Einstein, Wigner, Dirac, and Feynman.
- 10.00 – 10.30 **A.A. Grib.** Active galaxy cores as elementary particle supercolliders.
- 10.30 – 11.00 **M. Bordag.** On the vacuum interaction of two cosmic strings.
- 11.00 – 11.30 *Coffee-break.*

Plenary session: Chair R. Kerner.

- 11.30 – 12.30 **Reminiscences about A.Z. Petrov**
- **N.N. Neprimerov.** Gravity with spin: The collaborated work with A.Z. Petrov.
 - **E.A. Tagirov.** My reminiscences about A.Z. Petrov.
 - **N. Konopleva.** TBA.
- 12.30 – 13.00 **A.Ya. Burinsky.** Algebraically Special Kerr-Schild Fields, the Kerr Theorem and the Exact Kerr-Schild Solutions.
- 13.00 – 13.30 **D.V. Galtsov.** Seeing invisible.
- 13.30 – 15.00 *Lunch.*

Parallel sessions.

Session I: Chair S.V. Sushkov.

- 15.00 – 15.20* **Ahsan Zafar.** A study of the Riemann curvature tensor and Petrov classification in general relativity.
- 15.20 – 15.40 **Bali Raj.** Bianchi Type I Massive String Cosmological Model with Free Gravitational Field of Petrov Type I Degenerate.
- 15.40 – 16.00 **Pradhan Anirudh.** Anisotropic Bianchi Type-I

Massive String Cosmological Models in General Relativity.

16.00 – 16.20 **A.V. Toporensky.** Regular and chaotic regimes in FRW scalar field cosmology.

16.20 – 16.40 **Yu.V. Pavlov.** 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.

15.00 – 15.20 **A.A. Salimov.** Differential Geometry of Walker Manifolds.

15.20 – 15.40 **I.A. Gordeeva.** Riemannian–Cartan manifolds.

15.40 – 16.00 **A.V. Kuleshov.** Обобщенные связности на комплексе централизованных плоскостей в проективном пространстве (Generalized connections on a complex of centralized planes in projective space).

16.00 – 16.20 **V. Lukianov.** Связь уравнений Янга-Миллса с уравнениями Эйнштейна и Максвелла (Connection between Yang-Mills equations and Einstein and Maxwell equations).

16.20 – 16.40 **I.N. Shurnikov.** On a number of regions of projective space separated by N plates.

16.40 – 17.00 *Coffee-break.*

Session I: Chair N.R. Khusnutdinov.

17.00 – 17.20 **Nazari Borzoo.** Casimir apparatus in a gravitational field.

17.20 – 17.40 **V.V. Voytik.** The principle of common form invariance and its consequences.

17.40 – 18.00 **K. Andreev.** О спинорном формализме при четном n (On spinor formalism for even n).

18.00 – 18.20 **A.S. Galaev.** On the Einstein equation on Lorentzian manifolds admitting recurrent lightlike vector fields.

18.20 – 18.35 **Erico Tanaka.** Hamilton equations of general relativity.

18.35 – 18.50 **A.E. Zayats.** Classification of optical metrics in terms of Petrov types for non-minimal Einstein-Maxwell models.

18.50 – 19.05 **F.Sh. Zaripov.** A conformally invariant generalization of string theory to higher-dimensional objects: Hierarchy of coupling constants.

19.05 – 19.20 **T. Alpin.** Anomaly increasing of electric and magnetic fields as a dynamo-optical effect induced by gravitational radiation.

Session II: Chair G.A. Tolstikhina.

17.00 – 17.20 **P.I. Troshin.** On Measure Invariance for a 2-valued Transformation.

17.20 – 17.40 **K.V. Polyakova.** Обобщенный внешний

- дифференциал и его приложение.
- 17.40 – 18.00 **L.N. Romakina.** Черепичные разбиения гиперболической плоскости положительной кривизны, порожденные правильным n -контуром.
- 18.00 – 18.20 **V.M. Svirkin.** Спектр лапласиана простых групп Ли ранга один и два.
- 18.20 – 18.40 **Yu.I. Shevchenko.** Тензор кривизны-кручения обобщенной проективной связности на распределении.
- 18.40 – 19.00 **Yu.I. Ponomarenko.** Regular maps on two-dimensional surfaces.

Thursday, November 4

- 10.00 – 13.00 **Excursion:**
"Raifa monastery", from 10 am to 1 pm. (Raifa monastery in the vicinity of Kazan, about 40 km).

Plenary session: Chair A.M. Shelekhov.

- 15.00 – 15.30 **V.N. Berestovsky.** 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.** Generalization of the Wagner curvature tensor for nonholonomic manifolds of codimension 1 with a Finsler metric.
- 16.00 – 16.30 **G.A. Tolstikhina.** Bol transformation quasigroups and three-webs defined by them.

16.30 – 17.00 *Coffee-break.*

Plenary session: Chair V.N. Berestovsky.

- 17.00 – 17.30 **I.Kh. Sabitov.** Изометричные поверхности с общей средней кривизной и решение проблемы пар Бонне.
- 17.30 – 18.00 **A.M. Shelekhov.** Closed G-structure defined by three-webs.
- 18.00 – 18.30 **V.A. Igoshin.** Cartan-Shapiro-Petrov problem of geodesic modeling.
- 18.30 – 19.00 **V.V. Shurygin.** Lie jets and prolongations of geometric objects to second order tangent bundles.

19.00 *Banquet.*

Friday, November 5

Plenary session: Chair D.V. Galtsov.

- 9.00 – 9.30 **S.E. Stepanov.** Infinitesimal harmonic and isometric transformations and Ricci solitons.
- 9.30 – 10.00 **P. Kuusk.** Theories of cosmology: beyond the Concordance Model.
- 10.00 – 10.30 **R. Kerner.** New approximation methods in the two-body problem.
- 10.30 – 11.00 **R.F. Polischuk.** Типы Петрова и геометрия пространства-времени (Petrov types and spacetime geometry).

11.00 – 11.30 *Coffee-break.*

Plenary session: Chair V.A. Berezin.

- 11.30 – 12.00 **M.O. Katanaev.** Tube dislocations in gravity.
- 12.00 – 12.30 **E.A. Tagirov.** Quantum Mechanics in Curved Spaces from Schrodinger up to Nowadays.
- 12.30 – 13.00 **B. Khots.** Observer's Mathematics applications to the Number theory, Geometry, Analysis, Classical and Quantum Mechanics.
- 13.00 – 13.30 **A.N. Golubyatnikov.** Relativistic media with geometrical constraints.

13.30 – 15.00 *Lunch.*

Parallel sessions.

Session I: Chair A.A. Popov.

- 15.00 – 15.20 **E.A. Mena.** Solutions in Non-Commutative Quantum Cosmology.
- 15.20 – 15.40 **P.O. Kazinski.** Dependence of masses of particles of the Standard Model on a gravitational field.
- 15.40 – 16.00 **V.L. Kauts.** Annihilation of the dark matter near to gravitating objects.
- 16.00 – 16.20 **S.V. Pilipenko.** Internal structure of dark-matter halos.
- 16.20 – 16.40 **S. Pavluchenko.** The dynamics of the flat anisotropic models in the Lovelock gravity.

Session II: Chair S.V. Galaev.

- 15.00 – 15.20 **V.V. Mikheev.** Heat kernel expansion on Lie groups.
- 15.20 – 15.40 **V.E. Fomin.** Curves with constant curvatures in a Hilbert space.
- 15.40 – 16.00 **A. Magazev.** Generating Function of Canonical Transformation on Lie Groups.
- 16.00 – 16.20 **D. Biserov.** Matrix algorithm of construction of V-variables Fractals.
- 16.20 – 16.40 **N.S. Perminov.** Scattering problem in Finslerian Extension of Einstein Gravity.

16.40 – 17.00 *Coffee-break.*

Session I: Chair V.L. Kauts.

- 17.00 – 17.20 **Yu.A. Portnov.** Ускоренное расширение Вселенной в семимерном пространстве-времени при вращении барионной материи.
- 17.20 – 17.40 **L.I. Petrova.** Особенности уравнений теории поля.
- 17.40 – 17.55 **A.A. Popov.** Long throat of a wormhole created from vacuum fluctuations.
- 17.55 – 18.10 **K.N. Lipkin.** 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.** On the role of Lobachevskij–Chernikov potential in the gravitation theory.
- 18.25 – 18.40 **S. Kozyrev.** Composite stars and wormholes in Einstein and Jordan-Brans-Dicke theories.
- 18.40 – 18.55 **U.N. Zakirov.** 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.** Wormholes in 6D Kaluza-Klein theory.

<h2>Saturday, November 6</h2>

Plenary session: Chair M.O. Katanaev.

- 9.30 – 10.00 **V.D. Andreev.** Эффекты напряженно-деформированного состояния и кинематики движения 4-мерной среды в модели инверсно-сопряженных пространств.
- 10.00 – 10.30 **A.B. Balakin.** Nonminimal field theory.
- 10.30 – 11.00 **S.V. Sushkov.** Cosmological models with nonminimal derivative coupling.

11.00 – 11.30 *Coffee-break.*

Plenary session: Chair M.O. Katanaev.

- 11.30 – 12.00 **N.R. Khusnutdinov.** Self-interaction in a wormhole spacetime.
- 12.00 – 12.30 **A.V. Aminova.** Petrov group invariant approach in supergravity: Program and some results.

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

Closing.

ABSTRACTS