

# 10<sup>th</sup> ALEXANDER FRIEDMANN INTERNATIONAL SEMINAR ON GRAVITATION AND COSMOLOGY

24 June, Monday

8:00-9:30 **Registration** (room 458)

9:30-9:45 **Opening Plenary Session** (room 470)

Chairperson: **V. M. Mostepanenko**

9:45-10:15 **A. A. Starobinsky** (L. D. Landau Institute for Theoretical Physics, Russia)  
Inflation, pre-inflation and quantum gravity.

10:15-10:45 **X. P. H. Calmet** (University of Sussex, United Kingdom)  
Quantum gravitational corrections to cosmological and astrophysical processes.

10:45-11:15 **Coffee break**

**Plenary Session** (room 470)

Chairperson: **A. A. Starobinsky**

11:15-11:45 **A. A. Grib**, Yu. V. Pavlov (Herzen University, Institute for Problems in Mechanical Engineering, Russia)

50 years of calculation of the density of particles created in the early Friedmann Universe.

11:45-12:15 **U. Moschella** (University dell'Insubria, Italy)  
Topological effects in de Sitter QFT.

12:15-12:45 **S. D. Odintsov** (Institute of Space Sciences, Spain)  
Cosmology and modified gravity: An overview.

12:45-14:30 **Lunch**

**Section A** (room 470)

Chairperson: **U. Moschella**

14:30-14:50 **A. Urazalina** (Al-Farabi Kazakh National University, Kazakhstan)  
Phantom and ordinary solutions with scalar fields in GR with different potentials.

14:50-15:10 **K. A. Bronnikov, S. V. Bolokhov, M. V. Skvortsova** (Peoples Friendship University, Russia)

On possible semiclassical bounce inside the Schwarzschild black hole.

15:10-15:30 **I. Dymnikova** (A. F. Ioffe Physical Technical Institute, Russia)  
Regular black holes and solitons with de Sitter interiors.

15:30-15:50 **A. Parnachev** (Trinity College, Ireland)  
Black holes, phase shift and holography.

15:50-16:10 **B. E. Meierovich** (P. L. Kapitza Institute for Physical Problems, Russia)  
Black hole and dark matter: Phase equilibrium.

16:10-16:30 **Z. Nekouee, J. Sadeghi, M. Shokri** (University of Mazandaran, Iran)  
The Lagrangian of charged test particle in Horava-Lifshitz black hole and deformed phase space.

16:30-17:00 **Coffee break**

## **Section A** (room 470)

Chairperson: **K. A. Bronnikov**

17:00-17:20 **J. Ovalle** (Silesian University in Opava, Simon Bolivar University, Czech Republic, Venezuela)

Black holes and the meaning of gravitational decoupling.

17:20-17:40 **V. A. Prokopov**, S. O. Alexeev, B. N. Latosh, E. D. Emtsova (M. V. Lomonosov Moscow State University, Russia)

Observable properties of phenomenologically extended black hole model with charges.

17:40-18:00 **Yu. N. Eroshenko** (Institute for Nuclear Research, Russia)

Evolution of matter around primordial black hole at radiation-dominated epoch.

18:00-18:20 **A. Toporensky**, D. Muller, S. Mistra (Sternberg Astronomical Institute, Russia, Brazil, India)

On generality of Starobinsky inflation in Einstein and Jordan frames.

18:20-18:40 **A. Zinhailo** (Silesian University in Opava, Czech Republic)

Quasinormal modes of the four-dimensional black hole in Einstein-Weyl gravity.

19:00-21:00 **Reception**

## **Section B** (room 359)

Chairperson: **S. D. Odintsov**

14:30-14:50 **M. J. Guzman**, R. Ferraro (University of La Serena, Chile)

Degrees of freedom and Hamiltonian formalism for  $f(T)$  gravity.

14:50-15:10 **M. Hohmann** (University of Tartu, Estonia)

Hamiltonian formulation of teleparallel gravity.

15:10-15:30 **B. N. Latosh** (State University "Dubna", Russia)

Effective field theory application for Fab Four based scalar-tensor gravity.

15:30-15:50 **J. P. Mbeleck** (University of Douala, Cameroon)

Experimental tests of an improved 5D Kaluza-Klein theory.

15:50-16:10 R. R. Cuzinatto, C. A. M. de Melo, **L. G. Medeiros**, P. J. Pompeia (Universidade Federal do Rio Grande do Norte, Brazil)

Higher order theories of gravity and modified Starobinsky inflation model in the Palatini approach.

16:10-16:30 **A. Nikolaev**, S. D. Maharaj (University of KwaZulu-Natal, South Africa)

Embedding with Vaidya geometry.

16:30-17:00 **Coffee break**

## **Section B** (room 359)

Chairperson: **A. R. Cisterna Roa**

17:00-17:20 **S. Yu. Vernov**, A. Yu. Kamenshchik, E. O. Pozdeeva, A. A. Starobinsky, A. Tronconi, T. Vardanyan, G. Venturi (M. V. Lomonosov Moscow State University, Russia)

Static, spherically symmetric solutions in scalar-tensor gravity models.

17:20-17:40 R. R. Cuzinatto, L. G. Medeiros, **P. J. Pompeia** (Instituto Tecnológico de Aeronautica, Brazil)

Modified Starobinsky inflation: a higher order approach.

17:40-18:00 A. B. Arbuzov, **A. E. Pavlov** (Russian State Agrarian University, Russia)

Intrinsic time in geometrodynamics of closed manifolds.

18:00-18:20 **E. O. Pozdeeva** (M. V. Lomonosov Moscow State University, Russia)

Exact solutions in non-local Gauss-Bonnet gravity.

18:20-18:40 B. Mishra, **S. Tarai** (Birla Institute of Technology and Science, India)

Dynamics of Bianchi  $VI_h$  universe with bulk viscous fluid in modified gravity.

19:00-21:00 **Reception**

**25 June, Tuesday**

**Plenary Session** (room 470)

Chairperson: **C. Laemmerzahl**

9:00-9.30 **A. Popov** (Kazan Federal University, Russia)

Vacuum polarization of a quantized scalar field in the thermal state in a long throat.

9:30-10.00 **I. L. Shapiro** (Universidade Federal de Juiz de Fora, Brazil)

Effective action induced by anomaly: new results.

10:00-10.30 **V. P. Neznamov**, M. V. Gorbatenko (Russian Federal Nuclear Center, Russia)

Quantum mechanics of stationary states of particles in external singular spherically and axially symmetric gravitational fields.

10:30-11:00 **Coffee break**

**Plenary Session** (room 470)

Chairperson: **I. L. Shapiro**

11:00-11.30 **C. Laemmerzahl** (University of Bremen, Germany)

Signatures of black holes star motion, accretion disks, and shadows.

11:30-12.00 **D. G. Yakovlev** (A. F. Ioffe Physical Technical Institute, Russia)

Weak interaction and nonequilibrium neutron stars.

12:00-12.30 **H. A. Harutyunian**, A. M. Grigoryan (V. Ambartsumian Byurakan Astrophysical Observatory, Armenia)

On the observed growth of the astronomical unit.

12:30-13.00 **Qiuhe Peng** (Nanjing University, China)

Implications for discovery of strong radial magnetic field at the Galactic center.

13:00-14:30 **Lunch**

**Section A** (room 470)

Chairperson: **M. Yu. Piotrovich**

14:30-14.50 **S. O. Alexeyev** (Sternberg Astronomical Institute, Russia)

Extended gravity at galaxy cluster's scales.

14:50-15:10 **A. V. Astashenok** (I. Kant Baltic Federal University, Russia)

Cosmological models with jump discontinuities.

15:10-15:30 E. Kopteva, **I. Bormotova**, M. Churilova, Z. Stuchlik (Silesian University in Opava, Ukraine, Czech Republic)

Accelerated expansion of the Universe from the perspective of inhomogeneous cosmology.

15:30-15:50 **K. Boshkayev**, A. Alimgozha, Zh. Kalymova, B. Zhami (Al-Farabi Kazakh

National University, Kazakhstan)

Hot rotating white dwarfs with different nuclear composition.

15:50-16:10 **Yu. V. Dumin** (Sternberg Astronomical Institute, Russia)

A unified model of dark energy based on the quantum-mechanical uncertainty relation.

16:10-16:30 **A. Egorov** (P. N. Lebedev Physical Institute, Russia)

Dark matter searches by means of the GAMMA-400 gamma-ray telescope.

16:30-17:00 **Coffee break**

**Section A** (room 470)

Chairperson: **K. Boshkayev**

17:00-17:20 H. A. Harutyunian, **A. M. Grigoryan**, A. M. Khasawneh (V. Ambartsumian Byurakan Astrophysical Observatory, Armenia)

On the correlation between luminosities and redshifts of cluster galaxies.

17:20-17:40 **M. Yu. Piotrovich**, V. L. Afanasiev, S. D. Buliga, T. M. Natsvlishvili (Pulkovo Observatory, Russia)

Determination of supermassive black hole spins in active galactic nuclei.

17:40-18:00 **B. Aliyev** (V. I. Surikov Moscow State Art Institute, Russia)

The new physics in 5D theory.

18:00-18:20 **A. A. Kirillov**, E. P. Savelova (Bauman Moscow State Technical University, Russia)

Wormhole as a possible accelerator of high-energy cosmic-ray particles.

18:20-18:40 **S. Komarov**, A. Gorbatsievich (Belarusian State University, Belarus)

Method of reconstruction of relative motion of a binary star in the vicinity of black hole by its redshift.

18:40-19:00 **R. I. P. Sedmik**, M. Pitschmann, H. Abele (Atominstut TU Wien, Austria)

Parallel plate force metrology as a tool to probe dark sector interactions.

19:00-19:20 **I. A. Babenko** (Peoples Friendship University, Russia)

Astrophysical objects magnetic fields in three physical concepts.

**Section B** (room 359)

Chairperson: **M. L. Fil'chenkov**

14:30-14:50 **M. A. Skugoreva**, M. Sami and N. Jaman (Kazan Federal University, Russia)

Emergence of cosmological scaling behavior in asymptotic regime.

14:50-15:10 **T. P. Shestakova** (South Federal University, Russia)

On a probable cosmological scenario in the extended phase space approach to quantization of gravity.

15:10-15:30 **A. B. Arbuzov** (Joint Institute for Nuclear Research, Russia)

Conformally coupled general relativity.

15:30-15:50 **A. Beesham** (University of Zululand, South Africa)

First observational test of General Relativity.

15:50-16:10 **N. Khusnutdinov** (Universidade Federal do ABC, Brazil)

The self-force for particle in plane wave space-time.

16:10-16:30 **A. N. Buljuk** (Kotelnikov Institute of Radioengineering and Electronics, Russia)

Theory of gravity with a quadratic connection of the gravitational field tensor with the metric tensor: A new approach to the description of energy of gravitational field.

16:30-17:00 **Coffee break**

## **Section B** (room 359)

Chairperson: **A. Beesham**

17:00-17:20 **G. Esposito** (INFN, Sezione di Napoli, Italy)

How to realize trapped surfaces in Friedmann models?

17:20-17:40 **M. L. Fil'chenkov**, Yu. P. Laptev (Peoples Friendship University, Russia)

On gravitational radiation of microsystems.

17:40-18:00 **M. Moumni**, M. Falek (University of Biskra, Algeria)

Minimal length corrections to FLRW solutions.

18:00-18:20 E. A. Isanaev, **P. E. Kashargin**, S. V. Sushkov (Kazan Federal University, Russia)

Collapsing wormhole in general relativity with a dustlike matter.

18:20-18:40 **B. Saha** (Joint Institute for Nuclear Research, Russia)

Interacting self-consistent system of spinor and gravitational fields.

18:40-19:00 **B. P. Brassel** (University of KwaZulu-Natal, South Africa)

Collapsing radiation shells in Einstein-Gauss-Bonnet gravity.

19:00-19:20 **A. Golovnev** (St.Petersburg State University)

Cosmological perturbations in modified teleparallel theories of gravity.

## **26 June, Wednesday**

### **Plenary Session** (room 470)

Chairperson: **V. N. Rudenko**

9:00-9:30 **K. A. Bronnikov** (VNIIMS, Russia)

Potentially observable cylindrical wormholes without exotic matter.

9:30-10:00 **M. Maia** (Universidade de Brasilia, Brazil)

The impact of the Higgs on Einstein's gravity.

10:00-10:30 **V. P. Frolov** (University of Alberta, Canada)

Integrability and separability in black-hole spacetime.

10:30-11:00 **Coffee break**

### **Plenary Session** (room 470)

Chairperson: **V. P. Frolov**

11:00-11:30 **S. V. Ketov** (Tokyo Metropolitan University and Kavli IPMU, Japan)

Inflation, dark energy and dark matter in supergravity.

11:30-12:00 **V. M. Mostepanenko** (Pulkovo Observatory, Peter the Great St.Petersburg Polytechnic University, Russia)

Some remarks on axion dark matter, dark energy and energy of the quantum vacuum.

12:00-12:30 **Pengshun Luo**, Jihua Ding, Xiaofang Ren, Rui Luo, Jianbo Wang (Huazhong University of Science and Technology, China)

Test of spin-dependent exotic interactions at the micrometer range.

12:30-13:00 **V. N. Rudenko** (Sternberg Astronomical Institute, Russia)

Current status of the GW experiment and Russian participation.

13:00-14:30 **Lunch**

## **Section A** (room 470)

Chairperson: **S. V. Sushkov**

14:30-14:50 E. I. Kugushev, **T. V. Salnikova**, S. Ya. Stepanov (M. V. Lomonosov Moscow State University, Russia)

Possible models of the planetary systems formations.

14:50-15:10 **A. A. Sheykin**, S. A. Paston (St.Petersburg State University, Russia)

Polyakov-like approach to the modified gravity theories.

15:10-15:30 **S. G. Rubin** (National Research Nuclear University, Russia)

Evolution of subspaces from high to low energies.

15:30-15:50 **A. R. Cisterna Roa** (Universidad Central de Chile, Chile)

Homogenous anti de-Sitter black strings in General Relativity and Lovelock Gravity.

15:50-16:10 **T. Vardanyan**, A. Yu. Kamenshchik (University of Bologna, Italy)

Exact solutions of the Einstein equations for an infinite slab with constant energy density.

16:10-16:30 A. A. Andrianov, A. Starodubtsev, **Y. R. A. A. Elmahalawy** (St.Petersburg State University, Russia)

Quantization of dust shell model within 2+1 dimensional gravity and its generalization.

16:30-16:50 **V. V. Kassandrov**, N. V. Markova (Peoples Friendship University, Russia)

Mass spectrum in a relativistic generalization of the Schrodinger-Newton-Penrose model for the wave function reduction.

16:50-17:20 **Coffee break**

## **Section B** (room 359)

Chairperson **J. Ovalle**

14:30-14:50 **S. D. Maharaj** (University of KwaZulu-Natal, South Africa)

Models for bounded radiating structures.

14:50-15:10 **M. Maia** (Universidade de Brasilia, Brazil)

The gravitational compass.

15:10-15:30 A. A. Grib, **Yu. V. Pavlov** (Herzen University, Institute for Problems in Mechanical Engineering, Russia)

Particle properties outside the static limit in the rotating coordinate system.

15:30-15:50 **E. P. Savelova**, A. A. Kirillov (Bauman Moscow State Technical University, Russia)

Virtual wormholes and dynamical Pauli-Villars regularization.

15:50-16:10 **L. I. Petrova** (M. V. Lomonosov Moscow State University, Russia)

Correspondence between equations of field theory and the evolutionary relation of mathematical physics equations: Interpretation of Einstein's equations.

16:10-16:30 **K. G. Zloshchastiev** (Durban University of Technology, South Africa)

Logarithmic superfluid theory of physical vacuum: Resolving the cosmological singularity problem and photon dispersion relations.

16:30-16:50 **V. N. Strokov**, Sh. Khlghatyan (P. N. Lebedev Physical Institute, Russia)

The orbital lense—Thirring precession in a strong field.

16:50-17:20 **Coffee break**

**17:30-19:00 Poster Session**

- 1. N. Arakelyan** (P. N. Lebedev Physical Institute, Russia)  
Impact of the accretion of Sagittarius dwarf on the distribution of Milky Way's globular clusters.
- 2. R. S. Bogadi** (Durban University of Technology, South Africa)  
Relativistic thermodynamics of radiating stars.
- 3. L. Erokhin** (NBK LLC, Russia)  
To the question on accelerated universe expansion.
- 4. E. T. Akhmedov, P. A. Anempodistov, I. D. Ivanova** (Higher School of Economics, Russia)  
Corrections to the Aretakis type behaviour of the metric due to an infalling particle.
- 5. A. P. Lelyakov** (V. I. Vernadsky Crimean Federal University, Russia)  
Influence of the gravitational field of a null string domain that radially changes its size on the dynamics of a test null string.
- 6. A. V. Aminova, M. Kh. Lyulinsky** (Kazan Federal University, Russia)  
Particle's movement in the de'Sitter superspace.
- 7. A. V. Nesterenok** (A. F. Ioffe Physical Technical Institute, Russia)  
Modelling of non-dissociative shock waves in dense interstellar clouds.
- 8. L. V. Grunskaya, V. V. Isakevich, D. V. Isakevich, O. V. Makovetskaya-Abramova** (Stoletov Vladimir State University, St.Petersburg State University of Economics, Russia)  
Anomalous behavior of the terrestrial electric field intensity at multiple frequencies of relativistic binary stellar systems.
- 9. N. N. Gorobey, A. S. Lukyanenko, A. Shavrin** (Peter the Great St.Petersburg Polytechnic University, Russia)  
Ground state and quantization of the energy of space in an anisotropic model of the universe.
- 10. T. R. Stepanova, E. N. Viahhi** (Peter the Great St.Petersburg Polytechnic University, Russia)  
Collective effects of gravitational interaction.
- 11. X. Ren, R. Luo, J. Wang, X. Jia, P. Luo** (Huazhong University of Science and Technology, China)  
Test of exotic monopole-dipole interaction at micrometer range.
- 12. A. S. Kuraptsev** (Peter the Great St.Petersburg Polytechnic University, Russia)  
Influence of a metallic surface on the spectrum of eigenstates of dense polyatomic clusters.
- 13. M.A. Misyura** (St.Petersburg State University, Russia)  
Gravitational radiation from collision of particles.
- 14. I. V. Fomin, V. I. Pustovoit, V. O. Gladyshev, V. S. Gorelik, V. L. Kauts, A. V. Kayutenko, A. N. Morozov, E. A. Sharandin, T. M. Gladysheva, D. I. Portnov, A. D. Strunin** (Bauman Moscow State Technical University, Russia)  
High-frequency gravitational waves generation in modified theories of gravitation and electromagnetic-gravitational wave conversion in laboratory nonlinear optical media.
- 15. U. Ualikhanova** (University of Tartu, Estonia)  
Post-Newtonian limit of extended teleparallel theories of gravity.
- 16. F. Zaripov** (Kazan Federal University, Russia)  
Oscillatory solutions in cosmological models and in a centrally symmetric space in a modified theory of gravity. Estimated observational effects.

## 27 June, Thursday

### Plenary Session (room 470)

Chairperson: **D. Konkowski**

9:00-9:30 **A. Burinskii** (Nuclear Safety Institute, Russia)

Unification gravity with quantum theory: bag-like source of the Kerr-Newman spinning particle and anomalous magnetic moment of electron.

9:30-10:00 **M. S. Volkov** (Universite de Tours, France)

New theories with massive gravitons and new Horndeski-type theories, inflation and quantum gravity.

10:00-10:30 **A. D. Dolgov** (Novosibirsk State University, Russia)

Contemporary black holes from the early Universe.

10:30-11:00 **Coffee break**

### Plenary Session (room 470)

Chairperson: **A. D. Dolgov**

11:00-11:30 **D. Konkowski** (U. S. Naval Academy, USA)

Resolution of singularities in relativistic spacetimes.

11:30-12:00 **V. D. Ivashchuk**, A. A. Kobtsev (VNIIMS, Russia)

Stable exponential cosmological solutions with two factor spaces in the Einstein-Gauss-Bonnet model with a Lambda term.

12:00-12:30 **C. Romero** (Universidade Federal da Paraiba, Brazil)

A new approach to Weyl unified field theory.

12:30-13:00 **S. V. Sushkov** (Kazan Federal University, Russia)

Cosmological perturbations during the kinetic inflation in the Horndeski theory.

13:00-14:30 **Lunch**

### Section A (room 470)

Chairperson: **M. Maia**

14:30-14:50 **P. Kuusk** (University of Tartu, Estonia)

Scalar fields in generalized theories of gravity.

14:50-15:10 **D. A. Litvinov**, S. V. Pilipenko (Sternberg Astronomical Institute, Russia)

Novel aspects of probing the gravitational time dilation effect to test the Einstein equivalence principle.

15:10-15:30 A. N. Golubiatnikov, **D. B. Lyuboshits** (M. V. Lomonosov Moscow State University, Russia)

On the inhomogeneous annihilation stage of the Universe expansion.

15:30-18:30 **Excursion**

19:00-22.00 **Conference Dinner**

**Section B** (room 359)

Chairperson: **M. S. Volkov**

14:30-14:50 **M. Sharif** (University of Punjab, Pakistan)

Dynamics of scalar shell for black holes.

14:50-15:10 **P. V. Tretyakov**, A. Toporensky (Joint Institute for Nuclear Research, Russia)

On spin connection and cosmological perturbations in teleparallel gravity.

15:10-15:30 O. I. Chashchina, A. Sen, **Z. K. Silagadze** (Budker Institute of Nuclear Physics, Russia)

Planck-scale modification of classical mechanics.

15:30-18:30 **Excursion**

19:00-22.00 **Conference Dinner**

**28 June, Friday**

**Plenary Session** (room 470)

Chairperson: **D. V. Gal'tsov**

9:00-9:30 **O. B. Zaslavskii** (V.N. Karazin National University, Ukraine)

Super-Penrose process.

9:30-10:00 **J. C. Fabris** (Universidade Federal do Espirito Santo, Brazil)

Viscous models and the dark sector of the universe

10:00-10:30 **A. V. Minkevich** (Belarusian State University)

Gravitation interaction in astrophysics in Riemann-Cartan space-time.

10:30-11:00 **Coffee break**

**Plenary Session** (room 470)

Chairperson: **A. V. Minkevich**

11:00-11:30 **D. V. Gal'tsov** (M. V. Lomonosov Moscow State University, Russia)

Disformal dualities and nature of singularities in scalar-tensor gravity.

11:30-12:00 **A. Yu. Kamenshchik**, A. A. Starobinsky, A. Tronconi, T. Vardanyan, G. Venturi (University of Bologna, Italy, L. D. Landau Institute for Theoretical Physics, Russia)

Pauli–Zeldovich cancellation of the vacuum energy divergences, auxiliary fields and supersymmetry.

12:00-12:30 **V. A. Berezin** (Institute Institute for Nuclear Research, Russia)

Double layer in the higher derivative gravity theories.

12:30-13:00 V. F. Panov, **O. V. Sandakova**, E. V. Kuvshinova, M. R. Cheremnyh (Perm State University, Russia)

Cosmology with rotation in Bianchi's models.

13:00-14:30 **Lunch**

**Section A** (room 470)

Chairperson: **V. A. Berezin**

14:30-14:50 **V. Vertogradov** (Herzen State Pedagogical University, Russia)

The diagonalization of generalized Vaidya spacetime.

14:50-15:10 **E. E. Kholupenko** (A. F. Ioffe Physical Technical Institute, Russia)

On the possible lost anisotropy of the Unruh radiation.

15:10-15:30 **A. S. Lukyanenko** (Peter the Great St.Petersburg Polytechnic University, Russia)

A "stationary" Schroedinger equation in quantum cosmology.

15:30-15:50 **C. Parmeggiani** (University of Milano-Bicocca, Italy)

Quantum fields and gravity. Expanding space-times.

15:50-16:10 **A. Starodubtsev** (St.Petersburg State University, Russia)

Gravity-induced deformation of propagators in quantum field theory.

16:10-16:30 **L. M. Hadad** (The Open University of Israel, Israel)

Non-Cauchy surface foliations and their expected connection to quantum gravity theories.

16:30-17:00 **Coffee break**

**Section A** (room 470)

Chairperson: **C. Parmeggiani**

17:00-17:20 **R. H. Saibatalov** (A. A. Friedmann Laboratory for Theoretical Physics, Russia)

Nonrotating reference frame for the Gödel and Kerr metrics.

17:20-17:40 **V. Dzhunushaliev**, V. Folomeev, B. Kleihaus, J. Kunz (Al-Farabi Kazakh National University, Kazakhstan)

Thin-shell toroidal T2-wormhole.

17:40-17:50 **Closure** (room 470)

**Section B** (room 359)

Chairperson: **Yu. V. Pavlov**

14:30-14:50 **E. V. Arbuzova** (State University "Dubna", Russia)

Early universe in modified gravity.

14:50-15:10 **S. Alexandrov** (Universite de Montpellier, France)

Bigravity with single graviton.

15:10-15:30 D. Yu. Tsipenyuk, **W. B. Belayev** (A. M. Prokhorov General Physics Institute, Center for Relativity and Astrophysics, Russia)

Bubble structures in microphysical objects in 5-D extended space model.

15:30-15:50 **E. Babichev** (Laboratoire de Physique Theorique d'Orsay, France)

Cosmological instability of scalar-Gauss-Bonnet theories exhibiting scalarization.

15:50-16:10 **V. Dzhunushaliev**, G. K. Nurtayeva, A. A. Serikbolova (Al-Farabi Kazakh National University, Kazakhstan)

Domain walls and branes in multidimensional  $\alpha R^n$  gravities.

16:10-16:30 **E. D. Emtsova**, A. N. Petrov, A. V. Toporensky (Sternberg Astronomical Institute, Russia)

On conservation laws in teleparallel gravity.

16:30-17:00 **Coffee break**

**Section B** (room 359)

Chairperson: **A. S. Lukyanenko**

17:00-17:20 **T. Prokopec** (Utrecht University, Netherlands)

The role of Weyl symmetry in high energy physics.

17:20-17:40 **A. A. Chernitskii** (St. Petersburg State Chemical Pharmaceutical University, Russia)

Fundamental interactions and quantum behaviour in unified field theory.

18:40-18:50 **Closure** (room 470)

## **4<sup>th</sup> SYMPOSIUM ON THE CASIMIR EFFECT**

**24 June, Monday**

11:30-13:00 **Registration** (room 458)

13:00-14:30 **Lunch**

**Opening Session**

(room 452)

Chairperson: **G. L. Klimchitskaya**

14:30-15:00 **U. Mohideen** (University of California, USA)

New long range precision Casimir force measurements with insitu elimination of electrostatic effects.

15:00-15:30 **R. S. Decca** (Indiana University-Purdue University Indianapolis, USA)

Old experiments and a new proposal: Status of Casimir physics at IUPUI.

15:30-16:00 **Ho Bun Chan** (Hong Kong University of Science and Technology, Hong Kong)

Strong geometry dependence of Casimir forces between two rectangular gratings.

16:00-16:30 **G. Palasantzas**, F. Tajik, Z. Babamahdi, V. B. Svetovoy (University of Groningen, Netherlands)

Casimir actuation between real materials towards chaos.

16:30-17:00 **Coffee break**

Chairperson: **U. Mohideen**

17:00-17:20 **G. L. Klimchitskaya**, V. M. Mostepanenko (Pulkovo Observatory, Peter the Great St. Petersburg Polytechnic University, Russia)

Recent measurements of the Casimir force: Comparison between experiment and theory.

17:20-17:40 J. R. Rodrigues, A. Gusso, **F. S. S. Rosa**, V. R. Almeida (Universidade Federal do

Rio de Janeiro, Brazil)

Rigorous analysis of Casimir and van der Waals forces on a silicon nanooptomechanical device actuated by optical forces.

17:40-18:00 **F. Pinto** (Izmir University of Economics, Turkey)

The Hunklinger-Geisselman-Arnold-Dransfeld experiments: History, scientific context, and significance.

18:00-18:20 **I. Fialkovskiy**, N. Khusnutdinov (University of Ariel, Israel)

Casimir interaction and optical properties of semimetals.

19:00-21:00 **Reception**

## 25 June, Tuesday

(room 452)

Chairperson: **C. Farina**

9:00-9:30 **M. Antezza** (Universite de Montpellier, France)

Giant Casimir torque between rotated gratings and the  $\theta = 0$  anomaly.

9:30-10:00 **G. V. Dedkov**, A. A. Kyasov (H. M. Berbekov Kabardino-Balkarian State University, Russia)

Dynamically and thermally nonequilibrium fluctuation-electromagnetic interactions: Recent results and trends.

10:00-10:30 **C. Villarreal**, S. Caballero (Universidad Nacional Autonoma de Mexico, Mexico)

Casimir forces between high-Tc superconductors.

10:30-11:00 **Coffee break**

Chairperson: **V. M. Mostepanenko**

11:00-11:30 **M. Bordag** (Leipzig University, Germany)

Casimir effect and entropy.

11:30-12:00 **N. Khusnutdinov** (Universidade Federal do ABC, Brazil)

The Casimir and Casimir-Polder effects for layered planar structures.

12:00-12:30 **G. L. Klimchitskaya** (Pulkovo Observatory, Peter the Great St.Petersburg Polytechnic University, Russia)

The Casimir-Polder interaction of an atom and real graphene sheet: Verification of the Nernst heat theorem.

12:30-13:00 **A. I. Volokitin** (Samara State Technical University, Russia)

Fluctuation-induced electromagnetic phenomena under dynamic and thermal nonequilibrium conditions.

13:00-14:30 **Lunch**

Chairperson: **L. Woods**

14:30-14:50 **F. Intravaia** (Humboldt-Universitaet zu Berlin, Germany)

Frictional dispersion forces.

14:50-15:10 E. N. Velichko, G. L. Klimchitskaya, **E. K. Nepomnyashchaya** (Peter the Great St.Petersburg Polytechnic University, Pulkovo Observatory, Russia)

The Casimir repulsion through a water-based magnetic fluid.

15:10-15:30 **Bing Miao**, D. S. Dean, R. Podgornik (University of Chinese Academy of Sciences, China)

Casimir forces in Ising and Brazovskii fluctuation media within a Gaussian model.

15:30-15:50 C. C. Korikov, **V. M. Mostepanenko** (Peter the Great St.Petersburg Polytechnic University, Pulkovo Observatory, Russia)

Nernst heat theorem for the Casimir-Polder interaction between a magnetizable atom and ferromagnetic dielectric plate.

15:50-16:10 Yu. V. Grats, **P. Spirin** (M. V. Lomonosov Moscow State University, Russia)  
Vacuum polarization in the background of conical singularity.

16:10-16:30 E. N. Velichko, **M. A. Baranov**, V. M. Mostepanenko (Peter the Great St.Petersburg Polytechnic University, Pulkovo Observatory, Russia)

Change of sign in the Casimir free energy of peptide films deposited on a dielectric substrate.

16:30-17:00 **Coffee break**

Chairperson: **M. Bordag**

17:00-17:20 **I. Cervero Pelaez**, J. M. Munoz-Castaneda, C. Romaniega (Universidad de Zaragoza, Spain)

Casimir Energy of concentric delta-delta prime spheres.

17:20-17:40 **D. Fermi** (Universita Degli Studi di Milano, Italy)

Scalar Casimir effect for delta-type potentials.

17:40-18:00 **I. Pirozhenko** (Joint Institute for Nuclear Research, Russia)

On finite temperature Casimir effect for Dirac lattices.

18:00-18:20 **Yu. M. Pismak** (St.Petersburg State University, Russia)

Casimir effect in models of interaction of quantum electromagnetic fields with two-dimensional materials.

18:20-18:40 **M. Karim** (St. John Fisher College, USA)

Auto-stabilized electron.

**26 June, Wednesday**

(room 452)

Chairperson: **C. Villarreal**

9:00-9:30 **V. P. Frolov** (University of Alberta, Canada)

Vacuum polarization effect in a ghost free theory.

9:30-10:00 **V. N. Marachevsky** (St.Petersburg State University, Russia)

The Casimir effect for materials with Chern-Simons surface layers.

10:00-10:30 **D. Vassilevich** (Universidade Federal do ABC, Brazil)

Quest for Casimir repulsion between Chern-Simons surfaces.

10:30-11:00 **Coffee break**

Chairperson: **R. Decca**

11:00-11:30 **R. I. P. Sedmik**, H. Abele (Atominstytut TU Wien, Austria)

Prospects on measuring quantum vacuum forces between parallel plates.

11:30-12:00 **V. Svetovoy**, G. Palasantzas (University of Groningen, Netherlands)

A new method to measure the Casimir forces at short distances.

12:00-12:30 **L. B. Boinovich**, K. A. Emelyanenko, A. M. Emelyanenko (A. N. Frumkin Institute

of Physical Chemistry and Electrochemistry, Russia)

Van der Waals forces in thin liquid interlayers: Impact on the properties and stability of wetting and free films.

12:30-13:00 **L. M. Woods** (University of South Florida, USA)

Casimir interactions in novel materials.

13:00-14:30 **Lunch**

Chairperson: **D. M. Gitman**

14:30-14:50 **N. R. Larin**, V. V. Dubov, S. P. Roshchupkin (Peter the Great St.Petersburg Polytechnic University, Russia)

Resonant production of electron-positron pairs by a hard gamma-ray on a nucleus in an external electromagnetic field.

14:50-15:10 **N. V. Larionov** (Peter the Great St.Petersburg Polytechnic University, Russia)

Multiple scattering of light in a cold atomic cloud placed into the constant homogeneous electric or magnetic field.

15:10-15:30 **A. A. Pustyntsev**, V. V. Dubov, S. P. Roshchupkin (Peter the Great St.Petersburg Polytechnic University, Russia)

Resonant Breit-Wheeler process in an external electromagnetic field.

15:30-15:50 **D. V. Doroshenko**, V. V. Dubov, S. P. Roshchupkin (Peter the Great St.Petersburg Polytechnic University, Russia)

Resonant annihilation and production of high-energy electron-positron pairs in an external electromagnetic field.

15:50-16:10 **A. V. Dubov**, V. V. Dubov, S. P. Roshchupkin (Peter the Great St.Petersburg Polytechnic University, Russia)

Resonant emission of hard gamma-quanta at scattering of ultrarelativistic electrons by a nucleus in the presence of the external electromagnetic field.

16:10-16:30 **I. V. Safonov**, N. V. Larionov (Peter the Great St.Petersburg Polytechnic University, Russia)

Nanolaser under condition of phase synchronization.

16:30-16:50 **S. A. Smolyanskii** (Saratov State University, Russia)

Kinetics of the vacuum electron-positron plasma in a strong electric field and problem of radiation.

16:50-17:20 **Coffee break**

17:20-18:30 **Poster Session**

**27 June, Thursday**

(room 452)

Chairperson: **C. Henkel**

9:00-9:30 **S. P. Gavrilov**, D. M. Gitman, A. A. Shishmarev (Herzen State Pedagogical University, Russia)

Vacuum mean values in the presence of weakly inhomogeneous critical potential steps.

9:30-10:00 **M. I. Eides** (B. P. Konstantinov St.Petersburg Nuclear Physics Institute, University of Kentucky, Russia, USA)

Hyperfine splitting in muonium: Theory meets experiment.

10:00-10:30 **E. G. Drukarev**, A. I. Mikhailov (B. P. Konstantinov St.Petersburg Nuclear Physics Institute, Russia)  
Quantum electrodynamics in the fields of complex nanostructure.

10:30-11:00 **Coffee break**

Chairperson: **G. Palasantzas**

11:00-11:30 **C. Henkel** (Universitaet Potsdam, Germany)

Thermally excited quasiparticles in metals, dispersion forces and heat transfer.

11:30-12:00 **P. A. Maia Neto** (Universidade Federal do Rio de Janeiro, Brazil)

Screening of the Casimir interaction across an electrolyte solution.

12:00-12:30 **R. Podgornik** (Institute of physics, Chinese Academy of Sciences, China)

Passive and driven secondary Casimir effect in hydrodynamics.

12:30-13:00 **T. Emig** (Universite Paris Sud, Universite Paris-Saclay, France)

Conformal field theory of Casimir forces.

13:00-14:30 **Lunch**

Chairperson: **A. I. Volokitin**

14:30-14:50 **Y. Muniz**, D. Szilard, W. J. M. Kort-Kamp, F. S. S. Rosa, C. Farina (Universidade Federal do Rio de Janeiro Brazil)

Two-photon spontaneous emission in a photonic cavity.

14:50-15:10 **J. M. Munoz Castaneda** (University of Valladolid, Spain)

On the quantum vacuum energy for 1D crystals.

15:30-18:30 **Excursion**

19:00-22:00 **Conference Dinner**

**28 June, Friday**

(room 452)

Chairperson: **I. Klich**

9:00-9:20 A.B. Arbuzov, **A. E. Pavlov** (Russian State Agrarian University, Russia)

Static Casimir condensates of massive fields in Friedmann Universe.

9:20-9:40 **F. Pinto** (Izmir University of Economics, Turkey)

Mixed electric-gravitational Casimir-Polder potentials.

9:40-10:00 **I. Klich** (University of Virginia, USA)

Quantum fluctuations as the mechanism for a spin jam in a frustrated system.

10:00-10:20 A. A. Saharian, **A. S. Kotanjyan**, A. A. Saharyan (Yerevan State University, Armenia)

Electromagnetic Casimir densities for planar boundaries in AdS spacetime.

10:30-11:00 **Coffee break**

Chairperson: **T. Emig**

11:00-11:20 **M. R. R. Good** (Nazarbayev University, Kazakhstan)

Planck-distributed, finite particle creation of Casimir light.

11:20-11:40 D. Szilard, W. J. M. Kort-Kamp, F. S. S. Rosa, F. A. Pinheiro, **C. Farina**  
(Universidade Federal do Rio de Janeiro, Brazil)

Hysteresis in the spontaneous emission rate.

11:40-12:00 **P. P. Abrantes**, D. Szilard, F. S. S. Rosa, C. Farina (Universidade Federal do Rio de Janeiro, Brazil)

Forster resonance energy transfer near a critical medium at percolation.

12:00-12:20 **P. Spirin** (M. V. Lomonosov Moscow State University, Russia)

Classical ultrarelativistic bremsstrahlung in higher dimensions.

12:20-12:40 **Closure**

13:00-14:30 **Lunch**