



QFT &  
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# PROGRAMME

of the  
International Conference

**QUANTUM FIELD THEORY AND GRAVITY**

*Tomsk State Pedagogical University*  
*August 1 - 7, 2016*  
*Tomsk, Russia*

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## **The main topics:**

Supersymmetric Field Theory, String/Brane Theory, Higher Spin Field Theory, Classical and Quantum Gravity, Cosmology, Field Theory and Mathematical Physics.

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**Tomsk State Pedagogical  
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1<sup>st</sup> August, MONDAY

**1<sup>st</sup> August, MONDAY**

***Registration 9:00 – 9:45***

***Opening of the Conference 9:45 – 10:00***

**Morning Session 10:00 – 13:00**

***Chairperson: I.L. Buchbinder***

**10:00 – 10:30 K. Stelle** (Imperial College, London, UK) Black Holes and Higher Derivative Gravity.

**10:35 – 11:05 A. Wipf** (Jena University, Germany) Supersymmetric flows for the Effective Action.

***11:05 – 11:20 Coffee break***

***Chairperson: K. Stelle***

**11:20 – 11:50 E. Ivanov** (Joint Institute for Nuclear Research, Dubna, Russia) Higher-order invariants in  $N=(1,0)$  and  $N=(1,1)$  SYM theories from harmonic superspace.

**11:55 – 12:25 E. Buchbinder** (University of Western Australia, Crawley, Australia) Towards Heterotic Standard Model on a Calabi-Yau Manifold: an Overview.

**12:30 – 13:00 M. Katanaev** (Steklov Mathematical Institute, Moscow, Russia) Chern-Simons term in the geometric theory of defects.

***13:00 – 15:00 Lunch***

**Afternoon Session 15:00 – 17:50**

*Chairperson: A. Wipf*

**15:00 – 15:30 S. Krivonos** (Joint Institute for Nuclear Research, Dubna, Russia) Minimal realization of 1-conformal Galilei algebra, Pais-Uhlenbeck oscillators and their deformation.

**15:35 – 16:05 A. Galajinsky** (Tomsk Polytechnic University, Russia) Near horizon black holes with NUT charges.

**16:10 – 16:40 I. Shapiro** (Federal University of Juiz de Fora, Brazil) Superrenormalizable models of quantum gravity.

*16:40 – 16:55 Coffee break*

*Chairperson: A. Galajinsky*

**16:55 – 17:15 S. Sidorov** (Joint Institute for Nuclear Research, Dubna, Russia)  $SU(2|1)$  supersymmetric mechanics and long multiplets.

**17:20 – 17:50 R. Bonezzi** (University of Mons, Belgium) Generalized Frobenius Chern-Simons gauge theory.

**19:00** *Welcome Party*

**2<sup>nd</sup> August, TUESDAY**

**Morning Session 9:00 – 13:00**

*Chairperson: S. Krivonos*

- 9:00 – 9:30** **Yu. Zinoviev** (Institute for High Energy Physics, Protvino, Russia) On the Fradkin-Vasiliev formalism in three dimensions.
- 9:35 – 10:05** **N. Boulanger** (University of Mons, Belgium) Issues on higher spin theory and duality.
- 10:10 – 10:40** **S. Fedoruk** (Joint Institute for Nuclear Research, Dubna, Russia) Twistor formulation of massive higher spin particle
- 10:45 – 11:05** **V. Krykhtin** (Tomsk State Pedagogical University, Russia) Quartic interaction vertex in the massive integer higher spin field theory in a constant electromagnetic field.

*11:05 – 11:20 Coffee break*

**Chairperson: N. Boulanger**

- 11:20 – 11:50** **E. Skvortsov** (Lebedev Physical Institute, Moscow, Russia) Higher-Spin theories on Light-Front.
- 11:55 – 12:25** **E. Joung** (Seoul National University, Korea) One-Loop Test of Free Adjoint Model Holographies.
- 12:30 – 13:00** **M. Grigoriev** (P.N. Lebedev Physical Institute, Moscow, Russia) Ambient space approach to higher spin holography.

*13:00 – 15:00 Lunch*

**Afternoon Session 15:30 – 18:15**

*Chairperson: E. Ivanov*

- 15:00 – 15:30 S. Kuzenko** (University of Western Australia, Crawley, Australia) Partial supersymmetry breaking on curved backgrounds.
- 15:35 – 16:05 K. Stepanyantz** (Moscow State University, Russia) Renormalization of supersymmetric theories with the higher derivative regularization.
- 16:10 – 16:30 B. Merzlikin** (Tomsk State Pedagogical University, Russia) Divergences in the abelian six-dimensional gauge theory.

*16:30 – 16:45 Coffee break*

*Chairperson: E. Joung*

- 16:45 – 17:15 D. Francia** (Scuola Normale Superiore and INFN, Pisa, Italy) Cubic interactions for Maxwell-like higher spins.
- 17:20 – 17:50 M. Taronna** (Universite Libre de Bruxelles, Belgium) Cubic interactions in Higher-Spin Theories from CFT.
- 17:55 – 18:15 T. Snegirev** (Tomsk State Pedagogical University, Russia) Unfolded formulation of massive higher spin supermultipletst in 3D.

**3<sup>rd</sup> August, WEDNESDAY**

**Morning Session 9:00 – 13:00**

*Chairperson: S. Kuzenko*

- 9:00 – 9:30** **G. Zoupanos** (National Technical University, Athens, Greece) Higher-Dimensional Unified Theories with continuous and fuzzy coset spaces as extra dimensions.
- 9:35 – 10:05** **A. Isaev** (Joint Institute for Nuclear Research, Dubna, Russia) R-matrix, star-triangle relations and Yangians for conformal algebras.
- 10:10 – 10:35** **T. Morozumi** (Hiroshima University, Japan) Time dependence of particle number asymmetry induced with CP violating interaction.
- 10:40 – 11:05** **S. Nicolis** (François Rabelais University, Tours, France) Supersymmetric constraints and stochastic processes: controlling the fluctuations in worldvolume and target space.

*11:05 – 11:20 Coffee break*

*Chairperson: T. Morozumi*

- 11:20 – 11:50** **E. Musaev** (Max-Planck-Institute for Gravitational Physics, Potsdam, Germany) Exotic branes from double field theory monopole.
- 11:55 – 12:25** **I. Bakhmatov** (Kazan Federal University, Russia) Fermionic T-duality in massive type IIA supergravity.
- 12:30 – 13:00** **R. Rahman** (Max Planck Institute for Gravitational Physics, Potsdam-Golm, Germany) Comments on Higher-Spin Fields in Nontrivial Backgrounds.

*13:00 – 15:00 Lunch*



**Afternoon Session 15:00 – 17:55**

*Chairperson: A. Isaev*

- 15:00 – 15:30 I. Batalin** (Lebedev Physical Institute, Moscow, Russia, **P. Lavrov** (Tomsk State Pedagogical University, Russia) Representation of a gauge field via intrinsic "BRST" operator.
- 15:35 – 16:05 A. Burinskii** (Institute of Nuclear Safety, Moscow, Russia) Supersymmetric source of the Kerr-Schild geometry specifies new path to the consistency of gravitation and quantum theory.
- 16:10 – 16:30 N. Kozyrev** (Joint Institute for Nuclear Research, Dubna, Russia)  $N=4$ ,  $d=3$  Born-Infeld theory in component approach.

**16:30 – 16:45** *Coffee break*

*Chairperson: G. Zoupanos*

- 16:45 – 17:05 C. Sleight** (Max Planck Institute for Physics, Munich, Germany) Quartic Interactions in Higher-Spin Theory from CFT.
- 17:10 – 17:30 H. Takata** (Tomsk State Pedagogical University, Russia) An unified approach for massive integer and half-integer higher spin field theory.
- 17:35 – 17:55 A. Reshetnyak** (Institute of Strength Physics and Materials Science, Tomsk, Russia) Lagrangian quantization rules for BRST-BFV Lagrangian formulations of totally symmetric HS fields on flat and AdS spaces.

## 4<sup>st</sup> AUGUST, THURSDAY

### Morning Session 9:00 – 13:00

*Chairperson: I. Shapiro*

- 9:00 – 9:30** **S. Sushkov** (Kazan Federal University, Russia)  
General dynamical properties in a scalar field model  
with nonminimal kinetic coupling
- 9:35 – 10:05** **Ya. Shnir** (Joint Institute for Nuclear Research,  
Dubna, Russia) Thermodynamics of black holes with  
non- Abelian hairs in AdS spacetime.
- 10:10 – 10:35** **A. Deriglazov** (Federal University of Juiz de Fora,  
Brazil) Mathisson-Papapetrou-Tulczyjew-Dixon  
equations in ultra-relativistic regime and  
gravimagnetic moment.
- 10:40 – 11:00** **P. Kazinski** (Tomsk State University, Tomsk, Russia)  
Unambiguous one-loop effective action.

*11:00 – 11:15 Coffee break*

*Chairperson: S. Sushkov*

- 11:15 – 11:45** **Y. Aldabergenov, S. Ketov** (Tokyo Metropolitan  
University and University of Tokyo, Japan)  
Cosmological inflation and grand unification.
- 11:50 – 12:10.** **A. Rudenko** (Institute of Nuclear Physics,  
Novosibirsk, Russia) Separated matter and antimatter  
domains with vanishing domain walls.
- 12:15 – 12:35.** **H. Sakamoto** (Hiroshima University, Japan) Inflation  
in Gauged Nambu-Jona-Lasinio model.
- 12:40 – 13:00.** **R. Kashapov** (Kazan Federal University, Russia)  
Casimir-Polder and Casimir effects for layered  
system.

*13:00 – 15:00 Lunch*

**Afternoon Session 15:00 – 18:10***Chairperson: P. Lavrov*

**15:00 – 15:20** **A. Avdoshkin** (Institute of Theoretical and Experimental Physics, Moscow; Moscow Institute of Physics and Technology, Russia) Microscopic description of chiral vortical effect.

**15:25 – 15:40** **S. Aleshin** (Moscow State University, Russia) Structure of loop integrals, regularized by the dimensional reduction, in N=1 SQED.

**15:45 – 16:00** **A. Kazantsev** (Moscow State University, Russia) Verification of NSVZ-type relations between the RG functions by calculating Feynman supergraphs in the three-loop approximation.

**16:00 – 16:15** *Coffee break*

*Chairperson: E. Musaev*

**16:15 – 16:30** **K. Orekhov** (Tomsk Polytechnic University, Russia) N=2 superparticle near black hole horizons.

**16:35 – 16:50** **A. Magazev, I. Shirokov** (Omsk State Technical University, Russia) The method of cohomological inclusion of an external electromagnetic field in the relativistic wave equations of Dirac and Klein-Gordon.

**16:55 – 17:10** **E. Mosman** (Tomsk State University, Russia) Symmetry algebra of Dirac equation on Lie groups.

**17:15 – 17:30** **A.V. Shapovalov, A. Breev** (Tomsk State University, Russia) Vacuum quantum effects and noncommutative symmetry

**17:35 – 17:50** **A.I. Breev, D. Ivanov** (Tomsk State University, Russia) Noncommutative integration method and partition functions on the Heisenberg-Weyl group.

**17:55 – 18:10** **T. Adorno** (Tomsk State University, Russia) Vacuum instability by a peak electric field as a t-electric potential step.

**19:00** *Banquet*

## 5<sup>th</sup> AUGUST, FRIDAY

### Morning Session 9:00 – 13:00

*Chairperson: S. Nicolis*

- 9:00 – 9:20** **V. Khatsimovsky** (Institute of Nuclear Physics, Novosibirsk, Russia)  $GL(4,R)$  representation of the gravity action on the piecewise flat spacetime.
- 9:25 – 9:45** **P. Fiziev** (Joint Institute for Nuclear Research, Dubna, Russia) New Physics in GRB150914.
- 9:50 – 10:05** **T. Boronenko** (Tomsk State Pedagogical University, Russia) Lie transformations algorithm for the autonomous Birkhoffian systems.
- 10:10 – 10:25** **N. Chuprikov** (Tomsk State Pedagogical University, Russia) On the one-particle formulation of the Dirac theory
- 10:30 – 10:45** **Yu. Kunashenko** (Tomsk State Pedagogical University, Russia) Gravitational radiation from channeled particles.
- 10:50 – 11:00** **I. Fartushev** (Tomsk State Pedagogical University, Russia) Single-photon positron annihilation on bound electron.

**11:00 – 11:15** **Coffee break**

*Chairperson: A. Burinskii*

- 11:15 – 11:40** **P. Tretyakov** (Joint Institute for Nuclear Research, Dubna, Russia) Dynamical stability of extended teleparallel gravity.
- 11:45 – 12:05** **A. Addazi** (University of L'Aquila, LNGS INFN, Italy) Anti evaporation in extended theories of gravity.
- 12:10 – 12:35** **M. Khurshudyan** (Institute for physical research, Yerevan, Armenia) On holographic dark energy models with Nojiri-Odintsov cut-off in general relativity.

5<sup>th</sup> August, FRIDAY

**12:40 – 13:00 D. Saez Gomez** (Institute of Astrophysics, Lisbon, Portugal and Institute of Space Sciences, Barcelona, Spain) Analysing future singularities in cosmology.

**13:00 – 15:00 Lunch**

**Afternoon Session 15:00 – 18:00**

***Chairperson: A. Addazi***

**15:00 – 15:20 A. Zayats** (Kazan Federal University, Russia) On the self-force in the Bopp-Podolsky electrodynamics on the curved spacetime background.

**15:25 – 15:45 K. Osetrin** (Tomsk State Pedagogical University, Russia) Pure radiation in space-time models that admit a separation of variables in the eikonal equation.

**15:50 – 16:10 A. Timoshkin** (Tomsk State Pedagogical University, Russia) Cosmological models coupled with dark matter in a dissipative universe.

**16:15 – 16:30 V. G. Bagrov<sup>1, 2, 3</sup>, D. M. Gitman<sup>1, 3, 4</sup>, A. D. Levin<sup>3</sup>, A. S. Loginov<sup>1</sup>, A. D. Saprykin<sup>1</sup>** (<sup>1</sup>Tomsk State University, Russia; <sup>2</sup>Institute of High Current Electronics, SB RAS, Tomsk, Russia; <sup>3</sup>Institute of Physics, University of São Paulo, Brazil; <sup>4</sup>P.N. Lebedev Physical Institute, Moscow, Russia) Effective width of the synchrotron radiation spectrum.

**16:30 – 16:45 Coffee break**

***Chairperson: Ya. Shnir***

**16:45 – 17:00 S. Abdrashitov** (Tomsk Polytechnic University, Russia) Channeling radiation as a source of high energy twisted photons.

**17:00 – 17:15 V.A. Bordovitsyn, A.V. Kulikova** (Tomsk State University, Russia) Spin as a source of relativistic radiation of electromagnetic angular momentum.

5<sup>th</sup> August, FRIDAY

**17:20 – 17:35 J. Janz** (Tomsk Polytechnic University, Russia)  
Radiation of a charged particle in periodically  
modulated crystal.

**17:40 – 18:00 V. Epp, M.A. Masterova** (Tomsk State Pedagogical  
University, Russia) The field of rotating asymmetric  
source in spiral coordinate system.

## 6<sup>th</sup> AUGUST, SATURDAY

### Morning Session 9:00 – 13:00

*Chairperson: M. Katanaev*

- 9:00 – 9:30** **S. Odintsov** (Catalonia Institute for Cosmic Research, Barcelona, Spain) The unified inflation-dark energy universe evolution in modified gravity.
- 9:35 – 10:05** **S. Capozziello** (University of Napoli "Federico II", Italy) Massive, massless and ghost models of Extended Gravity.
- 10:10 – 10:35** **M. De Laurentis** (Tomsk State Pedagogical University, Russia) Cosmological application of  $f(R,G)$  gravity.
- 10:40– 11:00** **V. Oikonomou** (TUSUR University, Tomsk, Russia, Tomsk State Pedagogical University, Russia) Some Classes of Gravitational Shock Waves from Higher Order Theories of Gravity.

**11:00 – 11:15** **Coffee break**

*Chairperson: S. Odintsov*

- 11:15 – 11:35** **A. Makarenko** (Tomsk State Pedagogical University, Russia) Bounce cosmology in Gauss-Bonnet gravity.
- 11:35 – 11:45** **E. Osetrin** (Tomsk State Pedagogical University, Russia) Space-time models with dust matter, admitting the integration of the Hamilton-Jacobi equation by separation of variables method.
- 11:50 – 12:00** **A. Kozlov** (Tomsk State University, Russia) Vacuum polarization in Bianchi IX cosmological model.
- 12:15 – 12:25** **A. Filippov** (Tomsk State Pedagogical University, Russia) Stackel spaces with pure radiation and cosmological constant in Einstein theory of gravity.

*Closure of the Conference 12:25*