



**QFT** &  
**2018** g



# **PROGRAMME**

**of the  
International Conference**

**QUANTUM FIELD THEORY AND GRAVITY**

*Tomsk State Pedagogical University  
July 30 – August 4, 2018  
Tomsk, Russia*

## **International Advisory Board**

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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 University**

**30<sup>th</sup> July, 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 E. Bergshoeff** (University of Groningen, the Netherlands) Nonrelativistic String Theory and T-Duality

**10:35 – 11:05 M. Vasiliev** (Lebedev Physical Institute, Moscow, Russia) From Coxeter higher-spin theories to strings and tensor models

*11:05 – 11:20 Coffee break*

*Chairperson: E. Bergshoeff*

**11:20 – 11:50 E. Ivanov** (Joint Institute for Nuclear Research, Dubna, Russia) New deformations of extended Supersymmetric mechanics

**11:55 – 12:25 K. Stelle** (Imperial College, London, UK) Integrable Structure and Mass Gaps in a Hyperbolic Braneworld

**12:30 – 13:00 D. Sorokin** (INFN and Padova University, Italy) Can Chern-Simons or Rarita-Schwinger be a Volkov-Akulov Goldstone?

*13:00 – 15:00 Lunch*

**Afternoon Session 15:00 – 18:05**

*Chairperson: K. Stelle*

**15:00 – 15:30 S. Krivonos** (Joint Institute for Nuclear Research, Dubna, Russia) Supersymmetric Calogero models

**15:35 – 16:05 A. Galajinsky** (Tomsk Polytechnic University, Russia) Cosmological aspects of the Eisenhart lift

**16:10 – 16:40 A. Sutulin** (Joint Institute for Nuclear Research, Dubna, Russia) Extended supersymmetric multidimensional mechanics and Calogero-like models

**16:40 – 16:55** *Coffee break*

*Chairperson: A. Galajinsky*

**16:55 – 17:15 S. Sidorov** (Joint Institute for Nuclear Research, Dubna, Russia) Deformed  $N = 8$  mechanics of  $(8, 8, 0)$  multiplets

**17:20 – 17:40 S.J. Gates, and S.N.H. Mak** (Brown University, Providence, USA) Examples of 4D,  $N=2$  Holoraomy

**17:45 – 18:05 N. Misuna** (Lebedev Physical Institute, Moscow, Russia) Lorentz covariance in higher-spin equations

**19:00** *Welcome Party*

31 July

**31<sup>st</sup> July, TUESDAY**

**Morning Session 9:00 – 13:00**

*Chairperson: S. Krivonos*

- 9:00 – 9:30** **Yu. Zinoviev** (Institute for High Energy Physics, Protvino, Russia) On Massive Supergravity
- 9:35 – 10:05** **D. Francia** (Enrico Fermi Center and Roma Tre University, Rome, Italy) On asymptotic charges at null infinity in any dimension
- 10:10 – 10:40** **S. Fedoruk** (Joint Institute for Nuclear Research, Dubna, Russia) Twistorial particles with continuous spin
- 10:45 – 11:00** **V. Krykhtin** (Tomsk State Pedagogical University, Russia) BRST approach to Lagrangian construction for bosonic continuous spin field
- 11:00 – 11:15** *Coffee break*

*Chairperson: D. Francia*

- 11:15 – 11:45** **S. Kuzenko** (University of Western Australia, Perth) Supersymmetric Higher Spin Theories
- 11:50 – 12:20** **M. Cederwall** (Chalmers University of Technology, Gothenburg, Sweden)  $L_\infty$  algebras for extended geometry
- 12:25 – 12:55** **V. Didenko** (Lebedev Physical Institute, Moscow, Russia) On locality in higher-spin equations

**12:55 – 15:00** *Lunch*

**Afternoon Session 15:00 – 18:00**

*Chairperson: M. Cederwall*

- 15:00 – 15:30 A. Barvinsky** (Lebedev Physical Institute, Moscow, Russia) BRST structure of renormalization in background covariant formalism.
- 15:35 – 16:05 P. Lavrov** (Tomsk State Pedagogical University, Russia) Quantum antibrackets
- 16:10 – 16:30 O. Gelfond** (Lebedev Physical Institute, Moscow, Russia and Scientific Research Institute of System Analysis, Moscow, Russia) Homotopy Operators and Locality Theorems in Higher-Spin Equations

*16:30 – 16:45 Coffee break*

*Chairperson: Yu. Zinoviev*

- 16:45 – 17:10 R. Rahman** (University of Dhaka, Bangladesh and Max Plank Institute for Gravitational Physics (Albert Einstein Institute), Potsdam-Golm, Germany) Gravitational Properties of the Proca Field.
- 17:15 – 17:30 T. Snegirev** (Tomsk State Pedagogical University, Russia) Three-dimensional massive higher spin supermultiplets
- 17:35– 18:00 A. Reshetnyak** (Institute of Strength Physics and Materials Science, Tomsk, Russia) Constrained higher spin fields within BRST approach: Lagrangian formulations, interactions, Feynman rules

1 August

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

**Morning Session 9:00 – 13:05**

*Chairperson: E. Ivanov*

**9:00 – 9:30 G. Zoupanos** (National Technical University, Athens, Greece) From Kaluza-Klein Theory to Non-Commutative Gauge Theories of Gravity

**9:35 – 10:05 A. Isaev** (Joint Institute for Nuclear Research, Dubna, Russia) Two-spinor description of massive particles and relativistic spin projection operators

**10:10 – 10:35 E. Babichev** (Laboratory of Theoretical Physics Orsay, France) Hamiltonian vs stability and application to Horndeski theory

**10:40 – 11:05 I. Bakhmatov** (Asia Pacific Center for Theoretical Physics, Pohang, Republic of Korea) Classical Yang-Baxter equation from supergravity

*11:05 – 11:20 Coffee break*

*Chairperson: G. Zoupanos*

**11:20 – 11:50 K. Stepanyantz** (Moscow State University, Russia). How to construct the NSVZ and NSVZ-like schemes

**11:55 – 12:10 A. Kazantsev** (Moscow State University, Russia) Three-loop renormalization group functions in N=1 supersymmetric Yang--Mills theories regularized by higher covariant derivatives.

**12:15 – 12:30 B. Merzlikin** (Tomsk State Pedagogical University, Russia) Low-energy effective action in 6D, N=(1,0) SYM

**12:35 – 13:05 S. Rubin** (Moscow Engineering Physics Institute, Russia) Inhomogeneous extra spaces

*13:05 – 15:00 Lunch*



**Afternoon Session 15:00 – 18:20**

*Chairperson: A. Isaev*

**15:00 – 15:30 B. Ovrut** (University of Pennsylvania, Philadelphia, USA) Mathematics/Physics and Cosmology of the B-L MSSM

**15:35 – 16:05 E. Buchbinder** (University of Western Australia, Perth) Towards physical Yukawa couplings in heterotic model building

**16:10 – 16:30 M. Katanaev** (Steklov Mathematical Institute, Moscow, Russia). Disclinations in the geometric theory of defects

*16:30 – 16:45 Coffee break*

*Chairperson: A. Barvinsky*

**16:45 – 17:15 R. Percacci** (International School for Advanced Studies, Trieste, Italy) UNimodular quantum gravity

**17:20 – 17:50 I. Shapiro** (Universidade Federal de Juiz de Fora, Brazil) Anomaly-induced effective action of gravity: formal developments and applications

**17:55 – 18:20 E. Musaev** (Moscow Institute of Physics and Technology, Russia) Dynamics of five branes in Double Field Theory

**2<sup>nd</sup> AUGUST, THURSDAY**

**Morning Session 9:00 – 12:50**

*Chairperson: R. Percacci*

- 9:00 – 9:30** **E. Elizalde** (Catalonia Institute for Cosmic Research and Autonomous University of Barcelona, Spain) Zeta functions, vacuum fluctuations and cosmology
- 9:35 – 9:55** **K. Koutrolikos** (Masaryk University, Brno, Czech Republic) Higher spin supercurrents in supersymmetric theories
- 10:00 – 10:25** **F. Riccioni** (INFN Roma La Sapienza, Università di Roma "La Sapienza", Italy) Space-filling branes & gaugings
- 10:30 – 10:45** **Yu. Markov, M. Markova, A. Bondarenko** (Matrosov Institute for System Dynamics & Control Theory, Irkutsk, Russia) Unitary quantization and para-Fermi statistics
- 10:50 – 11:05** **M. Markova Yu. Markov, A. Bondarenko** (Matrosov Institute for System Dynamics & Control Theory, Irkutsk, Russia) Higher order wave equation in Bhabha-Madhavarao spin-3/2 theory.

*11:05 – 11:20 Coffee break*

*Chairperson: E. Elizalde*

- 11:20 – 11:40** **A. Burinskii** (Nuclear Safety Institute, Moscow, Russia) Kerr-Schild gravity as "New Physics» beyond the Standard Model
- 11:45 – 12:05** **V. Khatsymovsky** (Budker Institute for Nuclear Physics, Novosibirsk, Russia) Discrete connection gravity and finite diagram technique
- 12:10 – 12:25** **Y. Matsuo** (Hiroshima University, Japan) Modified gravity theory explains Dark Matter

2 August

**12:30 – 12:50 N. Kozyrev** (Joint Institute for Nuclear Research, Dubna, Russia) Component action of  $N=(2,0)$ ,  $d=6$  Born-Infeld theory

**13:00 – 15:00 Lunch**

**Afternoon Session 15:00 – 18:10**

***Chairperson: I. Shapiro***

**15:00 – 15:20 A. Rudenko** (Budker Institute of Nuclear Physics, Novosibirsk State University, Russia) Domain walls in early universe

**15:25 – 15:40 A. Kotanjyan** (Yerevan State University, Armenia) VEVs of Fermionic Charge and Current Densities in Two Dimensional Rings

**15:45 – 16:00 P. Kazinski** (Tomsk State University, Russia) Probability of radiation of twisted photons in the infrared domain.

**16:00 – 16:15 Coffee break**

***Chairperson: K. Stepanyantz***

**16:15 – 16:45 H. Sako** (Japan Atomic Energy Agency (JAEA), Ibaraki, Japan) Studies of strange hadrons and baryonic dense matter at J-PARC

**16:50 – 17:15 O. Tanaka** (High Energy Accelerator Research Organization (KEK), Ibaraki, Japan), **V. Bordovitsyn** (Tomsk State University, Russia) Review of photons carrying orbital angular momentum studies with theories and experimental evaluations.

**17:20 – 17:35 V. Bordovitsyn, A. Kulikova** (Tomsk State University, Russia), **O. Tanaka** (High Energy Accelerator Research Organization (KEK), Ibaraki, Japan) Angular momentum of convective electromagnetic field of relativistic charged particles

2 August

**17:40 – 17:55 V. Bordovitsyn, A.V. Kulikova** (Tomsk State University, Russia) Spin-vortex radiation from relativistic charged particles

**18:00 – 18:10 G. Lazarenko** (Tomsk State University, Russia)  
Probability of radiation of twisted photons by classical currents

**19:00 *Banquet***

**3<sup>rd</sup> AUGUST, FRIDAY****Morning Session 9:00 – 13:00***Chairperson: S. Rubin*

- 9:00 – 9:30** **S. Odintsov** (Catalonia Institute for Cosmic Research and Autonomous University of Barcelona, Spain) The universe history from modified gravity: from inflation till dark energy
- 9:35 – 10:05** **S. Capozziello** (University of Naples "Federico II", Italy) Gravitational waves in modified teleparallel theories of gravity.
- 10:10 – 10:40** **S. Sushkov** (Kazan Federal University, Russia) Cosmological perturbations in the theory of gravity with non-minimal kinetic coupling
- 10:45 – 11:00** **M. De Laurentis** (Università di Napoli, Federico II, Italy) Noether's stars in  $f(R)$  gravity.

**11:00 – 11:15** **Coffee break***Chairperson: E. Babichev*

- 11:15 – 11:45** **V. Oikonomou** (Aristotle University of Thessaloniki, Greece) Aspects of  $f(R)$  gravity from phase space analysis.
- 11:50 – 12:10** **P. Tretyakov** (Joint Institute for Nuclear Research, Dubna, Russia) Cosmology in modified  $f(R,T)$ -gravity.
- 12:15 – 12:30** **M. Khurshudyan** (University of Science and Technology of China, Hefei, China) Interacting dark energy models in light of Gaussian processes.
- 12:35 – 13:00** **V. Berezin** (Institute for Nuclear Research, Moscow) On the theory of double layer in Weyl + Einstein gravity.

**13:00 – 15:00** **Lunch**

**Afternoon Session 15:00 – 18:05**

*Chairperson: M. Katanaev*

- 15:00 – 15:20** **A. Timoshkin** (Tomsk State Pedagogical University, Russia) Description of the inflationary universe with viscosity
- 15:25 – 15:45** **G. Sharov** (Tver State University, Russia) F(R) and other cosmologies under recent data analysis.
- 15:50 – 16:10** **E. Osetrin** (Tomsk State Pedagogical University, Russia) Pure radiation in space-time models that admit integration of the eikonal equation by the separation of variables method
- 16:15 – 16:30** **K. Osetrin** (Tomsk State Pedagogical University, Russia) Gravitational waves in spatially homogeneous models of space-time

*16:30 – 16:45 Coffee break*

*Chairperson: S. Sushkov*

- 16:45 – 17:05** **S. Nicolis** (University of Tours and CNRS, France) Two-dimensional WZ models as gauge theories
- 17:10 – 17:25** **H. Takata** (Tomsk State Pedagogical University, Russia) BRST approach to Lagrangian construction for continuous spin and massive higher spin field
- 17:30 – 17:45** **T. Shestakova** (Southern Federal University, Rostov-on-Don, Russia) Derivation of the Schrödinger equation for theories with Grassmann variables from a path integral and its application to quantization of gravity
- 17:50 – 18:05** **A. Chekmenev** (Lebedev Physical Institute, Moscow, Russia) Generating formulation for higher spin fermions
- 18:10 – 18:30** **D.V. Gal'tsov, S.M. Zhidkova** (Moscow State University) First order derivatively coupled scalar-tensor theory and non-singular cosmology

**4<sup>th</sup> AUGUST, SATURDAY****Morning Session 9:00 – 12:45***Chairperson: V. Berezin*

- 9:00 – 9:15** **A. Filippov** (Tomsk State Pedagogical University, Russia) Models of the general scalar-tensor theory of gravitation with radiation, allowing the separation of variables in the Hamilton-Jacobi equation for test particles
- 9:20 – 9:40** **A. Shapovalov** (Tomsk State University, Russia), **A. Trifonov** (Tomsk Polytechnic University) Asymptotic solutions to the Fisher-KPP equation.
- 9:45 – 10:00** **A. Deriglazov** (Universidade Federal de Juiz de Fora, Brazil) Frame-dragging effect in the field of non-rotating body due to unit gravimagnetic moment
- 10:05 – 10:20** **Yu. Kunashenko** (Tomsk State Pedagogical University, Russia) Coherent production of electron-positron pairs in channeled state by photon
- 10:25 – 10:45** **V. Epp, O. Pervukhina** (Tomsk State Pedagogical University, Russia) Particle dynamics in the field of rotating magnetized stars.

*10:45 – 11:00 Coffee break**Chairperson: I. Bakhmatov*

- 11:00 – 11:15** **A. Breev** (Tomsk State University, Russia) Vacuum polarization of scalar and spinor fields on the homogeneous spaces

4 August

- 11:20 – 11:30 T. Boronenko** (Tomsk State Pedagogical University, Russia) An accelerated convergence algorithm of the Lie transformations for Hamiltonian systems
- 11:35 – 11:45 N. Chuprikov** (Tomsk State Pedagogical University, Russia) Stone-von Neumann theorem and superposition principle: scattering a particle on a 1D potential barrier
- 11:50 – 12:00 D. Chernyavsky** (Tomsk Polytechnic University) Cosmological constant as a conserved charge.
- 12:05 – 12:15 A. Kulagin** (Tomsk Polytechnic University, Russia) Nonlocal Gross-Pitaevskii equation asymptotic solutions, semiclassically concentrated on curves
- 12:20 – 12:30 O. Zyryanova** (Tomsk State Pedagogical University, Russia) On the Jacobi-type identities
- 12:35 – 12:45 V. Tlyachev, R. Bedanokov** (Adyg State University, Maikop, Russia). On the effect of radiation damping on the angular distribution of synchrotron radiation.

*Closure of the Conference 12:45*