

**MINISTRY OF EDUCATION AND SCIENCE OF THE REPUBLIC OF
KAZAKHSTAN**

L.N. GUMILYOV EURASIAN NATIONAL UNIVERSITY

EURASIAN INTERNATIONAL CENTER OF THEORETICAL PHYSICS

The 3rd International Conference

**ASTROPHYSICS,
GRAVITY AND COSMOLOGY**

30 November – 2 December, 2016

P R O G R A M

Astana, Kazakhstan

**Organizing committee of
the 3rd International conference
«Astrophysics, Gravity and Cosmology»**

Chairman

Myrzakulov R. Director of “Eurasian International Center of Theoretical Physics” and head of the Department “General and Theoretical Physics”

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13	Sarsenbek A.	Lecturer
14	Bekov S.	PhD student
15	Bekova G.	PhD student
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Conference homepage:

www.enu.kz/en/science/astrophysics-gravity-and-cosmology/

30 November, Wednesday

- 9:00-10:00 **Registration** (Main Building, room 303)
- 10:00-10:10 **OPENING CEREMONY** (Main Building, room 303)
- PLENARY SESSION** (Main Building, room 303)

Chairman: Myrzakulov R.

- 10:10-10:40 **Good M.** (Nazarbayev University, Astana, Kazakhstan) *Reflections on Black Mirrors*
- 10:40-11:10 **Malafarina D.** (Nazarbayev University, Astana, Kazakhstan) *The final fate of gravitational collapse with semi-classical corrections*
- 11:10-11:40 **Momeni D.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Quantum complexity as dual to a volume in AdS/CFT*
- 11:40-12:00 Coffee break

Chairman: Malafarina D.

- 12:00-12:20 **Myrzakulov R.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Some AGC investigations at EICTP*
- 12:20-12:40 **Güdekli E.** (Istanbul University, İstanbul, Turkey) *Noether symmetry approach in FRW cosmological models with fermionic fields*
- 12:40-13:00 **Abdikamalov E.** (Nazarbayev University, Astana, Kazakhstan) *The Explosions of Massive Stars*
- 13:00-14:00 Lunch break

Chairman: Good M.

- 14:00-14:15 **Beznosko D.** (Nazarbayev University, Astana, Kazakhstan) *Unusual structures in ultra-high energy cosmic ray air showers - new physics indication*
- 14:15-14:30 **Yerzhanov K.K., Myrzakulov N.A., Bauyrzhan G.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Cosmology of $F(R,T,X,\phi)$ model*

- 14:30-14:45 **Myrzakulov K.R.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Noether symmetry in $F(T)$ -gravity with non-canonical fermion fields*
- 14:45-15:00 **Myrzakulov N.A., Tursumbayeva G.P.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *$F(T)$ gravity with scalar and fermion fields in $(2+1)$ dimensions*
- 15:00-15:15 **Myrzakulov Y., Bekov S., Sandal B.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Generalized first and second laws of thermodynamics in $F(T)$ theory of gravity with f -essences*
- 15:15-15:30 **Urazalina A., Singleton D.** (Al-Farabi Kazakh National University, Almaty, Kazakhstan, California State University, Fresno, USA) *Domain and spherically symmetrical solutions in GR with potentials of the 4th, 6th and 8th orders*
- 15:30-15:45 Coffee break

Chairman: Güdekli E.

- 15:45-16:00 **Yesmakhanova K.R., Shegay Zh.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Determinant representation of the two-fold Darboux transformation of $(1+1)$ -dimensional nonlinear Schrödinger-Maxwell-Bloch equations*
- 16:15-16:30 **Nugmanova G.N., Tattibekov K.S.** (L.N. Gumilyov Eurasian National University, Taraz state pedagogical Institute, Kazakhstan) *Some integrable spin systems*
- 16:30-16:45 **Shaikhova G.N.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Hirota's bilinear method and its application to coupled generalized nonlinear Schrödinger equations*
- 16:45-17:00 **Tilepova A., Sarsenbek A.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Exact solution in Einstein's vacuum field equations*

Chairman: Abdikamalov E.

- 17:00-17:10 **Ramazan M., Razina O.V.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Conformal interaction associated with the cosmological dynamics*
- 17:10-17:20 **Bazylyzhanova A.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Integrable motion of curves*

- 17:20-17:30 **Talipova D.N., Myrzakulov R.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Equivalent analog of the Landau-Lifshits equation with anisotropy*
- 17:30-17:40 **Duseiyev Y., Myrzakulov R.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Darboux transformation and solution of the (1+1)-dimensional two-component Hirota-Maxwell-Bloch equation*
- 17:40-17:50 **Adylkhan F.Zh., Myrzakulov R.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *The one soliton solution for strong gravity waves*
- 17:50-18:00 **Ozat N., Shaikhova G.N., Serikbayev N.S.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Darboux transformation and soliton solutions of the two-component Hirota equations*

2 December, Friday

SECTIONAL MEETING (Main Building, room 303)

Chairman: Momeni D.

- 10:00-10:30 **Chechin L.M., Kairatkyzy D., Konusbayev T.** (V. G. Fessenkov Astrophysical Institute, Almaty, Kazakhstan) *Galaxies formation on the oscillating dark matter's background*
- 10:30-11:00 **Shahalam M., Myrzakulov R.** (Institute for Advanced Physics & Mathematics, Zhejiang University of Technology, Hangzhou, China) *Dark Energy and its Diagnostics*
- 11:00-11:20 **Abishev M.E., Toktarbay S., Talkhat A., Abylayeva A.** (Al-Farabi Kazakh National University, Almaty, Kazakhstan) *Motion of the test body in the field of extended body with the inner structure in GR*
- 11:20-11:30 **Toktarbay S., Quevedo H., Abishev M. E.** (Al-Farabi Kazakh National University, Almaty, Kazakhstan) *The corresponding approximate exterior and interior solutions of Einstein's equations*
- 11:30-11:40 **Abishev M. E., Toktarbay S., Ablayeva A. Zh., Talgat A. Z.** (Al-Farabi Kazakh National University, Almaty, Kazakhstan) *The stability of periodic motions of the restricted three-body problem*
- 11:40-12:00 Coffee break

Chairman: Shaikhova G.N.

- 12:00-12:10 **Myrzakul Aizhan** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Holographic Entanglement Entropy, Fidelity Susceptibility and Holographic Complexity for D3-Brane*
- 12:10-12:20 **Abishev M., Malybayev A., Quevedo H.** (Al-Farabi Kazakh National University) *The cosmological constant as a thermodynamic variable*
- 12:20-12:30 **Myrzakul Akbota** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Multilayer spin systems and the vector nonlinear Schrödinger equation*
- 12:30-12:40 **Urazalina A., Singleton D.** (Al-Farabi Kazakh National University, Almaty, Kazakhstan, California State University, Fresno, USA) *Wormhole and cylindrically symmetric solutions in GR with potentials of the 4th, 6th and 8th orders*
- 12:40-12:50 **Syzdykova A.M., Yersultanova Z.S.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *One-soliton solution of the Schrödinger-Maxwell-Bloch system.*
- 12:50-13:00 **Bekov S.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Anisotropic Universe in a modified teleparallel gravity and k-essence*
- 13:00-14:00 Lunch break

Chairman: Nugmanova G.N.

- 14:00-14:10 **Toktamysheva R.D., Akanova R.A.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *The model of the gravity collapse with scalar field*
- 14:10-14:20 **Bekova G.T.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *One-soliton solutions of the (2+1)-dimensional two-component Hirota's equation*
- 14:20-14:30 **Zhassybayeva M.B., Yersultanova Z.S.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Single soliton solutions for equations of the Kaup-Newell systems*
- 14:30-14:40 **Sagidullayeva Zh.M.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Two-layer spin system with self-consistent potential*

- 14:40-14:50 **Kurbangaliyeva A.K., Shaikhova G.N.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Nonlinear waves of the generalized variable-coefficient complex modified Korteweg - de Vries equation*
- 14:50-15:00 **Zhapparova M.S., Shaikhova G.N.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *One soliton solution of the generalized variable-coefficient Shrodinger – Maxwell – Bloch equations*
- 15:00-15:10 **Chulakova A.M., Shaikhova G.N.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Soliton solutions of the coupled Nonlinear Shrodinger Equation of Manakov type*
- 15:10-15:20 **Bedelkhanova A., Shaikhova G.N.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Exact solution of the coupled higher order nonlinear Shrodinger equations*
- 15:20-15:30 **Tobylgiyeva B.B., Shaikhova G.N., Serikbayev N.S.,** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Multi-soliton solutions of the Hirota equation*
- 15:30-15:40 **Sergazina A.M., Yesmakhanova K.R.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *One-soliton solutions of (1+1)-dimensional Hirota-Maxwell-Bloch equation*
- 15:40-15:50 **Tuleeva A.D., Myrzakulov K.R.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Power law solution in nonlinear sigma model and dark energy*
- 15:50-16:00 **Yesmakhanova K.R., Zhubayeva Zh.S.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Exact solution of the (1+1)-dimensional inhomogeneous Hirota-Maxwell-Bloch type equation*

Chairman: Myrzakulov Y.

- 16:00-16:10 **Yeltayeva A., Bauyrzhan G.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Model of modified gravity with a viscous fluid*
- 16:10-16:20 **Bekkhodzhayev S.O., Kazakbayev Zh.B., Harahat E.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Hojman symmetry approach in $F(T)$ gravity*
- 16:20-16:30 **Bekbolatova A.T., Meirbekov B.K., Myrzakulova B.Z.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Frobenus' theorem and accelerated expansion of the Universe*

- 16:30-16:40 **Aliyev B.Zh.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Dependence superconducting properties of ceramics YBA2CU3O7-x on the amount of oxygen in the ceramics*
- 16:40-16:50 **Syzdyk A.M., Yesmakhanova K.R.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Darboux transformation of the (1+1)-dimensional inhomogeneous Hirota-Maxwell- Bloch type equation*
- 16:50-17:00 **Kalybai Zh., Ozat N., Bekov S.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Noether symmetry in teleparallel gravity with k-essence*
- 17:00-17:10 **Myrzakulova Zh.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Integrable 2-layer spin system in (2+1)-dimensions*
- 17:10-17:20 **Khassenov S.O., Razina O.V.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Interaction in the dark sector of the two scalar fields*
- 17:20-17:30 **Myrzakul S.R., Myrzakul T.R.** (Al-Farabi KazNU, Almaty) *Effect of the nonstationarity equation of state of non-baryonic matter at the evolution of the early Universe*
- 17:30-17:40 **Kalybai Zh.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Introduction to Gromov-Witten theory*
- 17:40-17:45 **Myrzakulov N.A.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Cosmological models of F(R) gravity with k-essence*
- 17:45-17:50 **Altaibayeva A.B., Myrzakulov R.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Revisiting the geometrothermodynamics of higher dimensional blackholes: Euler identity*
- 17:50-18:00 **Tsyba P.Y.** (L.N. Gumilyov Eurasian National University, Astana, Kazakhstan) *Energy conditions in the cosmological models with generalized equation of state*

CLOSING OF THE CONFERENCE