

**PROGRAM  
OF THE SECOND  
INTERNATIONAL  
CONFERENCE  
"Autumn Mathematical  
Readings in Adygea"**



**October 20-24, 2017  
Maikop**

## Friday, October 20

15.00 – 21.00 Registration of conference participants

*(Lobby of the Assembly hall of the main building of ASU, Pervomayskaya str., 208)*

## Saturday, October 21

09.00 – 10.00 Registration of conference participants

*(Lobby of the Assembly hall of the Main Building of ASU, Pervomayskaya str., 208)*

10.00 – 13:30 Opening of the conference. Plenary session (Chair. Mamiy D.K.)

*(Assembly Hall of the Main Building of ASU, Pervomaiskaya str., 208)*

10:00-10:10 Greeting speech of the Rector of the Adyghe State University Khunagov R.D.

10:10-10:15 Welcome speech of the Dean of the Faculty of Mathematics and Computer Science of Adyghe State University Mamiy D.K.

10:15-10:55 Invariants of polyhedra that are constant during flexions  
*Gaifullin A.A. (Russia, Moscow, Steklov Mathematical Institute of RAS, Moscow, Russia., Lomonosov MSU)*

11:00-11:40 Singularities of cyclic processes optimization  
*Davydov A.A. (Russia, Moscow, Lomonosov MSU, National University of Science and Technology "MISIS" Austria, Laxenburg, International Institute for Applied System Analysis)*

11.40 – 12.00 Coffee break

12:00-12:40 Classic and new problems about random graphs  
*Raigorodskii A.M. (Russia, Moscow, MIPT)*

12:45-13:25 Acoustic Traps and Lattices for Electrons in Semiconductors  
*Giedke Geza (Spain, San Sebastián, Donostia International Physics Center)*

14.00 – 15.00 Lunch (ASU Dining, Pervomayskaya str., 208)

15.00 – 19.00 Work on sections

### Section Discrete mathematics

*(headed by Raigorodskii A.M.) (Main building of ASU, room 323 B)*

15:00-15:20 Probabilistic and Kolmogorov extractors with multiple sources  
*Musatov D.V., (Russia, Moscow, MIPT)*

15:25-15:45 Around Young's theorem  
*Dolnikov V.L. (Russia, Moscow, MIPT)*

15:50-16:10 About the special integral in the problem on the weighted number of integer points on multidimensional hyperboloids  
*Dokhov R.A., Pachev U.M., Shakova T.A. (Russia, Nalchik, Kabardino-Balkarian State University named after Kh. M. Berbekov)*

16:15-16:35 On finiteness of spectra of first order random graph properties  
*Matushkin A.D. (Russia, Moscow, MIPT)*

16:40-17:00 On the polyhedral graph of the pyramidal tours  
*V. A. Bondarenko (Russia, Yaroslavl, P.G. Demidov Yaroslavl State University)*

17:05-17:25 Turan type bounds for distance graphs  
*Shabanov L.E. (Russia, Moscow, MIPT)*

17:30-17:50 Existential monadic second order properties of a random graph  
*Zhukovskii M.E. (Russia, Moscow, MIPT)*

17:55-18:05 On the environment of the vertices of fractal graphs  
*Reznikov A.V. (Russia, Maikop, ASU)*

### Section Differential Equations, Dynamical Systems and Control Theory

*(headed by Davydov A.A.) (Main building of ASU, room 410)*

15:00-15:20 The theory of boundary value problems of differential beams with multiple characteristics  
*Vagabov A.I. (Russia, Makhachkala, Dagestan State University)*

15:25-15:45 Separatrices estimates of phase synchronization dynamical systems  
*Aleksandrov K.D. (Russia, Saint-Petersburg, Saint-Petersburg State University)*

15:50-16:10 On a priori estimate of the solution to the first boundary value problem for the model equation of mixed parabolic-hyperbolic type with a non-characteristic line of type changing  
*Balkizov Zh.A. (Russia, Nalchik, Institute of Applied Mathematics and Automation of Kabardin-Balkar Scientific Center of RAS)*

16:15-16:35 Kalman conjecture in theory of differential equations. Counterexamples and hidden attractors  
*Mokaev R.N. (Russia, Saint-Petersburg, Saint-Petersburg State University)*

16:40-17:00 About boundary-value problem for infinite system of ordinary differential equations.  
*Tankiev I.A. (Russia, Ingush State University),  
Kodzoeva F.D. (Russia, Ingush State University)*

### Section Mathematical Modeling, Numerical and Asymptotic Methods

*(headed by Soloviev A.N.) (Main building of ASU, room 309)*

15:00-15:20 Inequalities of fejer type for harmonics of nonnegative trigonometric polynomials  
*Danchenko V.I. (Russia, Vladimir, Vladimir State University)*

15:25-15:45 A difference scheme of high order of approximation for the subdiffusion equation  
*Alikhanov A.A. (Russia, Nalchik, Institute of Applied Mathematics and Automation of Kabardin-Balkar Scientific Center of RAS)*

15:50-16:10 Estimates of Modeling Errors in Case of Homogenization  
*Samrowski T.S. (Switzerland, Zürich, Zurich University of Applied Science)*

16:15-16:35 Piecewise quadratic approximation on plane  
*Podkolzin V.V. (Russia, Krasnodar, Kuban State University)*

16:40-17:00 Mathematical modeling of gravitational convection in electromembrane systems with the account of the dissociation / recombination reaction of water molecules  
*Urtenov M.H. (Russia, Krasnodar, Kuban State University)*

17:05-17:25 Questions of simulation of dynamic phenomena of aeroelasticity  
*Lukashchik E.P. (Russia, Krasnodar, Kuban State University)*

17:30-17:55 Definition parameters of the functional network by the method of back propagation error  
*Uvarova A.V. (Russia, Krasnodar, Kuban State University)*

## Section Computer Science, Data Analysis and Information Processing

(headed by Aliev M.V.) (Main building of ASU, room 327)

- 15:00-15:20 Algorithms for the calculation of the confidence interval and their program implementation  
*Simankov V.S. (Russia, Krasnodar, Kuban State Technological University)*  
*Buchatskaya V.V. (Russia, Maikop, ASU)*  
*Teplouhov S.V. (Russia, Maikop, ASU)*
- 15:25-15:45 The information basis for construction models of renewable energy sources in geoinformation systems  
*Buchatsky P.Yu. (Russia, Maikop, ASU)*
- 15:50-16:10 The profile of the basic preparation for informatics of the bachelor of applied mathematics  
*Garkusha O.V. (Russia, Krasnodar, Kuban State University)*  
*Dobrovolskaya N.Yu. (Russia, Krasnodar, Kuban State University)*
- 16:15-16:35 The role of research activities of students in the training of programming on the example of the themes "matrix"  
*Kharchenko A.V. (Russia, Krasnodar, Kuban State University)*
- 16:40-17:00 Construction of optimum module neuron networks with the vectorial criterion for the Big data processing  
*Chetyrbok, P.V. (Russia, Yalta, the Crimean Federal University named after V.I. Vernadsky branch in the city of Yalta)*
- 17:05-17:25 The program module of creation of model of the violator for PDIS  
*Zlatina K.S. (Russia, Krasnodar, Kuban State Technological University)*
- 17:30-17:50 Automation of formation processes for security requirements in PDIS and SIS information according to requirements of FSTEC of Russia  
*Shustova I.V. (Russia, Krasnodar, Kuban State Technological University)*
- 17:55-18:05 Block encoding hyperspectral imaging with adaptive selection of encoding transformation  
*Kasparyan M.S. (Russia, Innopolis, Innopolis University)*

## Sunday, October 22

09.00 – 12.30 Plenary session (Chair. Davydov A.A.)

(Conference hall of hostel №4 ASU, Pervomayskaya str., 208)

- 09:00-09:40 Extremal problems for families of subsets not containing certain subfamilies  
*Gyula O. H. Katona (Hungary, Budapest,*  
*Alfréd Rényi Institute of Mathematics, Hungarian Academy of Sciences)*
- 09:45-10:25 Gromov's Waist for cubes and spheres  
*Karasev R.N. (Russia, Moscow, MIPT)*

10.30 – 10.50 Coffee break

- 10:50-11:30 Differential equations with hysteresis operators  
*Shumafov M.M. (Russia, Maikop, ASU)*
- 11:30-12:00 Recognition of finite simple groups  
*A.Kh. Zhurkov (Russia, Nalchik, Institute of Applied Mathematics and Automation of Kabardin-Balkar Scientific Center of RAS)*

12.00 – 13.00 Lunch (ASU Dining, Pervomayskaya str., 208)

13.00 – 18.00 Excursion to the foothills of the Western Caucasus

## Monday, October 23

09.00 – 13:30 Plenary session (Chair. Gaifullin A.A.)

(Assembly Hall of the Main Building of ASU, Pervomaiskaya str, 208)

09:00-09:40 Symmetries and conservation laws for hyperbolic equations

*Shabat A.B. (Karachaevsk, Karachay-Cherkess State University named after U.D. Aliev, ITP RAS named after L.D. Landau)*

09:45-10:25 The problem of non-Gaussianity and harmonic analysis in observational cosmology

*Verkhodanov O.V. (Nizhniy Arkhyz, Special Astrophysical Observatory of the Russian Academy of Sciences)*

10.30 – 10.50 Coffee break

10:50-11:30 Representations of quantum groups and integrable models in field theory and statistical physics

*Nirov H.S. (Moscow, Institute for Nuclear Research, Russian Academy of Sciences)*

11:35-12:15 Theory and methods for QM/MM simulations: realization and applications

*Koval P. G. (Spain, San Sebastián, Donostia International Physics Center)*

14.00 – 15.00 Lunch (ASU Dining, Pervomayskaya str., 208)

14.00 – 19.00 Work on sections (Main Building of ASU, Pervomaiskaya str., 208)

### Section Number Theory and Applications

(headed by Osipyany V.O.) (Main building of ASU, room 323 B)

14:00-14:20 Sharygin triangles and elliptic curve

*Savvateev A.V. (Russia, Moscow, MIPT)*

14:25-14:45 Mathematical model of alphabetic cryptosystems based on A-M knapsack (backpack)

*Osipyany V.O. (Russia, Krasnodar, Kuban State University)*

14:50-15:10 On hyperoperatorial interpretation of knapsack data protection systems

*Tlyusten V.Sh. (Russia, Maikop, ASU)*

15:15-15:35 On the distribution of prime twin numbers

*Andrukhayev H.M. (Russia, Maikop, ASU)*

15:40-16:00 Condensation of prime numbers and graph of their encloses

*Rozhkova M.V. (Russia, Krasnodar, Krasnodar college of management, equipment and technologies)*

16:05-16:25 Experimental number theory: mean value of function of Euler

*Rozhkov A.V. (Russia, Krasnodar, Krasnodar college of management, equipment and technologies)*

16:30-16:50 Durability analysis of the non-standard knapsacks information security systems

*Karpenko Y.A. (Russia, Maikop, ASU)*

16:55-17:15 Waring's problem in natural numbers with binary expansions of a special form.

*Eminyan K.M. (Moscow, Financial University)*

## Section Differential Equations, Dynamical Systems and Control Theory

*(headed by Shumafov M.M.) (Main building of ASU, room 410)*

- 14:00-14:20 On the number of invariant sets of a polynomial vector field  
*Ushkho D.S., Ushkho A.D. (Russia, Maikop, ASU)*
- 14:25-14:45 Pseudodifferential operators of variable order in Hölder–Zygmund spaces of variable smoothness  
*Kryakvin V.D. (Russia, Rostov-on-Don, Southern Federal University)*
- 14:50-15:10 Example of discrepancy of the complete and vector hyper frequencies of solutions of the two-dimensional differential system  
*Stash A.Kh. (Russia, Maikop, ASU)*
- 15:15-15:35 The first boundary value problem in a nonlocal setting for the generalized Hallaire equation  
*Makaova R.Kh. (Russia, Nalchik, Institute of Applied Mathematics and Automation of Kabardin-Balkar Scientific Center of RAS)*
- 15:40-16:00 A "logarithmic" Dirichlet problem  
*Badakhov M.Sh. (Russia, Karachaevsk, Karachay-Cherkess State University)*

## Section Mathematical Modeling, Numerical and Asymptotic Methods.

### Theoretical and Mathematical Physics

*(headed by Urtenov M.A.K) (Main building of ASU, room 309)*

- 14:00-14:20 Finite-element modeling a system the elastic body and piezo transducer applied to medical devices  
*Soloviev A.N. (Russia, Rostov-on-Don, Don State Technical University)*
- 14:25-14:45 On functions of limitary polarization used in models of polarization of ferroelectrics  
*Skaliukh A.S. (Russia, Rostov-on-Don, Don State Technical University)*
- 14:50-15:10 Effect of radiative damping on the evolution of angular distribution of harmonic synchrotron radiation  
*Tlyachev V.B., Boychenko S.E. (Russia, Maikop, ASU)*
- 15:15-15:35 Numerical methods for modeling flows in fractured media  
*Chernyshenko A.Y. (Russia, Moscow, Institute of Numerical Mathematics Russian Academy of Sciences)*
- 15:40-16:00 Optimization criteria in production scheduling models  
*Chernenko A.A. (Russia, Maikop, LLC ITV Group)*
- 16:05-16:25 Analysis of resistance to morphological transformations of visible DWM on static images  
*Alieva M.F., Aliev M.V. (Russia, Maikop, ASU)*

## Section Computer Science, Data Analysis and Information Processing

*(headed by Buchatsky P.Yu.)(Main building of ASU, room327)*

- 14:00-14:20 Information systems architecture analysis of distance education centers  
*Taran V.N., Nikolenko M.B. (Russia, Yalta, Humanitarian-Pedagogical Academy (branch)  
"Vernadskiy V.I. Crimean Federal University" in Yalta)*
- 14:25-14:45 To the question on the privacy protection with regard to automatic  
personal data processing in the state information systems  
*Kizdermishov A.A. (Russia, Maikop, ASU)*
- 14:50-15:10 Math tools for Internet of Things: at the edge and beyond  
*Dovgal V.A. (Russia, Maikop, Maikop State Technological University)*
- 15:15-15:35 Mathematical support of the geoinformation system of analysis of the tectonic stresses  
*Korobkov V.N. (Russia, Maikop, ASU)*
- 15:40-16:00 Decision support system based on multivariate statistical analysis  
*Pelipenko, E.Y. (Russia, Krasnodar, Kuban State Technological University)*
- 16:05-16:25 Modeling of dynamic processes in Electronics Vorkbench using the Lorenz system  
*Mamiy A.R. (Russia, Maikop, ASU)*

## Scientific-popular lectures for university students and high-school students

### **Saturday, October 21**

- 16:00 Mathematics and Art  
*Musatov D.V., (Russia, Moscow, MIPT)*  
*(Conference Hall of the Adygea Regional SMNS for Younger Students, Sovetskaya str.180)*
- 17:15 Meeting with students "How did I come to mathematics?"  
*Gaifullin A.A. (Doctor of Physics and Mathematics (PhD), Corresponding Member of RAS, Russia, Moscow, MSU)*  
*Karasev R.N. (Doctor of Physics and Mathematics, Federal Professor, Russia, Moscow, MIPT)*  
*(Conference Hall of the Adygea Regional SMNS for Younger Students, Sovetskaya str. 180)*

### **Sunday, October 22**

- 10.00 Borsuk's problem.  
*Raigorodskii A.M. (Doctor of Physics and Mathematics, Federal Professor, Russia, Moscow, MIPT)*  
*(Main building of ASU, room 327)*

### **Monday, October 23**

- 14.00 Flexible polyhedra and forging bellows  
*Gaifullin A.A. (Russia, Moscow, Steklov Mathematical Institute of RAS, Moscow, Russia., Lomonosov  
MSU)*  
*(Conference Hall of the Adygea Regional SMNS for Younger Students, Sovetskaya str. 180)*
- 15.00 Meeting with students. "What does it mean to be a physicist today?"  
*Koval P G. (Spain, San Sebastián, Donostia International Physics Center)*  
*(Conference Hall of the Adygea Regional SMNS for Younger Students, Sovetskaya str. 180)*
- 16:00 "The operating principle of quantum information systems".  
*Giedke Geza (Prof. Dr., Spain, San Sebastián, Donostia International Physics Center)*  
*(Conference Hall of the Adygea Regional SMNS for Younger Students, Sovetskaya str. 180)*
- 17.00 Mathematics around us.  
*Savvateev A.V. (д.ф.-м.н., Russia, Moscow, MIPT, Dmitry Pozharsky University)*  
*(Assembly hall of the main building of ASU, Pervomayskaya str., 208)*