International Conference
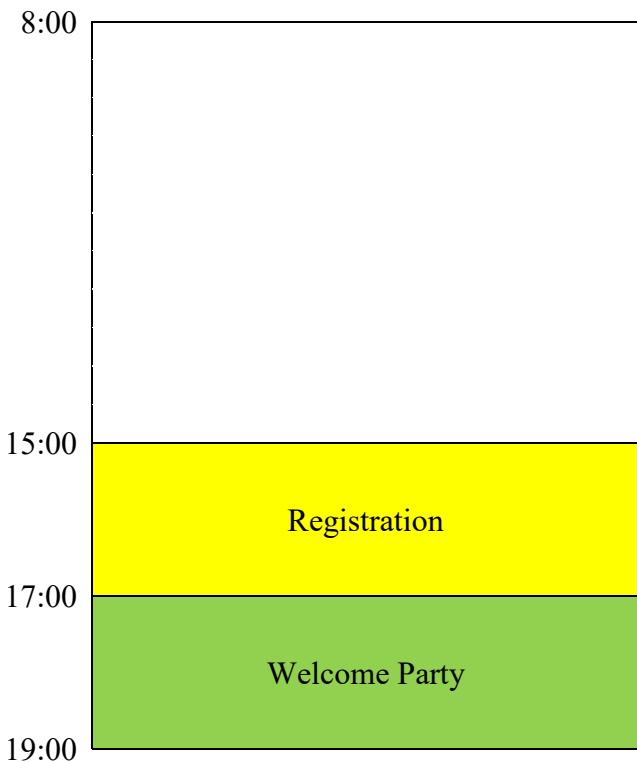
"Physics and Control 2019"

September 8-11, 2019, Innopolis, Russia
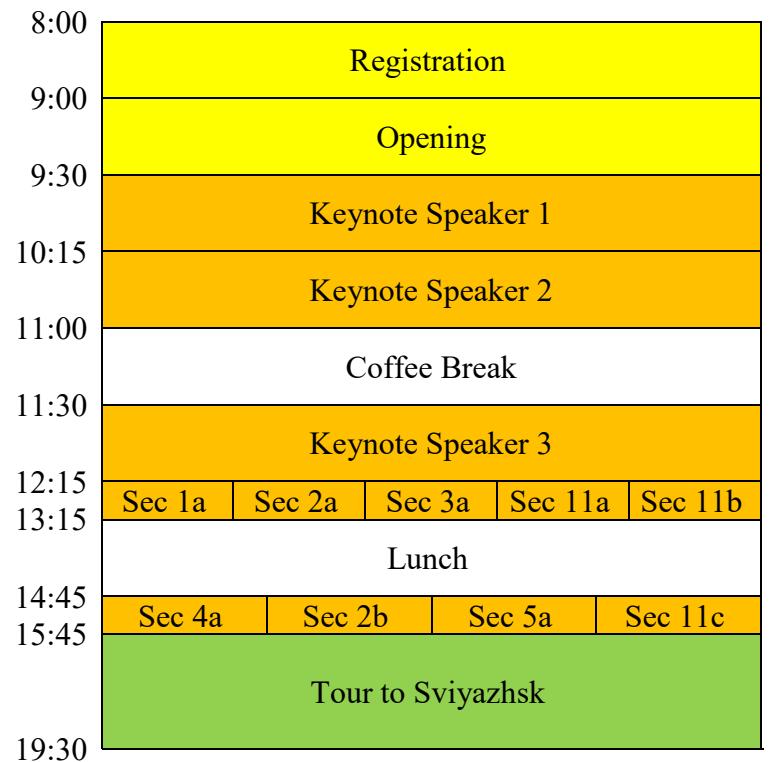
General Chair Prof. Alexander Hramov

- **Conference Program Overview**
- **Keynote Speakers**
- **Conference Program**
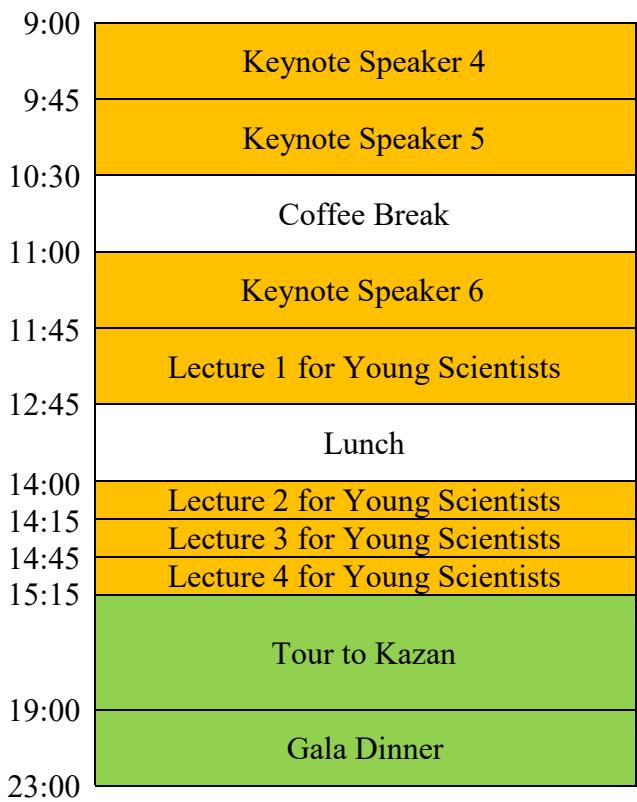
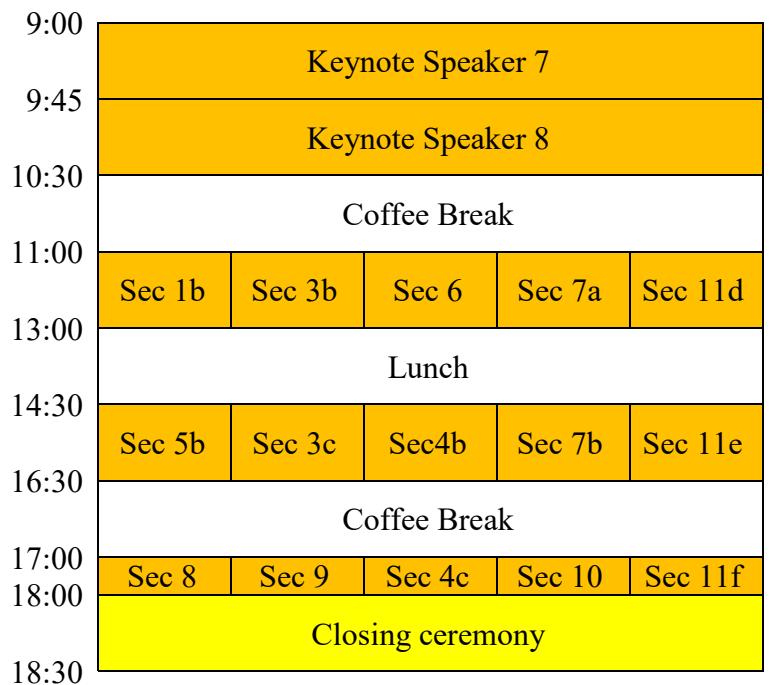# PhysCon 2019 - Preliminary Technical Program Overview

September 8, Sunday

Time	Event
8:00 – 15:00	
15:00 – 17:00	Registration
17:00 – 19:00	Welcome Party

September 9, Monday

Time	Event
8:00 – 9:00	Registration
9:00 – 9:30	Opening
9:30 – 10:15	Keynote Speaker 1
10:15 – 11:00	Keynote Speaker 2
11:00 – 11:30	Coffee Break
11:30 – 12:15	Keynote Speaker 3
12:15 – 13:15	Sec 1a / Sec 2a / Sec 3a / Sec 11a / Sec 11b
13:15 – 14:45	Lunch
14:45 – 15:45	Sec 4a / Sec 2b / Sec 5a / Sec 11c
15:45 – 19:30	Tour to Sviyazhsk

September 10, Tuesday

Time	Event
9:00 – 9:45	Keynote Speaker 4
9:45 – 10:30	Keynote Speaker 5
10:30 – 11:00	Coffee Break
11:00 – 11:45	Keynote Speaker 6
11:45 – 12:45	Lecture 1 for Young Scientists
12:45 – 14:00	Lunch
14:00 – 14:15	Lecture 2 for Young Scientists
14:15 – 14:45	Lecture 3 for Young Scientists
14:45 – 15:15	Lecture 4 for Young Scientists
15:15 – 19:00	Tour to Kazan
19:00 – 23:00	Gala Dinner

September 11, Wednesday

Time	Event
9:00 – 9:45	Keynote Speaker 7
9:45 – 10:30	Keynote Speaker 8
10:30 – 11:00	Coffee Break
11:00 – 13:00	Sec 1b / Sec 3b / Sec 6 / Sec 7a / Sec 11d
13:00 – 14:30	Lunch
14:30 – 16:30	Sec 5b / Sec 3c / Sec4b / Sec 7b / Sec 11e
16:30 – 17:00	Coffee Break
17:00 – 18:00	Sec 8 / Sec 9 / Sec 4c / Sec 10 / Sec 11f
18:00 – 18:30	Closing ceremony

Keynote Speakers

Keynote Speech 1: Predictability of extreme climate events via a complex network approach
Jürgen Kurths (Humboldt University, Berlin, Germany)

Keynote Speech 2: Systems biology of ageing: dynamics, nonlinearity, and stochasticity
Claudio Franceschi (IRCCS Institute of Neurological Sciences Bologna and University of Bologna, Italy)

Keynote Speech 3: Collective states of networked phase oscillators: explosive synchronization, dynamically interdependent networks and Bellerophon states
Stefano Boccaletti (ISC-Institute for Complex Systems, Italy)

Keynote Speech 4: Dynamics of oscillatory networks: from simple to complex links
Vladimir Nekorkin (Inst. Of Appl. Phys., Nizhny Novgorod, Russia)

Keynote Speech 5: Cybernetical physics and cyber-physical systems
Alexander Fradkov (Inst. for Problems of Mech. Eng., St. Petersburg, Russia)

Keynote Speech 6: Tipping phenomena and resilience: two sides of the same coin?
Ulrike Feudel (Carl von Ossietzky Universität Oldenburg, Oldenburg, Germany)

Keynote Speech 7: Partial synchronization patterns in complex networks - interplay of dynamics, time delay, and network topology
Eckehard Schöll (Technische Universität, Berlin, Germany)

Keynote Speech 8: Development of brain computer interfaces for the interruption and prevention of epileptic seizures
Annika Lüttjohann (University of Münster, Münster, Germany)

Lectures for Young Scientists

Lecture 1: Spectral and wavelet approaches for revealing state transitions from individual trajectories
Eugene Postnikov (Kursk State University, Kursk, Russia)

Lecture 2: Philosophical Aspects of Artificial Intelligence
Vasiliy Kuznetsov (Goethe-Institut, Moscow, Russia)

Lecture 3: Application of machine learning to modeling of nonlinear hydromechanical systems
Leonid Savin, Alexey Kornaev (Orel State University, Orel, Russia)

Lecture 4: Intellectual collaborative robotics in medicine: problems and solutions
Yury Poduraev (Moscow State University of Technology "STANKIN", Moscow, Russia)

Sections

Sec 1a, Sec 1b	Dynamics and Control of Systems with Time Delays
Sec 2a, Sec 2b	Synchronization of Regulatory Processes in the Cardiovascular and Neuronal Systems
Sec 3a, Sec 3b, Sec 3c	Chaotic and Complex Dynamics and its Applications
Sec 4a, Sec 4b, Sec 4c	Interdisciplinary Issues of Control
Sec 5a, Sec 5b	Robotics, Mechatronics and Control
Sec 6	Brain-Computer Interfaces
Sec 7a, Sec 7b	Complex Networks and Biosystems
Sec 8	Dynamics and Control of Self-Driven Cars

September 9, Monday		
9.00-9.30 – Opening of the Conference: **Opening speech of Prof. Alexander Hramov** (*Innopolis University, Innopolis, Russia)*, **Prof. Alexander Tormasov** (*Rector of Innopolis University, Innopolis, Russia)*, **Prof. Alexander Fradkov** (*Inst. for Problems of Mech. Eng., St. Petersburg, Russia)* **Alexander Semenov** (*NeuroNet Industry Union, Moscow, Russia)*: NeuroNet: goals and objectives of the development of neurotechnology in Russia		
Time	**Speaker**	**Title of talk**
9.30-10.15	**Prof. Jürgen Kurths** *Humboldt University, Berlin, Germany*	Predictability of extreme climate events via a complex network approach
10.15-11.00	**Prof. Claudio Franceschi** *IRCCS Institute of Neurological Sciences Bologna and University of Bologna, Italy*	Systems biology of ageing: dynamics, nonlinearity, and stochasticity
11:00-11:30	*Coffee Break*	
11.30-12.15	**Prof. Stefano Boccaletti** *ISC-Institute for Complex Systems, Italy*	Collective states of networked phase oscillators: explosive synchronization, dynamically interdependent networks and Bellerophon states
12:15-13:15	**Section 1a "Dynamics and Control of Systems with Time Delays"** *Dr. Anna Zakharova; Dr. Vladimir Klinshov*	
12:15-12:30	J. Sawicki, I. Omelchenko, A. Zakharova, E. Schöll	Delay-controlled relay synchronization in multiplex networks
12:30-12:45	S. Yanchuk, S. Ruschel, J. Sieber, M.Wolfrum	Temporal dissipative solitons in time-delay feedback systems
12:45-13:00	S. Tomashevich	Method of controls synthesis for multiagent system with time-varying delays in information channels
13:00-13:15	N. Semenova, A. Zakharova	Noise induced regimes in network of excitable elements. Topology, noise and time-delayed feedback
12:15-13:15	**Section 2a "Synchronization of Regulatory Processes in the Cardiovascular and Neuronal Systems"** *Prof. Mikhail Prokhorov*	
12:15-12:30	M.D. Prokhorov, D.D. Kulminskiy, V.I. Ponomarenko, A.E. Hramov	Control of synchronization in networks of nonidentical neuronlike oscillators
12:30-12:45	V.I. Ponomarenko, A.S. Karavaev, Yu.M. Ishbulatov, A.R. Kiselev,	Interaction of slow oscillatory processes in the human cardiovascular system and their mathematical modeling

	E.I. Borovkova, V.V. Skazkina, M.D. Prokhorov	
12:45-13:00	A. Karavaev, E. Borovkova, A. Kiselev, A. Runnova, V. Prokhorov, V. Ponomarenko, A. Hramov, V. Gridnev, B. Bezruchko	Interactions between the processes of regulation of the cardiovascular system and the brain structures
13:00-13:15	A. Karavaev, A. Kiselev, E. Borovkova, Y. Popova, V. Gridnev, O. Posnenkova	Dynamics of low-frequency components of photoplethysmogram signals in hypertension
12:15-13:15	**Section 3a "Chaotic and Complex Dynamics and its Applications"** *Prof. Syamal Dana; Prof. Elbert Macau*	
12:15-12:30	A. Mishra, C. Hens, S. Dana	Chimeralike states in a network of oscillators under attractive and repulsive global coupling
12:30-12:45	S. Saha, N. Bairagi, S.K. Dana	Emergence of amplitude mediated chimera states in ecological network under weighted mean-field dispersal
12:45-13:00	V.A. Gaiko	Limit cycles of a Topp system
13:00-13:15	N.V. Kuznetsov, T.N. Mokaev, A. Prasad, M.D. Shrimali, B.K. Roy	Hidden attractors and Lyapunov dimension
12:15-13:35	**Section 11a "Dynamics of Complex Networks and their Application in Intellectual Robotics"** *Dr. Nikita Frolov*	
12:15-12:25	V.V. Skazkina, E.N. Mureeva, A.S. Karavaev, A.R. Kiselev, E.I. Borovkova, O.S. Panina, Yu.M. Ishbulatov, Y.V. Popova	Choosing parameters for the analysis of synchronization of the autonomic regulatory contours of blood circulation in newborns
12:25-12:35	V.V. Skazkina, Yu.M. Ishbulatov, E.I. Borovkova, B.P. Bezruchko, A.R. Kiselev, A.S. Karavaev	Slow trends in the degree of synchronization of the elements of autonomous control of blood circulation in healthy subjects
12:35-12:45	E.I. Borovkova, Yu.M. Ishbulatov, A.R. Kiselev, A.V. Tankanag, G.V. Krasnikov, A.S. Karavaev	Synchronization of the process of autonomous regulation of blood circulation with low-frequency components of the laser Doppler flowmetry signal
12:45-12:55	E.I. Borovkova, E.P. Chernets, Yu.M. Ishbulatov, V.V. Skazkina, A.S. Karavaev	Experimental observation of Arnold tongues in the analysis of the signal from contour of the autonomous regulation of heart rate and respiration
12:55-13:05	Yu.M. Ishbulatov, E.I. Borovkova, A.S. Karavaev, A.R. Kiselev, B.P. Bezruchko	Comparing methods for extraction of autonomic control signals from electrocardiogramm
13:05-13:15	E.V. Navrotskaya, M.V. Sinkin, A.N. Khramkov, D.M. Yezhov, B.P. Bezruchko	Development of a method for coupling detection based on the phase dynamics modeling for analyzing EEG rhythms

		during an epileptic seizure in patients with a reduced level of consciousness
13:15-13:25	A. Badarin	Development of a digital software platform for the study of nonlinear dynamics of electronic systems
13:25-13:35	V.B. Baiburin, A.S. Rozov	Poisson equation numerical solution method based on bidirectional multiple passage of grid cells and parallel computations
12:15-13:45	**Section 11b "Dynamics of Complex Networks and their Application in Intellectual Robotics"** *Prof. Semen Kurkin*	
12:15-12:25	A.A. Grishchenko, T.M. Medvedeva, C.M. van Rijn, M.V.Sysoeva, I.V. Sysoev	Application of directed connectivity measures for identifying the evolution of the interaction structure in WAG/Rij rats brain at absence epilepsy
12:25-12:35	V. Khorev, M. Zhuravlev, E. Borovkova, A. Hramov, Yu. Ishbulatov, V. Gridnev, A. Karavaev	Asymmetry of coupling between the P3 and P4 electroencephalographic leads during the motions
12:35-12:45	A.V. Kochetkov, D.R. Malakhov, O.V. Zakharov	Optimization approach for inverse kinematic problem for manipulator with redundant degrees of freedom
12:45-12:55	A.V. Kochetkov, P.M. Salov, O.V. Zakharov	Route optimization in measuring surfaces on coordinate measuring machines
12:55-13:05	E. Pitsik, N. Frolov	Time-frequency and recurrence quantification analysis detect limb movement execution from EEG data
13:05-13:15	A.R. Miftahova, A.E. Hramov	Reccurence plot analysis of functional brain connectivity during bistable visual perception
13:15-13:25	A. Andreev, A. Pisarchik	Modeling of a brain neuronal network under visual stimulation
13:25-13:35	A. Andreev, V. Makarov, A. Balanov, A. Hramov	Chaos and hyperchaos in a chain of coupled Rydberg atoms
13:35-13:45	O.N. Pavlova, N.M. Kupriyashkina, A.N. Pavlov	Characterization of intermittent dynamics from experimental data with DFA
13.15-14.45	*Lunch*	
14:45-15:45	**Section 4a "Interdisciplinary Issues of Control"** *Prof. Alexander Hramov; Prof. Alexander Pisarchik*	
14:45-15:15	**Prof. Eugene Postnikov** *Kursk State University, Kursk, Russia*	**Invited Talk** Quantitative thermodynamics of liquids: a fluctuational approach to the practical predicting liquids' properties under high pressures

15:15-15:30	A. Oshchepkov	Robust stabilization system of qubit based on spin ½ in a magnetic field
15:30-15:45	Tun Lin Aung, V. Mikhailov, A. Bazinenkov, A. Kopylov, D. Tovmachenko	Study of an active vibration isolation device for the nanopositioning based on MR elastomers
14:45-15:30	**Section 2b "Synchronization of Regulatory Processes in the Cardiovascular and Neuronal Systems"** *Prof. Mikhail Prokhorov*	
14:45-15:00	M.A. Simonyan, A.S. Karavaev, Y.M. Ishbulatov, V.V. Skazkina, V.I. Gridnev, B.P. Bezruchko, A.R. Kiselev	Directional coupling between the low-frequency control of heart rate and vessels tone in myocardial infarction patients
15:00-15:15	S. Salem, V. Tuchin	Theoretical study for a mixture from magnetic microcapsule suspensions and blood under magnetic field effect
15:15-15:30	S. Salem, V. Tuchin	Numerical simulation for blood flow in a tube under magnetic field effect
14:45-15:45	**Section 5a "Robotics, Mechatronics and Control"** *Dr. Alexandr Klimchik*	
14:45-15:00	L. Vorochaeva, A. Yatsun, S. Savin, A. Repkin	Development of the motion correction system of the crawling robot link on the surface with obstacles
15:00-15:15	V. Erofeeva, O. Granichin, I. Len	Sparsity-promoting sensor selection in multi-target tracking problem
15:15-15:30	A. Andreev, K. Sutyrkina	On the control problem of a two-link manipulator
15:30-15:45	E. L. Eremin, E. A. Shelenok	Simulation modeling of the decentralized robust-periodic control system for manipulator with input constraints
14:45-15:45	**Section 11c "Dynamics of Complex Networks and their Application in Intellectual Robotics"** *Dr. Vladimir Maksimenko*	
14:45-14:55	A.K. Alimuradov, A.Yu. Tychkov, P.P. Churakov	A method for noise-robust speech signal processing to assess human psycho-emotional state
14:55-15:05	A.K. Alimuradov, A.Yu. Tychkov, P.P. Churakov	A novel approach to speech signal segmentation based on empirical mode decomposition to assess human psycho-emotional state
15:05-15:15	A. Tychkov, A. Alimuradov, P. Churakov	The empirical mode decomposition for ECG signal preprocessing
15:15-15:25	A. Petukhov	Modeling the distortions of public opinion under conditions of external influence using differential stochastic equations
15:25-15:35	V. Khorev	Mean phase coherence modified for piecewise constant phase difference data

15:35-15:45	N. Frolov, A. Hramov	Multilayer perceptron reveals functional connectivity structure in thalamo-cortical brain network

September 10, Tuesday

Time	Speaker	Title
9.00-9.45	**Prof. Vladimir Nekorkin** *Inst. Of Appl. Phys., Nizhny Novgorod, Russia*	Dynamics of oscillatory networks: from simple to complex links
9.45-10.30	**Prof. Alexander Fradkov** *Inst. for Problems of Mech. Eng., St. Petersburg, Russia*	Cybernetical physics and cyber-physical systems
10:30-11:00	*Coffee Break*	
11.00-11.45	**Prof. Ulrike Feudel** *Carl von Ossietzky Universität Oldenburg, Oldenburg, Germany*	Tipping phenomena and resilience: two sides of the same coin?
11:45-12:45	**Prof. Eugene Postnikov** *Kursk State University, Kursk, Russia*	Spectral and wavelet approaches for revealing state transitions from individual trajectories
12.45-14.00	*Lunch*	
14:00-14:15	**Dr. Vasiliy Kuznetsov,** *Goethe-Institut, Moscow, Russia*	Philosophical Aspects of Artificial Intelligence
14.15-14.45	**Prof. Leonid Savin, Prof. Alexey Kornaev** *Orel State University, Orel, Russia*	Application of machine learning to modeling of nonlinear hydromechanical systems
14.45-15.15	**Prof. Yury Poduraev** *Moscow State University of Technology "STANKIN", Moscow, Russia*	Intellectual collaborative robotics in medicine: problems and solutions

September 11, Wednesday

Time	Speaker	Title
9.00-9.45	**Prof. Eckehard Schöll** *Technische Universität, Berlin, Germany*	Partial synchronization patterns in complex networks - interplay of dynamics, time delay, and network topology
9.45-10.30	**Dr. Annika Lüttjohann** *University of Münster, Münster, Germany*	Development of brain computer interfaces for the interruption and prevention of epileptic seizures
10:30-11:00	*Coffee Break*	

11:00-13:00	**Section 1b "Dynamics and Control of Systems with Time Delays"** _Dr. Anna Zakharova; Dr. Vladimir Klinshov_	
11:00-11:15	I. Franović and V. Klinshov	Emergence of collective oscillations in assemblies of stochastic active elements with coupling delay
11:15-11:30	O. D'Huys V.V. Klinshov	Mode hopping in a pulse-coupled oscillator with delayed feedback
11:30-11:45	R. Giusteri, G. Russano, H. Inchauspe, M. Armano	LISA-pathfinder free-fall experiments, platform stability and drag-free performance
11:45-12:00	A. Karavaev, A. Kiselev, E. Borovkova, Y. Ishbulatov	Dynamics of mathematical model of cardio-vascular system
12:00-12:15	I. Kashchenko	The dynamics of logistic equation with two delays
12:15-12:30	N. Sedova	On uniform asymptotic stability for nonlinear integro-differential equations of Volterra type
12:30-12:45	A. Kashchenko	Dependence of dynamics of two delayed generators on the strength of coupling
12:45-13:00	V.N. Chizhevsky, S.A. Kavalenka	Effect of optical feedback on multistability in a multimode VCSEL
11:00-13:00	**Section 3b "Chaotic and Complex Dynamics and its Applications"** _Prof. Syamal Dana; Prof. Elbert Macau_	
11:00-11:15	R. Jaimes-Reátegui, J.M. Reyes-Estolano, J.H. García-López, G. Huerta Cuellar, A. Gallegos, A.N. Pisarchik	Hindmarsh-Rose neuron response to laser stimulation
11:15-11:30	G. Huerta-Cuellar, J.L. Echenausía-Monroy, R. Jaimes-Reátegui, J.H. García-López, H. E. Gilardi-Velázquez	Intermittency and hidden fixed points induced in a bistable multiscroll attractor by means of stochastic modulation
11:30-11:45	S.N. Chowdhury, D. Ghosh, C. Hens	Optimal Frustration in complex networks
11:45-12:00	J. Lacerda, C. Freitas, E. Macau	Second order Kuramoto networks: topologies that favor synchronization
12:00-12:15	P. Khanra, P. Kundu, C. Hens, P. Pal	Explosive synchronization in adaptive complex networks with phase-frustration
12:15-12:30	T. Kapitaniak	Traveling chimera states for coupled
12:30-12:45	S.L. Kingston, K. Thamilmaran, T. Kapitaniak	Supertransient chaos in forced Liénard system
12:45-13:00	A.Y. Petukhov	Modeling of threshold effects in social systems based on nonlinear dynamics
11:00-13:30	**Section 6 "Brain-Computer Interfaces"** _Dr. Annika Lütjohann_	
11:00-11:30	**Prof. Mikhail Lebedev**	**Invited Talk** TBA

	Higher School of Economics, Moscow, Russia Duke University, Durham, USA	
11:30-11:45	P. Chholak, A.N. Pisarchik, S.A. Kurkin, V.A. Maksimenko, A.E. Hramov	Neuronal pathway and signal modulation for motor communication
11:45-12:00	V. Maksimenko, V. Grubov	Cognitive interaction during a collaborative attentional task
12:00-12:15	V. Grubov, V. Maksimenko	Features of brain activity in children during cognitive tasks of different types
12:15-12:30	V. Grubov, N. Frolov, E. Pitsik, A. Badarin	Features of real and imaginary motor activity on EEG and fNIRS signals
12:30-12:45	V. Khorev, M. Zhuravlev, E. Borovkova, A. Hramov, Y. Ishbulatov, V. Gridnev, A. Karavaev	Asymmetry of coupling between the P3 and P4 electroencephalographic leads during the motions
12:45-13:00	E. Pitsik, N. Frolov, A. Hramov	Network analysis of brain activity during real motor actions execution using recurrence-based measure of dependence
13:00-13:15	A. Hramov, A. Kiselev, N. Schykovskii	Post-stroke rehabilitation with the help of brain-computer interface
13:15-13:30	A. Hramov, A. Pisarchik	Kinesthetic and visual modes of imaginary movement: MEG studies for BCI development
11:00-12:45	**Section 7a "Complex Networks and Biosystems"** *Prof. Mikhail Ivanchenko*	
11:00-11:15	S. Gordleeva, O. Kanakov, A. Zaikin	Garbage induced model of inflammation propagation
11:15-11:30	M. Krivonosov, M.G. Bacalini, S. Jalan, C. Franceschi, M. Ivanchenko	Down syndrome: footprint in parenclitic networks of DNA methylation
11:30-11:45	V. Lynnyk, B. Rehak, S. Celikovsky	On applicability of auxiliary system approach in complex network with ring topology
11:45-12:00	A. Dmitrichev, V. Nekorkin	Structural stability of chimera states cloning in a large non-stationary coupled two-layer multiplex network of bistable relaxation oscillators
12:00-12:15	T. Nazarenko, M. Krivonosov, A. Zaikin	Analysis of longitudinal high-dimensional medical data with parenclitic networks
12:15-12:30	B. Brister, V.N. Belykh, I. Belykh	Multistable cluster rhythms in networks of coupled rotators
12:30-12:45	B. Rehak, V. Lynnyk	Design of a nonlinear observer using the finite element method with application to a biological system
11:00-13:20	**Section 11d "Dynamics of Complex Networks and their Application in Intellectual Robotics"** *Prof. Vladimir Ponomarenko*	

11:00-11:10	A. Kornaev, R. Zaretsky, S. Egorov	Simulation of deep learning control systems to reduce energy loses due to vibration and friction in rotor bearings
11:10-11:20	M.V. Bobyr, A.S. Yakushev, N.A. Milostnaya	Three-coordinate definition of color mark and distance to objects according to stereo image
11:20-11:30	N. Fadeeva, A. Gulai, S. Astakhov	Amplitude-phase dynamics of the three-mode cross-coupled generator
11:30-11:40	D. Artyukhov, I. Artyukhov, V. Alekseev, I. Burmistrov	Using thermoelectrics for power supplying of wireless sensors network
11:40-11:50	A. Makashov	The network layer model of the wireless sensor network acting under the influence of interferences
11:50-12:00	A. Kirpichnikov, A. Titovtsev	Practical recommendations on the application of Markov queuing models with a restricted queue
12:00-12:10	V.A.-jr. Krysko, T.V. Yakovleva, V.A. Krysko	Theory of contact interaction of inhomogeneous beam-lamellar nanostructures taking into account the connectivity of the temperature and deformation fields
12:10-12:20	I.V. Papkova, A.V. Krysko, E.Yu. Krylova	Mathematical modeling of NEMS elements in the form of flexible round plates under the Casimir's force action
12:20-12:30	E.Yu. Krylova, I.V. Papkova, O.A. Saltykova, V.A. Krysko	Mathematical modeling of the behavior of flexible micropolar mesh cylindrical panels with two sets of mutually orthogonal rods
12:30-12:40	O.A. Saltykova, V.A. Krysko	Nonlinear dynamics of a flexible closed cylindrical size-dependent shell under the action of a band load
12:40-12:50	A. Kuc, V. Maksimenko	Spatio-temporal cortical activity during a visual task accomplishing
12:50-13:00	A.M. Vaskovsky, M.S. Chvanova	Designing the neural network for personalization of food products for persons with genetic president of diabetic sugar
13:00-13:10	S. Kurkin, P. Chholak, V. Maksimenko, A. Pisarchik	Machine learning approaches for classification of imaginary movement type by MEG data
13:10-13:20	S. Kurkin, V. Maksimenko, E. Pitsik	Approaches for the improvement of motor-related patterns classification in EEG signals
13.00-14.30	*Lunch*	
14:30-16:15	**Section 5b "Robotics, Mechatronics and Control"** *Dr. Alexandr Klimchik*	

14:30-14:45	O. Kiselev	Stabilization of inverted wheeled pendulum
14:45-15:00	Teturo Itami, Nobuyuki Matsui, Teijiro Isokawa	Dissipative systems as optimal control systems with input in special form of feedback law
15:00-15:15	V. Iluhin, V. Dubovitskih, D. Mezentsev	Workspace of manipulator of robot AR600E
15:15-15:30	V.A. Serov, E.M. Voronov, A.B. Borisov, D.A. Kozlov	Multi-criteria neuro-evolutionary synthesis of the combined trajectory parameters adaptation laws for the unmanned aerial vehicle stabilization system
15:30-15:45	S.A. Kochetkov, A.S. Antipov, S.A. Krasnova	Stabilization of the convey-crane position under the conditions of uncertainty
15:45-16:00	E. Parsheva, G. Ternovaja	Robust output control of multi-agent plants with state delay
16:00-16:15	M. Demenkov	Arduino-based investigation of hysteresis in polymer flex sensor
14:30-16:45	**Section 3c "Chaotic and Complex Dynamics and its Applications"** *Prof. Syamal Dana; Prof. Elbert Macau*	
14:30-14:45	P. Pal, M. Ghosh	First order transition in rotating magnetoconvection
14:45-15:00	T.A. Khantuleva, D.S. Shalymov	SG-principle and special features of the short-duration processes
15:00-15:15	N. Barabash, V. Belykh	Ghost attractors in the non-autonomous blinking systems
15:15-15:30	V.B. Smirnova, A.V. Proskurnikov, N.V. Utina	The problem of cycle-slipping for synchronization systems with external disturbances
15:30-15:45	I. Denisov, A. Sonin	Seismic-acoustic signal generation model from fiber-optical measuring lines for neural-like classifier
15:45-16:00	M.V. Shamolin	Mathematical modeling of the spatial action of a medium on a body of conical form
16:00-16:15	Chunbiao Li; Tianai Lu	A chaotic system: from conditional symmetry to symmetry
16:15-16:30	P. Petrenko, O. Samsonyuk, M. Staritsyn	A note on differential-algebraic systems with impulsive and hysteresis phenomena
16:30-16:45	I. Yusipov, M. Ivanchenko, S. Denysov	Neimark-sacker bifurcation in periodically modulated open quantum dimer
14:30-16:30	**Section 4b "Interdisciplinary Issues of Control"** *Prof. Alexander Hramov; Prof. Alexander Pisarchik*	
14:30-14:45	Yongdong Cheng, Jun Jiang	Control methods to enhance pointing accuracy of an antenna servo system on a carrier under large disturbance

14:45-15:00	M. Isabel Garcia-Planas	Analyzing controllability and observability of multi-agent linear systems
15:00-15:15	A. Chanes Espigares, M. Isabel Garcia-Planas	Exact controllability of linear Hamiltonian control systems
15:15-15:30	S. Haider, U. Saeed	Explosive material detection and security alert system
15:30-15:45	V. Serov, E. Voronov, A. Erohin	Coordinated stable-effective compromise based hierarchical game model of system-ecological safety level prediction under anthropogenic impact
15:45-16:00	C. Romero-Meléndez, L. González-Santos	Stochastic optimal control applied to a two-level quantum system
16:00-16:15	S. Sorokin, M. Staritsyn	Numerical algorithms for state-linear optimal impulsive control problems based on feedback necessary optimality conditions
16:15-16:30	I. Halperin, G. Agranovich, Yu. Ribakov	Implementation of Krotov's method for a type of constrained bilinear quadratic optimization problem
14:30-16:15	**Section 7b "Complex Networks and Biosystems"** *Prof. Mikhail Ivanchenko*	
14:30-14:45	S. Jalan, V. Rathore, A.D. Kachhvah, A. Yadav	Multiplexing with inhibitory layer leading to explosive synchronization in multiplex networks
14:45-15:00	I.P. Mariño, L. Lacasa, J. Míguez, V. Nicosia, É. Roldán, A. Lisica, S.W. Grill, J. Gómez-Gardeñes	Identifying the hidden multiplex architecture of biological processes
15:00-15:15	S. Makovkin, M. Ivanchenko, A. Zaikin, S. Jalan	Investigating multiplex models of neuron-glial systems: small-world topology and inhibitory coupling
15:15-15:30	O. Vershinina, S. Denisov, M. Ivanchenko	Quasi-stationary oscillations in game-driven evolutionary dynamics
15:30-15:45	A. Kalyakulina, I. Yusipov, O. Vershinina, M. Ivanchenko, C. Franceschi	Nonlinearity and stochasticity of age-related sex-specific methylation changes
15:45-16:00	M. Krivonosov, M. Ivanchenko, S. Jalan, M.G. Bacallini, C. Franceschi	Parenclitic analysis of high-dimensionality DNA methylation data
16:00-16:15	A. Makeeva, A. Dmitrichev, V. Nekorkin	Torus canards in the ensemble synaptically related neurons Fitzhugh-Nagumo
14:30-16:40	**Section 11e "Dynamics of Complex Networks and their Application in Intellectual Robotics"** *Dr. Anatoly Karavaev*	
14:30-14:40	M. Rassabin, R. Yagfarov, S. Gafurov	Approaches for road lane detection
14:40-14:50	S. Mikhel	State-based velocity profile for manipulator

14:50-15:00	V. Skvortsova, D. Popov	Design of the parallel spherical manipulator for wrist rehabilitation
15:00-15:10	R. Khusainov, S. Mamedov, P. Dmitry	Trajectory planning for biped walk with
15:10-15:20	A. Evlampev, M. Ostanin	Non-instantaneous double support phase
15:20-15:30	P. Khakimov, S. Savin, A. Klimchik	Obstacle avoidance for robotic manipulator using mixed reality glasses
15:30-15:40	I.D. Galushko, G.M. Makaryants, S.A. Gafurov	Mathematical modeling of changes in geometric parameters of pneumatic muscles
15:40-15:50	A. Kurbanov, S. Grebennikov, S. Gafurov, A. Klimchik	Vulnerabilities in the vehicle's electronic network equipped with ADAS system
15:50-16:00	R. Yagfarov, V. Ostankovich, S. Gafurov	Augmentation-based object detection for winter time applications
16:00-16:10	T.I. Muftakhov, V.M. Giniyatullin, D.V. Shekhovtsov	Interpretation of the results of the neural network after the substitution of continuous activation function on the threshold function
16:10-16:20	N. Stankevich, E. Volkov, E. Hellen	Self-organized quasiperiodicity and multistability in dynamical systems of different nature
16:20-16:30	E. Bagautdinova, S. Kuznetsov, E. Seleznev, N. Stankevich	Circuit simulation of a blue sky catastrophe in the context of bursting dynamics occurrence
16:30-16:40	G.Y. Prokudin, N.G. Sharonov, E.S. Briskin	Optimal control of orthogonal-rotary movers of walking robot with an excessive number of drives
16:30-17:00	*Coffee Break*	
17:00-18:00	**Section 8 "Dynamics and Control of Self-Driven Cars"** *Dr. Salimzhan Gafurov*	
17:00-17:15	R. Chertovskih, N.T. Khalil, F.L. Pereira	Optimal path planning of AUVs operating in flows influenced by tidal currents
17:15-17:30	A. Andreev, O. Peregudova, K. Sutyrkina	On global trajectory tracking control of a wheeled mobile robot
17:30-17:45	A.V. Utkin, V.A. Utkin	Synthesis of control systems at unilateral limitations on controls and their derivatives
17:45-18:00	A.V. Utkin, J.G. Kokunko, D.V. Krasnov	Synthesis of the subsystem of observation for an unmanned aerial vehicle under uncontrolled disturbances
17:00-17:45	**Section 9 "Self-Organization and Complexity in Brain Circuits"** *Prof. Dmitry Postnov*	
17:00-17:15	D. Zakharov, M. Krupa, B. Gutkin	Modulation of synchronous gamma rhythm clusters

Time	Authors	Title
17:15-17:30	A. Sergeenko, O. Granichin, M. Yakunina	Hamiltonian path problem: the time consumption comparison of DNA computing and branch and bound method
17:30-17:45	S.A. Plotnikov, D.R. Belov	Simulation of gamma rhythm and its correlation with low-frequency signals
17:00-17:45	**Section 4c "Interdisciplinary Issues of Control"** *Prof. Alexander Hramov; Prof. Alexander Pisarchik*	
17:00-17:15	O. Starinova, I. Chernyakina	The effects of surface degradation on ballistics of Solar sail mission to the Sun
17:15-17:30	P.A. Velmisov, A.V. Ankilov	Investigation of dynamics and stability of elastic elements of vibration devices
17:30-17:45	V. Erofeeva, V. Galyamina, K. Gonta, O. Granichin, A. Leonova, V. Pankov, M. Tursunova, Mingyue Ding, Ming Yuchi, Xiaoyue Fang	Detection of specific areas with ultrasound tomography
17:00-18:00	**Section 10 "Emerging Challenges in Autonomous Cyber-Physical Systems"** *Dr. Allahyar Montazeri; Dr. Alexandr Klimchik; Dr Mohammad Reza Bahrami*	
17:00-17:15	M. Reza Bahrami, M.R. Wasilewski	Performance analysis of dynamic vibration absorber using semi-active control system for skidding tractor with an operator
17:15-17:30	A. Montazeri, Weiling Zheng	Multi-objective particle swarm optimization algorithm approach for parameter optimization of a 7 DOF robotic manipulator
17:30-17:45	H. Ahmadian, M.M. Arefi, A. Khayatian, A. Montazeri	L1 adaptive controller design for nuclear robots in the presence of loss data, time delay and uncertainty
17:45-18:00	I.V. Konyukhov, V.M. Konyukhov	Cyber-physical system for control the heat and mass transfer in the oil reservoir and producing pumping well
17:00-18:00	**Section 11f "Dynamics of Complex Networks and their Application in Intellectual Robotics"** *Dr. Vadim Grubov*	
17:00-17:10	S. Savin	Detecting changes in contact interaction regime with a reaction predictor and a linear contact model
17:10-17:20	D. Popov, A. Klimchik	Identification stiffness model parameter for bipedal robots
17:20-17:30	D. Popov, A. Klimchik	Multiple collision detection for a collaborative robot
17:30-17:40	P. Kozlov, A. Klimchik	Automated robotic assembly of complex workpieces from regular components
17:40-17:50	E.A. Marchuk, A.P. Fedin, Ya.V. Kalinin	Neuro-fuzzy anti-block braking system of the vehicle

17:50-18:00	T.A. Tarasova, I.A. Tarasova, A.V. Maloletov, Ya.V. Kalinin	Application of systems of stochastic differential equations for modeling transport processes
18.00-18.30	**Closing ceremony**	