Program of International Conference "Shilnikov Workshop 2022".

Conference organizer: Scientific and Educational Mathematics Center «Mathematics of Future Technologies»

Venue of the Conference: Lobachevsky State University of Nizhny Novgorod, 23 Gagarin ave., bldg. 2, room 331 (MathCenter audience)

December 19

9.45 Opening the Conference.

Chairman: S.Gonchenko

10.00 – 10.45   Belykh V.N., Method of invariant cones for strange attractors of Henon, Lozi and Belykh type maps.

10.45 – 11.30   Kulagin N.E., Lerman L.M., On periodically modulated rolls in the generalized Swift-Hohenberg equation.

11.30 – 12.00   Coffee-break

12.00 – 12.30 Alfimov G., Counting stationary states for NLS-type equations.

12.30 – 13.00 Morozov A.D., Morozov K.E., On degenerate resonances and synchronization.

13.00 – 13.30   Maslennikov O.V., Emelianova A.A., Nekorkin V.I., Disordered oscillation quenching in rings and chains of coupled Bautin oscillators.

Lunch

Chairman: A. Kazakov

15.00 – 15.40   Turaev D.V., Symplectic blenders.

15.40 – 16.10   Li D., Li X., Shinohara K., Turaev D.,   Robust heterodimensional cycles in two-parameter unfolding of homoclinic tangencies.

16.10 – 16.30   Coffee-break

16.30 – 17.10   Fiedler B., Parabolic Sturm global attractors: Thom-Smale complexes, Poincare duality, and time reversal.
17.10 – 17.50   Scully Jack, Bloom David, Hinsley Carter and <u>Shilnikov Andrey L.,</u> Curious chaos in the modified Plan model of the neuron R15.
17.50 – 18.20   Ovsyannikov I.I., Heat transport and periodic attractors at high Rayleigh number for Lorenz-like models.

December 20 (online sessions)

Chairman: M. Malkin

10.00 – 10.40   Grines V.Z., Topology of ambient manifolds and hyperbolic dynamics.
10.40 – 11.10   Pochinka O.V.,   Knot as a complete invariant for Morse-Smale diffeomorphisms with four fixed points.
11.10 – 11.40 <u>Minkov S.S.</u>, Okunev A.V., Shilin I.S., Attractors with non-invariant interior.
11.40 – 12.10   Medvedev V.S., <u>Zhuzhoma E.V.</u> , Codimension one basic sets of A-flows.
12.10 – 12.40   <u>Safonov K.A.</u>, Malkin M.I., Kazakov A.O, Improved conditions for existence of chaotic Lorenz and Rovella attractors

Break

Chairman: Safonov K.
13.30 — 14.00 <u>Emelianova A.A.</u>, Nekorkin V.I., Mixed dynamics in a system of two adaptively coupled nonisochronous Kuramoto oscillators.
14.00 – 14.30   <u>Barabash N.</u>, Belykh V., Belykh I., Proof of double-scroll attractor's existence.
14.30 – 15.00   Kuptsov P.V., Application of artificial neural networks for modeling of nonlinear dynamics: stiff and non-stiff systems.
15.00 – 15.30 <u>Stankevich N.V.</u>, Volkov E.I., Complex dynamics of three coupled genetic oscillators.
15.30 – 16.00 <u>Gonchenko A.S.</u>, Korotkov A.G., Samylina E.A., On reversible three-dimensional systems possessing the Lorenz attractor and the Lorenz repeller.

16.10 – 18.10   Section meetings

Section: **Bifurcations of dynamical systems.**
Chairman: S. Gonchenko

16.10 – 16.30 Trifonov K.N., Symplectic Partially Hyperbolic Automorphisms of 6-Torus.

16.30 – 16.50 Gordeeva O.V., Gonchenko S.V., Bifurcations of 2D-diffeomorphisms with a transverse homoclinic to a nonhyperbolic saddle.

16.50 – 17.10 Grechko D.A., Attractor's existence in multidimensional Henon-like map.

17.10- 17.30 Sinelshchikov D., Lax representation, linearizability and first integrals for autonomous and non-autonomous cubic nonlinear oscillators.

17.30 – 17.50 Demina M.V., Invariants and integrability of polynomial vector fields.

17.50 – 18.10 Chigarev V., Kazakov A., Pikovsky A., Attractor-repeller collision and the heterodimensional dynamics.

Section: **Applications of Dynamical systems.**
Chairman: N. Stankevich

16.10 – 16.40 Kulikov A., Kulikov D., Bifurcations of Invariant Manifolds in a Version of the Cahn-Hilliard Equation.

16.40 – 17.05 Ushakov I.V., Mishchenko M.A., Matrosov V.V., Influence of Watts-Strogatz topology on criticality in a neural network.

17.05 – 17.30 Kovaleva N.S., Matrosov V.V., Mishchenko M.A., Working memory formation in a spiking neural network.

17.30 – 17.50 Bagautdinova E.R., Shchegoleva N.A., Stankevich N.V., Family of neuron models with bistability between bursting attractor and stable steady state.

17.50 – 18.10 Rassadin A.E., New exact solutions of the KPZ equation.

Posters.

1) Gerasimova S. A., Mathematical and physical models of dynamical memristive neuronal systems.

2) Gonchenko S., Karatetskaia E., Kazakov A., Kruglov V., Conjoined Lorenz twins— a new pseudohyperbolic attractor in three-dimensional maps and flows.

3) Karatetskaia E., Quasiperiodic dynamics and multistability in models of coupled synthetic gene repressilators.

4) Korotkov A.G., Levanova T.A., Osipov G.V., Synchronous dynamics in small ensemble of nonidentical phase elements.

5) Koryakin V., Sukharev D., Homoclinic chaos in the six-dimensional Lorenz model.

6) Soldatkin K., Hyperchaotic attractors with three-positive Lyapunov exponents.

7) Zelentsov N.G., Antisymmetric diffeomorphisms and bifurcations of double conservative Henon map.