



Joint Institute for Power and Nuclear
Research – Sosny
B. I. Stepanov Institute of Physics
National Academy of Sciences of Belarus
Belarusian Republican Foundation for
Fundamental Research
Belarusian State University
Joint Institute for Nuclear Research

NONLINEAR PHENOMENA IN COMPLEX SYSTEMS

*Fractals, Chaos, Phase Transitions,
Self-organization*

Minsk, Belarus

JUNE 8 – 12, 2026

XXXIII Annual International Seminar

Program

<https://sosny.bas-net.by/npcs/ru/programme.html>

Minsk, 2026



Monday, June 8, 09.00-19.40

9.00 - 10.00 Registration
10.00 - 10.05 Opening
10.05 - 11.30 Plenary Session
11.30 - 12.00 Coffee-Break
12.00 - 13.30 Plenary Session
13.30 - 14.30 Lunch
14.30 - 16.30 Session: QED and QCD
16.30 - 17.00 Coffee-Break
17.00 - 19.00 Session: QED and QCD
19.00 – 19.40 Session: Classical and Quantum Mechanical Problems

Tuesday, June 9, 09.00-18.40

09.00 - 10.40 Session: Information theory and processing
10.40 - 11.10 Coffee-Break
11.10 - 13.00 Plenary Session
13.00 - 14.00 Lunch
14.00 - 16.20 Session: Particles
16.20 - 16.40 Coffee-Break
16.40 - 18.40 Session: Quantum Mechanical Problems and
Mathematics

Wednesday, June 10, 09.30 – 18.10

09.30 - 10.30 Plenary Session
10.30 - 11.00 Coffee-Break
11.00 - 13.00 Session: Nonlinear dynamics in medicine and social
systems
13.00 - 14.00 Lunch
14.00 - 15.15 Session: Nonlinear dynamics in medicine and social
systems
15.15 - 15.40 Coffee-Break
15.40 - 18.10 Session: Particles

Thursday, June 11, 09.00 – 19.00

09.00 – 19.00 Field Session: round-tables
15.00 - 16.00 Lunch
Cultural part: Excursion

Friday, June 12, 9.30 – 16.10

09.30 - 11.10 Session: Astrophysics and gravitation
11.10 - 11.40 Coffee-Break
11.40 - 13.00 Session: Media
13.00 - 14.00 Lunch
14.00 - 16.00 Session: Modelling and Safety Related Analyses of NPP
16.00 - 16.10 Final Discussion: Problems and Perspectives. Closing

Monday, June 8, 09.00-19.40

9.00 – 10.00 Registration

10.05 - Opening 5 min

Trifonov A.G., Lukashevich A.G., Shaparau V.A.

10.05 - 11.30 Plenary Session

Chairman: **Trifonov A.G.**

1. **Yuri Kulchitsky** (Joint Institute for Nuclear Research, Dubna, Russia) “Recent Results of the ATLAS at the LHC” (35 min)
2. **Dmitrii Krivenkov**, Averyanov Alexander (Joint Institute for Nuclear Research, Dubna, Russia) “HYP2025: a Review of Recent Advances in Hypernuclear and Strange Particle Physics” (25 min)
3. **L.P. Kaptari** (Joint Institute for Nuclear Research, Dubna, Russia), O.P. Solovtsova, V.I. Lashkevich (Gomel State Technical University, Gomel, Belarus) “The 12th-order QED Radiative Corrections to Lepton Anomalies due to the Vacuum Polarization Insertions within the Mellin-Barnes Representation” (25 min)

11.30 - 12.00 Coffee-Break

12.00 - 13.30 Plenary Session

Chairman: **Solovtsova O.P.**

1. **V.M. Red'kov** (Stepanov Institute of Physics of the National Academy of Sciences of Belarus, Minsk, Belarus), A.V. Ivashkevich, N.M. Kuzmich, A.V. Bury, P.O. Sacenok, E.M. Ovsyuk “Charged and Neutral Particles with Spin 1/2 and Three Additional Characteristics in Magnetic and Electric Fields” (30 min)
2. **M.B. Галынский** (Объединенный институт энергетических и ядерных исследований – Сосны НАН Беларуси, Минск, Беларусь) “Свойства амплитуд и дифференциальных сечений процессов $ep \rightarrow ep$, $e\bar{e} \rightarrow p\bar{p}$, $p\bar{p} \rightarrow e\bar{e}$ ” (30 min)
3. **Alexander Shalyt-Margolin** (Research Institute for Nuclear Problems, BSU, Minsk, Belarus) “Quantum-Gravity Corrections to Primordial Black Holes in Various Cosmological Epochs. Some Inferences” (30 min)

13.30 - 14.30 Lunch

14.30 - 16.30 Session: QED and QCD

Chairman: **Galynskii M.V.**

1. **O.P. Solovtsova** (Gomel State Technical University, Gomel, Belarus), D.A. Volkova, N.A Gramotkov, O.V. Teryaev (Joint Institute for Nuclear Research, Dubna, Russia) “Analytical Matching of Short-Long Distance in QCD” (20 min)
2. **V.I. Lashkevich** (Gomel State Technical University, Gomel, Belarus), L.P. Kaptari (Joint Institute for Nuclear Research, Dubna, Russia), O.P. Solovtsova “Analytical Contribution to the Lepton Anomaly from Some Eighth-Order Mixed-type QED Diagrams within the Mellin-Barnes Representation” (20 min)
3. **Yu. A. Kurochkin**, S. N. Harkusha (Stepanov Institute of Physics of the National Academy of Sciences of Belarus, Minsk, Belarus), Y. A. Kulchitsky, N. A. Russakovich (Joint Institute for Nuclear Research, Dubna, Russia) “A Quark in a Constant Non-Abelian Field and the Decolorization Problem” (20 min)
4. **Valery Shaparau** (Joint Institute for Power and Nuclear Research – Sosny of the National Academy of Sciences of Belarus, Minsk, Belarus) “Colour Gluon Squeezing in QCD Jet Ring at the Non-perturbative Evolution Stage” (20 min)
5. **R.G. Shulyakovsky** (Institute of Applied Physics of the National Academy of Sciences of Belarus, Minsk, Belarus), E.S. Kokoulina, M.I. Levchuk, M.N. Nevmerzhitsky “Meron-Meron Solutions in Quantum Chromodynamics” (20 min)
6. **Yu.D. Chernichenko** (Gomel State Technical University, Gomel, Belarus) “Wave Function and S Factor of Nucleon into Quark-Diquark Model with Chromodynamical Interaction” (20 min)

16.30 - 17.00 Coffee-Break

17.00 - 19.00 Session: QED and QCD

Chairman: *Shaparau V.A.*

1. E.S. Timoshin, **S.I. Timoshin** (Gomel State Technical University, Gomel, Belarus) “The Contributions of the Quarks to the Nucleon Spin in the DIS the Neutrino on the Polarized Protons” (20 min)
2. **S.I. Timoshin**, E.S. Timoshin (Gomel State Technical University, Gomel, Belarus) “The Quark Polarization from the Neutrino Experiments off the Polarized Deuterons” (20 min)
3. **A. Aparin**, S. Sharma (Joint Institute for Nuclear Research, Dubna, Russia) “Gluon Helicity from J/ψ Production at Moderate-to-high x ” (20 min)
4. **N.A. Gramotkov**, O.V. Teryaev, D.A. Volkova (Joint Institute for Nuclear Research, Dubna, Russia) “Matching of TMD and pQCD Descriptions of Drell-Yan Angular Distributions” (20 min)
5. **O.P. Solovtsova**, D.A. Volkova, O.V. Teryaev, N.A. Gramotkov (Joint Institute for Nuclear Research, Dubna, Russia) “Analytic Perturbation Theory with a Chiral-like Matching Expansion for the Bjorken Sum Rule in the Infrared Region” (20 min)
6. **M.N. Nevmerzhitsky**, R.G. Shulyakovsky (Institute of Applied Physics of the National Academy of Sciences of Belarus, Minsk, Belarus), E.S. Kokoulina, M.I. Levchuk “Helicity-dependent Cross Sections of the Reaction of Incoherent Pion Photoproduction on the Deuteron in Threshold Energy Region” (20 min)

19.00 - 19.40 Session: Classical and Quantum Mechanical Problems

Chairman: *Krylov G.G.*

1. **H.V. Grushevskaya**, A.I. Timoshchenko (Belarusian State University, Minsk, Belarus) “Emergence of Topologically Protected Vortical Ion-neutralizing Currents under Action of Gamma Radiation” (20 min)
2. **N.G. Krylova** (Belarusian State Agrarian Technical University, Minsk, Belarus), H.V. Grushevskaya (Belarusian State University, Minsk, Belarus) “Bubble Nucleation Rate in a Finsler-Lagrange Geometrodynamical Model of Phase Transition” (20 min)

Tuesday, June 9, 09.00-18.40

09.00 – 10.40 Session: Information theory and processing

Chairman: *Krylov G.G.*

1. **Natalia Savitskaya**, Tatiana Fedorova (Petersburg Nuclear Physics Institute named by B.P. Konstantinov of NRC "Kurchatov Institute", Gatchina, Russia) "Feedback Effects on the Dynamics in a System of Binary-state Threshold Elements with Activity-driven Interactions" (25 min)
2. **V.N. Chizhevsky**, M.V. Lakhmitski, S.Ya. Kilin (Stepanov Institute of Physics of the National Academy of Sciences of Belarus, Minsk, Belarus) "Stochastic Computing Simulation in the Artificial Spiking Neural Network with Probabilistic Response of Neurons" (25 min)
3. **A. Naumenko**, L. Blizniuk, Yu. Kurochkin (Stepanov Institute of Physics of the National Academy of Sciences of Belarus, Minsk, Belarus) "Underwater NaI:Tl and SrI2+ Gamma-ray Spectrometers: Experiments, Monte Carlo Simulations, Full Spectrum Analysis" (25 min)
4. **S. Sytova**, V. Haurylavets, A. Dunets, A. Kovalenko, E. Kovalenko, Z. Trafimchik, S. Charapitsa (Research Institute for Nuclear Problems, BSU, Minsk, Belarus) "Integrating Artificial Intelligence Technologies into the Portal of Nuclear Knowledge BelNET" (25 min)

10.40 - 11.10 Coffee-Break

11.10 - 13.00 Plenary Session

Chairman: *Trifonov A.G.*

1. **A.L. Толстик**, Е.А. Мельникова (Белорусский государственный университет, Минск, Беларусь) "Оптические вихри. Методы получения, диагностики и практическое использование" (30 min)
2. **S.N. Kurilkina** (Institute of Physics of NASB, Minsk, Belarus) "Formation and Propagation of Quasi-diffraction-free Tubular Light Beams" (30 min)

3. **Ф.М. Трухачёв**, Н.В. Герасименко, М.М. Васильев, О.Ф. Петров (Белорусско-Российский университет, Могилев, Беларусь) "Волновой перенос вещества, теория и эксперимент" (30 min)
4. V.V. Kabanov, **A.O. Nehryienka** (Stepanov Institute of Physics of the National Academy of Sciences of Belarus, Minsk, Belarus) "Canonical-Conjugate Fourier Representations of Laser Beam Speckle Patterns" (20 min)

13.00 - 14.00 Lunch

14.00 - 16.20 Session: Particles

Chairman: *Shaparau V.A.*

1. **O.M. Boyarkin** (International Sakharov Environmental Institute, BSU, Minsk, Belarus), G.G. Boyarkina, V.V. Makhnach "Searches for Processes of the W^\pm -boson Production at Muon Colliders" (20 min)
2. **Oleg Rogachevsky** (Joint Institute for Nuclear Research, Dubna, Russia) "Di-hadron Correlations in Relativistic Nuclear Physics" (20 min)
3. **V.S. Melezhhik** (Joint Institute for Nuclear Research, Dubna, Russia) "Wave-like Amplification of Near-threshold Two-particle Reactions: from Muon-catalyzed Fusion to $\Lambda\Lambda$ Production at e^-e^+ Annihilation" (20 min)
4. **D.A. Artemenkov**, P.I. Zarubin (Joint Institute for Nuclear Research, Dubna, Russia) "Investigation of Light Nuclei Cluster Structure with Nuclear Track Emulsions" (20 min)
5. **Georgii Kalagov**, Nikita Lebedev (Joint Institute for Nuclear Research, Dubna, Russia) "Critical Behavior of Isotropic Systems with Strong Dipole-dipole Interaction from the Functional Renormalization Group" (20 min)

Wednesday, June 10, 09.30-18.10

09.30 - 10.30 Plenary Session

Chairman: *Trifonov A.G.*

1. **E.M. Ovsiyuk** (Mozyr State Pedagogical University, Mozyr, Belarus), A.V. Ivashkevich, P.O. Sacenok, A.S. Martynenko “Orthogonal Coordinates in Lobachevsky – Riemann Spaces of Constant Curvature, and the Ricci Rotation Coefficients” (30 min)
2. **G.J. Söderbacka** (Åbo Akademi, Åbo, Finland) “Coexistence of Attractors of Low Period for Some Families of One-Dimensional Maps” (30 min)

10.30 - 11.00 Coffee-Break

11.00 - 13.00 Session: Nonlinear dynamics in medicine and social systems

Chairman: *Shaparava E.A.*

1. **A.P. Киселев** (Национальный медицинский исследовательский центр терапии и профилактической медицины Минздрава России, Москва, Россия), С.Г. Пашкевич “Нелинейная динамика в вегетативной регуляции сердечно-сосудистой системы” (30 min)
2. **A.E. Руннова** (Саратовский государственный медицинский университет им. В.И. Разумовского Минздрава России, Саратов, Россия), М.О. Журавлев, Н.С. Акимова “Исследование фазовой синхронизации и сетевых структур в комплексах физиологической активности при кардиоваскулярных патологиях” (30 min)
3. **A.B. Кувшинов** (Медицинский центр "Мелисса-Мед", Минск, Беларусь) “Применение фотодинамической терапии в комплексном лечении стоматологических заболеваний” (30 min)
4. **Margarita Voitkova** (Stepanov Institute of Physics of the National Academy of Sciences of Belarus, Minsk, Belarus) “Predictive Modeling and Classification of Heart Rate Variability” (30 min)

13.00 - 14.00 Lunch

14.00 - 15.15 Session: Nonlinear dynamics in medicine and social systems

Chairman: *Kuvshinov A.V.*

5. **E. Mikhalycheva**, N. Kuzmina (Joint Institute for Power and Nuclear Research – Sosny, Minsk, Belarus) “Human Reliability Analysis within the Frame of the Probabilistic Safety Analysis of the Nuclear Power Plant with VVER” (25 min)
6. **Anatoly Zherelo** (Belarusian State University, Joint Institute for Power and Nuclear Research – Sosny of the National Academy of Sciences of Belarus, Minsk, Belarus) “On the "bubble" Model of Disease Spread” (25 min)
7. **N.V. Efimova** (Belarus State University, Minsk, Belarus) “Media Space of the Modern City” (25 min)

15.15 - 15.40 Coffee-Break

15.40 - 18.10 Session: Particles

Chairman: *Rogachevsky O.V.*

1. **С.Л. Авакян**, Е.З. Авакян, Е.С. Кокоулина (Gomel State Technical University, Gomel, Belarus) “Электромагнитные взаимодействия псевдоскалярных мезонов” (20 min)
2. С.Л. Авакян, **Е.З. Авакян**, Е.С. Кокоулина (Gomel State Technical University, Gomel, Belarus) “ η, η' мезоны при низких энергиях” (20 min)
3. **V.Yu. Haurysh**, V.V. Andreev (Gomel State Technical University, Gomel, Belarus) “ $D^{*\pm}, D^{*0}$ – Meson Form-factors in Relativistic Quantum Mechanics” (20 min)
4. **Y.A. Rusak**, L.F. Babichev (Joint Institute for Power and Nuclear Research – Sosny of the NAS of Belarus, Minsk, Belarus) “Charged Hadron Multiplicity Distributions and its Fluctuations as Signatures of the Quark-Gluon Plasma Presence in the Monte-Carlo Modeling of Heavy Ion Collisions” (20 min)

Friday, June 12, 9.30-16.10

9.30 - 11.10 Session: Astrophysics and gravitation

Chairman: *Shalyt-Margolin A.E.*

1. **Ю.П. Выблый**, Н.Д. Шайковская (Институт физики НАН Беларуси, Минск, Беларусь) “Скалярно-тензорная теория гравитации со скалярным полем, взаимодействующим с материей” (20 min)
2. **S.O. Komarov** (Belarusian State University, Minsk, Belarus), A.K. Gorbatsievich, G.V. Vereshchagin, A.S. Garkun (Institute of Applied Physics of the National Academy of Sciences of Belarus, Minsk, Belarus) “Electric and Magnetic Fields of a Charged Axially-symmetric Conductor with Charge in the Equatorial Plane of Kerr Black Hole” (20 min)
3. N.G. Krylova (Belarusian State Agrarian Technical University, Minsk, Belarus), **V.M. Red'kov** (Stepanov Institute of Physics of the National Academy of Sciences of Belarus, Minsk, Belarus) “Dirac Particle in Gravitational Field of Rotating Black Hole with NUT Parameter” (20 min)
4. **A.V. Bury**, V.M. Red'kov (Stepanov Institute of Physics of the National Academy of Sciences of Belarus, Minsk, Belarus) “On Geometrical Interaction Terms with Gravitational Fields for a Spin 1/2 Particle with 3 Additional Characteristics, Petrov's Classification of Riemannian Space-times” (20 min)
5. **A.S. Garkun** (Institute of Applied Physics of the National Academy of Sciences of Belarus, Minsk, Belarus), N.N. Sidorik (Belarusian State University, Minsk, Belarus) “Integrable Domain of Parameters of the Gravitational Lagrangian in Spacetime with Two Killing Vectors in the Poincare Gauge Theory of Gravity” (20 min)

11.10 - 11.40 Coffee-Break

11.40 - 13.00 Session: Media

Chairman: *Krylov G.G.*

1. Halina Grushevskaya and **George Krylov** (Belarusian State University, Minsk, Belarus) “Majorana Fermion Graphene Model: Chirality Break and Asymmetry of Optical Response” (20 min)
2. H.V. Grushevskaya, A.S. Babenko, V.P. Egorova, N.G. Krylova, **E.V. Vaskovtsev**, V.D. Demyashkevich (Belarusian State University, Minsk, Belarus) “First-order Phase Transitions and Strengthened Hybridization Response of Electrically and Optically Active DNA Conjugates with Carbon Nanotube Self-assemblies” (20 min)
3. **S.V. Anishchenko**, V.G. Baryshevsky, A.A. Gurinovich (Research Institute for Nuclear Problems, BSU, Minsk, Belarus) “Deuteron Spin Dichroism in Unpolarized Carbon Target at Different Energies” (20 min)
4. **A.O. Shaplov**, A.S. Garkun, M.N. Nevmerzhitsky, R.G. Shulyakovsky (Institute of Applied Physics of the National Academy of Sciences of Belarus, Minsk, Belarus) “Magnetization Distribution in a Ferromagnetic Cylinder in an External Uniform Magnetic Field” (20 min)

13.00 - 14.00 Lunch

