



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

NONLINEAR PHENOMENA IN COMPLEX SYSTEMS

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

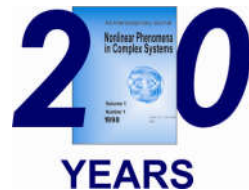
Minsk, Belarus

MAY 21 – 25, 2018

XXV Annual Seminar

Program

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An Interdisciplinary Journal
**NONLINEAR PHENOMENA
IN COMPLEX SYSTEMS**

<http://www.j-npcs.org/>



Monday, May 21, 10.00-17.00

9.00 - 10.00 Registration
10.00 - 10.50 Opening and Congratulation
10.50 - 12.50 Plenary Session
12.50 - 13.00 Coffee-Break
Совещание представителей учредителей журнала
“NONLINEAR PHENOMENA IN COMPLEX SYSTEMS”
13.00 - 14.00 Lunch
14.00 - 15.00 Plenary Session
15.00 - 15.30 Coffee-Break
15.30 - 17.00 Plenary Session

Tuesday, May 22, 09.00-17.00

09.00 - 10.30 Plenary Session
10.30 - 11.00 Coffee-Break
11.00 - 12.30 Plenary Session
12.30 - 14.00 Lunch
14.00 - 16.00 Session: Quantum and Classical Electrodynamics
16.00 - 16.20 Coffee-Break
16.20 - 17.00 Session: Posters
Cultural part: Theatre

Wednesday, May 23, 09.00 – 17.30

09.00 - 10.30 Plenary Session
10.30 - 11.00 Coffee-Break
11.00 - 12.30 Plenary Session
12.30 - 14.00 Lunch
14.00 - 15.20 Session: Particles
15.20 - 15.50 Coffee-Break
15.50 - 17.30 Session: Particles

Thursday, May 24, 09.00 – 18.00

09.30 – 18.00 Field Session: round-tables
Coffee-Break

Cultural part: Excursion

Friday, May 25, 09.00 – 19.00

09.00 - 11.00 Plenary Session
11.00 - 11.30 Coffee-Break
11.30 - 13.00 Session: Nuclear Physics and Particles
13.00 - 14.00 Lunch
14.00 - 15.20 Session: Media Modeling
15.20 - 15.40 Coffee-Break
15.40 - 18.20 Session: Nuclear Physics and NPP Modeling
18.20 - 19.00 Final Discussion: Problems, Perspectives, Philosophy
19.00 – Closing

Monday, May 21, 10.00-17.00

9.00 – 10.00 Registration

10.00 - Opening and Congratulation

Chairman: Trifonov A.G.

V.I. Kuvshinov (Joint Institute for Power and Nuclear Research – Sosny, NASB, Minsk, Belarus) “25-й международный семинар NPCС–18. 20-лет журналу “Nonlinear Phenomena in Complex Systems”

10.50 - 12.50 Plenary Session

Chairman: Kuvshinov V.I.

1. P.A. Vityaz, V.T. Senyut, M.L. Kheifetz, A.G. Kolmakov, and E.O. Nasakina “Designing and Synthesis of Alumo-Matrix Composite Material Modified by Nanostructured Cubic Boron Nitride” (30 min)
2. V.G. Baryshevsky (Research Institute for Nuclear Problems, BSU, Minsk, Belarus) "High energy nuclear optics of polarized particles" (30 min)
3. O.V. Rogachevsky (Joint Institute for Nuclear Research, Dubna, Russia) “Status of NICA project in JINR (Dubna)” (30 min)
4. H.V. Grushevskaya (Belarusian State University, Minsk, Belarus) “Graphene and graphene-like materials: anomalous electron and magnetic properties” (30 min)

12.50 - 13.00 Coffee-Break

**Совещание представителей учредителей журнала
“NONLINEAR PHENOMENA IN COMPLEX SYSTEMS”**

13.00 - 14.00 Lunch

14.00 - 15.00 Plenary Session

Chairman: Krylov G.G.

1. A.L. Sanin (Peter the Great St. Petersburg Polytechnic University, St. Petersburg, Russia), A.A. Smirnovsky “Stochastic resonances of anharmonic oscillators in scrodinger-langevin formalism” (30 min)
2. O.P. Solovtsova, A.V. Sidorov, V.I. Lashkevich (Gomel State Technical University, Gomel, Belarus) “The inverse Mellin transform method for fragmentation function and the effective contour of stationary phase” (30 min)

15.00 - 15.30 Coffee-Break

15.30 - 17.00 Plenary Session

Chairman: Trifonov A.G.

1. O.V. Rogachevsky (Joint Institute for Nuclear Research, Dubna, Russia) “Implementaton of Higuchi method of fractal dimension measurement for the multpartcele event” (30 min)
2. L.P. Babichev (Joint Institute for Power and Nuclear Research – Sosny, NASB, Minsk, Belarus) “Computer simulation and safety analysis of the Belarusian NPP” (30 min)
3. V.V. Gilevsky, I.S. Satsunkevich, M.M. Sobolevsky (Joint Institute for Power and Nuclear Research – Sosny, NASB, Minsk, Belarus), V.M. Redkov, O.M. Boyarkin “Antineutrino detector for BelNPP” (30 min)

Tuesday, May 22, 09.00-17.00

09.00 - 10.30 Plenary Session

Chairman: Kuvshinov V.I.

1. A.P. Nizovtsev, S.Ya. Kilin, A.L. Pushkarchuk, V.A. Pushkarchuk, S.A. Kuten, F.Jelezko (Center of Quantum Optics and Quantum Information, Institute of Physics of NAS, Minsk, Belarus) “Hyperne-coupled NV-¹³C complexes in diamond: Systematic computer simulation versus experiment” (30 min)
2. Ignatios Antoniadis (Sorbonne Universite and University of Bern, Director of Research, French) “Inflation from supersymmetry breaking” (30 min)
3. Gennadii Volkov (St-Peterburg Nuclear Physics Institute, National Research Centre "Kurchatov Institute", Gatchina, Russia) “Three-Neutrino on the Multidimensional Extension of the Space-Temporal Continuum of the Visible Universe” (30 min)

10.30 - 11.00 Coffee-Break

11.00 - 12.30 Plenary Session

Chairman: Volkov G.G.

1. Svetlana Kurilkina, Nguyen Pham Quynh Anh (Institute of Physics, NASB, Minsk, Belarus) “Features of plasmon-polaritons in polariton metamaterials” (30 min)
2. A. Gorbatsievich, A. Shaplov, K. Tischenkova (Belarusian State University, Minsk, Belarus) “Spherically symmetric charged wormhole in the framework of the general theory of relativity and 5-dimensional projective unified field theory” (30 min)
3. Alexander Shalyt-Margolin (Research Institute for Nuclear Problems, BSU, Minsk, Belarus) “Minimal Quantities and Measurability.Gravity in Measurable Format and Natural Transition to High Energies” (30 min)

12.30 - 14.00 Lunch

14.00 - 16.00 Session: Quantum and Classical Electrodynamics

Chairman: Galynskii M.V.

1. Yu. A. Kurochkin, V.S. Otchik (Institute of Physics, NASB, Minsk, Belarus) “Nonrelativistic particle with spin 1 in the Lobachevsky space” (20 min)
2. Kuvshinov V.I. Kazitski E.E., V.A. Piatrou (Joint Institute for Power and Nuclear Research – Sosny, NASB, Minsk, Belarus) “Particle tunneling through rectangular potential barriers under the influence of external action” (20 min)
3. A.V. Baran, V.V. Kudryashov (Institute of Physics, NASB, Minsk, Belarus) “Parabolic potential well of finite depth” (20 min)
4. A.V. Kulikov, A.A. Maslikov, S.V. Smurov, G.G. Volkov (St-Peterburg Nuclear Physics Institute, National Research Centre "Kurchatov Institute", Gatchina, Russia) “Geometry and Quantum Control of Cubit-Cutrit Systems” (20 min)
5. K.A. Dadochkina, S.V. Smurov, G.G. Volkov (St-Peterburg Nuclear Physics Institute, National Research Centre "Kurchatov Institute", Gatchina, Russia) “On the Geometry of the Invisible Light of the Universe” (20 min)
6. A. Leonau, I. Feranchuk, M. Eskandari (Belarusian State University) “Nonlinear control of spontaneous emission in a quantum system by a resonant electromagnetic field” (20 min)

16.00 - 16.20 Coffee-Break

16.20-17.00 Poster Session

Chairman: Babichev L.F.

1. O.P. Solovtsova, O.V. Teryaev, M.E. Kozhevnikova (Joint Institute for Nuclear Research, Dubna, Russia) “Extraction of condensates from tau decays via the Borel transform of the Adler function”
2. I.A. Serenkova, A.A. Pankov (Gomel State Technical University, Gomel, Belarus) “Searches of extra spatial dimensions at the LHC Run2 and prospects for HL-LHC option”

3. Marina Kozhevnikova (JINR, Dubna, Russia), Armen Oganesian, Olga Solovtsova, Oleg Teryaev “Precise study of non-perturbative contributions in e^+e^- -annihilation”
4. L. Babichev (Joint Institute for Power and Nuclear Research – Sosny, NASB, Minsk, Belarus), S. Bakhanovich, G. Gromyko, A. Zherelo (IM, NASB, Minsk, Belarus) “Simulation of Heat Removal from Fuel Rods with a non-uniform heat flux in a Turbulent Flow”
5. Kiryl Viarenich, Victor Minenko, Krystsina Makarevich, Arkady Khrutchinsky, Siamion Kutsen (Research Institute for Nuclear Problems, BSU, Minsk, Belarus) “Dose distribution in human body during Computed Tomography scans: the first results”
6. Krystsina Makarevich, Viktor Minenko, Semen Kutsen (Research Institute for Nuclear Problems, BSU, Minsk, Belarus) “Effects of beam properties on doses in organs and tissues for thorax radiography”
7. A.L. Pushkarchuk, S.A. Kuten, V.A. Pushkarchuk, A.P. Nizovtsev and S.Ya. Kilin (Center of Quantum Optics and Quantum Information, Institute of Physics of NAS, Minsk, Belarus) “Germanium-vacancy color center in volume and near-surface diamond for spintronic applications: Simulation of electronic and spin properties”

Wednesday, May 23, 09.00-17.30

09.00 - 10.30 Plenary Session

Chairman: Kuvshinov V.I.

1. A.N. Bugay, S.V. Aksenova, A.S. Batova, M. Batmunkh, L. Bayarchimeg, E.B. Dushanov, E.A. Kolesnikova, M.S. Panina, A.Yu. Parkhomenko, M.A. Vasilyeva (Joint Institute for Nuclear Research, Dubna, Russia) “Computer Modelling of Radiation-Induced Disorders in Central Nervous System” (30 min)
2. V.M. Red'kov (Institute of Physics, NASB, Minsk, Belarus), V.V. Kisel, V.A. Pletjukhov, E.M. Ovsiyuk, Y.A. Voynova, O.V. Veko “Fermion with Three Mass Parameters: General Theory, Interaction with External Fields” (30 min)
3. E.S. Timoshin, S.I. Timoshin (Gomel State Technical University, Gomel, Belarus) “The Quark Contributions to the Nucleon Spin from Polarized Lepton-Nucleon DIS with Neutral Current” (30 min)

10.30 - 11.00 Coffee-Break

11.00 - 12.30 Plenary Session

Chairman: Volkov G.G.

1. Vadim Savva, Sary Banjak (Belarus State Technological University, Minsk, Belarus) “Orthogonal Polynomials of a Discrete Variable to Construct the Dynamical Equation Solutions for Quantum Systems Excited by Laser Radiation” (30 min)
2. Galynskii M.V. (Joint Institute for Power and Nuclear Research – Sosny, NASB, Minsk, Belarus) “On Physical Meaning of Sachs Form Factors and on their Measurement in Processes with and without Proton Spin Flip” (30 min)
3. Stanislav Komarov, Alexander Gorbatsievich, Alexander Tarasenko (Belarusian State University Minsk, Belarus) “Binary star motion in the field of Kerr black hole” (30 min)

12.30 - 14.00 Lunch

14.00 - 15.20 Session: Particles

Chairman: Galynski M.V.

1. V.I. Lashkevich, A.V. Sidorov, O.P. Solovtsova, I.A. Zhevnyak (Gomel State Technical University, Gomel, Belarus) “On high-precision numerical estimates of Mellin-Barnes integrals” (20 min)
2. O.M. Boyarkin, V.V. Makhnach, D.S. Vasileuskaya (BSU, Minsk, Belarus) “Neutrino mixings as a source of charged lepton flavor violations” (20 min)
3. I.S. Satsunkevich and V.V. Gilewsky (Joint Institute for Power and Nuclear Research – Sosny, NASB, Minsk, Belarus) “Neutrino as the object and the means of investigations” (20 min)
4. R.A. Shindin, D.K. Guriev, A.N. Livanov, I.P. Yudin (Joint Institute for Nuclear Research, Dubna, Russia) “Interesting effect of the $nd > p(nn)$ reaction” (20 min)

15.20 - 15.50 Coffee-Break

15.50 - 17.30 Session: Particles

Chairman: Gilewsky V.V.

1. E.G. Bagashov and V.I. Kuvshinov (Joint Institute for Power and Nuclear Research – Sosny, NASB, Minsk, Belarus) “No-cloning and no-hiding theorems in QCD” (20 min)
2. L.F. Babichev, Y.A. Rusak (Joint Institute for Power and Nuclear Research – Sosny, NASB, Minsk, Belarus) “Allowance for fluctuations near 1st order phase transition point in Monte Carlo simulation of heavy ion collisions” (20 min)
3. Shershan I.A., Shishkina T.V (Belarusian State University Minsk, Belarus) “The lowest-order radiative effects in the processes of the gauge boson production in high energy electron-photon collisions” (20 min)
4. Khasianevich U. U., Shishkina T. V. (Belarusian State University) “Electroweak radiative corrections to the fermion-antifermion production in electron-positron collisions” (20 min)
5. Andrei Manko (Institute of Physics, NASB, Minsk, Belarus) and R.G. Shulyakovsky “The two-photon production W-boson pair at colliders at the leading and the next-to-leading order” (20 min)

Friday, May 25, 09.00-19.00

09.00 - 11.00 Plenary Session

Chairman: Kuvshinov V.I.

1. Yurii Kurochkin (Institute of Physics, NASB, Minsk, Belarus) “The model of scalar hadron on the base of classical field theory” (30 min)
2. Halina Grushevskaya, George Krylov (Belarusian State University, Minsk, Belarus) “Topological phases for quasi-relativistic model of graphene” (30 min)
3. Voitikova M.V. (Institute of Physics, NASB, Minsk, Belarus) “Hemodynamic phenotyping on arterial blood pressure measurements and effectiveness of apnea therapy” (30 min)
4. Tikhomirov V.V. (Research Institute for Nuclear Problems, BSU, Minsk, Belarus) “First observation of accelerated electromagnetic shower development in lead tungstate crystal” (30 min)

11.00 - 11.30 Coffee-Break

11.30 - 13.00 Session: Nuclear Physics and Particles

Chairman: Galynski M.V.

1. Ed.A. Rudak, M.O. Kravchenko, T.N. Korbut, A.V. Kuzmin, A.M. Petrovski (Joint Institute for Power and Nuclear Research – Sosny, NASB, Minsk, Belarus) “An analytical description of the emitters decay for a thermal reactor within the particles' birth and death model framewor” (30 min)
2. L.F. Babichev, Ya.S. Harohau (Joint Institute for Power and Nuclear Research – Sosny, NASB, Minsk, Belarus) “Generation of few-group cross section library for reflector of VVER reactor with MCU-PD Monte Carlo code” (30 min)
3. I.V. Rudziankou, L.F. Babicheu (Joint Institute for Power and Nuclear Research – Sosny, NASB, Minsk, Belarus) “Neutron spectra assesment using weight windows consdiering media properties” (30 min)

13.00 - 14.00 Lunch

14.00 - 15.20 Session: Media Modeling

Chairman: Gilewsky V.V.

1. Le Thi Dieu Hien, Semen Kuten, Arkady Khrutchinsky (Belarusian State University, Minsk, Belarus) “Modeling of charge transport in the active volume of the cylindrical fission chamber” (20 min)
2. S.V. Anishchenko, V.G. Baryshevsky, I.V. Moroz, A.A. Rovba (Belarusian State University, Minsk, Belarus) “Theoretical and experimental investigation of beam radiation instability in split-cavity oscillator” (20 min)
3. H.V. Grushevskaya, N.G. Krylova, I.V. Lipnevich, A.S.Babenka, V.P. Egorova, R.F. Chakukov, L.V. Tabulina, D. Radziuk (Belarusian State University, Minsk, Belarus) “Electrochemical impedimetric nanosensor based on surface effects in conducting LB-films with graphene-like materials” (20 min)
4. A.L. Pushkarchuk, T.V. Bezyazychnaya, V.I. Potkin, A.P. Nizovtsev, S.Ya.Kilin, A.G. Soldatov (Center of Quantum Optics and Quantum Information, Institute of Physics of NAS, Minsk, Belarus), A.A.Khrutchinsky, S.A.Kuten, L.F. Babichev “DFT simulation of interaction between single-walled carbon nanotube and cisplatin as anticancer agent” (20 min)

15.20 - 15.40 Coffee-Break

15.40 - 18.20 Session: Nuclear Physics and NPP Modeling

Chairman: Trifonov A.G.

1. V.A. Shaparau, E.G. Vashetko (Joint Institute for Power and Nuclear Research – Sosny, NASB, Minsk, Belarus) “Results of exemplary LOCA analyses with ATHLET for a generic VVER-1000 plant” (30 min)
2. V.A. Shaparau (Joint Institute for Power and Nuclear Research – Sosny, NASB, Minsk, Belarus) “The possibility of using the code ATHLET in determenistic safety analysis of VVER-1200 plant” (10 min)
3. Krystsina Usheva, Semen Kuten, Arkady Khruschinsky (Research Institute for Nuclear Problems, BSU, Minsk, Belarus), Leonid Babichev “One control rod ejection” accident analysis for the AES-2006 project” (20 min)

4. D.L. Tretinnikov, A.V. Doinikova (Joint Institute for Power and Nuclear Research – Sosny, NASB, Minsk, Belarus) “Применение программного комплекса COCOSYS для моделирования теплогидравлических процессов внутри защитной оболочки РУ типа ВВЭР, протекающих при проектных авариях” (20 min)
5. V.V. Gilewsky, A.G. Lukashevich (Joint Institute for Power and Nuclear Research – Sosny, NASB, Minsk, Belarus) “Validation of the CPA code on the KAEVER experiment” (20 min)
6. A.G. Lukashevich, V.V. Gilewsky, D. Churilovich (Joint Institute for Power and Nuclear Research – Sosny, NASB, Minsk, Belarus) “Validation of the ICARE code on the QUENCH-06 experiment” (20 min)
7. A.M. Petrovski, T.N. Korbut, E.A. Rudak, M.O. Kravchenko (Joint Institute for Power and Nuclear Research – Sosny, NASB, Minsk, Belarus) “Residual heat comparison for stationary campaigns of WWER-1000 and WWER-1200 reactors after preliminary storage in the spent fuel pool” (20 min)
8. E. Mikhalycheva, P. Safonau, L. Yuriy (Joint Institute for Power and Nuclear Research – Sosny, NASB, Minsk, Belarus) “Probabilistic safety analysis of the reliability of the spent nuclear fuel storage pool cooling system (FAK) of NPP” (20 min)

18.20 - 19.00 Final Discussion: Problems, Perspectives, Philosophy

Chairman: Kuvshinov V.I.

19.00 Closing