The IX-th International Conference (SCT-19)
SOLITONS, COLLAPSES AND TURBULENCE:
Achievements, Developments and Perspectives
&
Scientific School "Nonlinear Days"

Yaroslavl, RUSSIA August 5-9, 2019

Programme

Sunday 04.08.2019

Arrival day

Monday 05.08.2019

09:00 – 09:50: ***Registration***

09:50 – 10:15: Opening (Tensor, YarSU, Kuznetsov, Mikhailov, Newell)
10:15 – 11:00: Newell Alan, Pattern universes (combined with lecture for young scientists)
11:00 – 11:30: Mikhailov A.V. Recursion, Hamiltonian and preHamiltonian operators for differential-difference equations
11:30 – 12:00: Rosanov N.N. Topological reactions and transformations of 3d-tangle laser solitons

12:00 – 13:00: ***Lunch***

SECTION I (Nonlinear phenomena)
13:00 – 13:30: Pelinovsky D. E. Rogue waves on the periodic and double-periodic background
13:30 – 14:00: Yankov V. From solitons and collapses to hierarchy of attractors
14:00 – 14:30: Mishin A.V. A dense layer formation in an electrostatic collisionless shock wave during the expansion of a hot dense plasma into a rarefied one
14:30 – 15:00: Kashchenko S.A. Normal form of equations with nonlinearities of dislocations and Fermi-Pasta-Ulam

SECTION II (Solitons)
13:00 – 13:30: Andrey Gelash, Strongly interacting soliton gas
13:30 – 14:00: Gerdjikov V.S. On dressing factors and soliton solutions of 2-dimensional Toda field theories
14:00 – 14:30: Dzhamay A. Discrete Painlevé equations in tiling problems
14:30 – 15:00: Kamalian Kopae M. A fibre-optic communication system using Inverse scattering transform based on solving a Riemann-Hilbert problem

15:00 – 15:30: ***Coffee break***

SECTION I (Nonlinear phenomena)
15:30 – 16:00: Roudenko Svetlana. Stability of solitons and stable collapse in NLS, Hartree and Zakharov-Kuznetsov equations
16:00 – 16:30: Mezentsev V. Vaseva I., Rubenchik A., Fedoruk M. and Turitsyn S., Beam shaping due to cladding induced self-focusing for applications in ultra-high power fiber laser
16:30 – 17:00: Badulin S. The generalized Phillips spectrum and wind-wave dissipation
17:00 – 17:30: Smirnov L. Solitary synchronization waves in distributed oscillators populations
17:30 – 18:00: Talipova T. Soliton and breather generation in the Gardner equation
18:00 – 18:30: Ussembayev N.S. Unidirectional gravity waves on the surface of a deep fluid

SECTION II (Solitons)
15:30 – 16:00: Smirnov S.V. Darboux integrability of discrete Toda lattices
16:00 – 16:30: Bagderina Yu.Yu. Point equivalence of second-order ODEs to the Painleve equations
16:30 – 17:00 Papamikos G., Set theoretical solutions of the Yang-Baxter equation and their associated integrable maps
17:00 – 17:30: Maslov E.M. Gravitational redshift of light signals in a breather-like dark matter halo
17:30 – 18:00: Garbuzov F.E. Forced Boussinesq-type models for nonlinear strain waves in solid waveguides
18:00 – 18:30: Stefanov A.A. MKdV equations related to Kac-Moody algebras of type $D_4^{(k)}$

18:30: ***Welcome reception***

Tuesday 06.08.2019

09:00 – 09:45: Falkovich G. No weak turbulence for old men (with introduction to information theory for young people)
09:45 – 10:30: Zakharov V.E. Analytic theory of wind-driven sea (combined with lecture for young scientists)
10:30 – 11:00: Wabnitz S. Hydrodynamic 2D turbulence and beam self-cleaning in multimode optical fibers
11:00 – 11:30: Lebedev V. V. Structure of coherent vortices caused by the inverse cascade of 2D turbulence and related problems
11:30 – 12:00: Takhtajan L.A. Integrable QM operators from mirror curves

12:00 – 13:00: ***Lunch***

SECTION I (Nonlinear phenomena)
13:00 – 13:30: Balakin A.A., Raman compression of laser pulses in wedge-shaped jet plasma
13:30 – 14:00: Sturman B. Frequency comb solutions for quadratic nonlinearity
14:00 – 14:30: Shukla V. Superfluid turbulence at finite temperatures: Estimation of effective viscosity
14:30 – 15:00: Skobelev S.A. Coherent propagation and compression of laser pulses in optical multi-core fiber

SECTION II (Solitons)
13:00 – 13:30: Grinevich P.G. Periodic NLS Cauchy problem for the rogue waves
13:30 – 14:00: Santini P.M. i)The theory of rogue waves at work in a nonlinear optics experiment, and ii) the rogue wave recurrence in NLS type equations
14:00 – 14:30: Novokshenov V. Yu. Generalized Hermite polynomials and monodromy-free potentials
14:30 –15:00: Alekseev G.A. Einstein equations: solution-generating methods as "coordinate" transformations in the solution space

15:00 – 15:30: ***Coffee break***

SECTION I (Nonlinear phenomena)
15:30 – 16:00: Benno Rumpf. Ensemble dynamics and the emergence of correlations in wave turbulence in one and two dimensions

16:00 – 16:30: Kachulin D.I. Interactions of coherent structures on the surface of deep water
16:30 – 17:00: Khusnutdinova K.R. The effects of the shear flows on surface and internal ring waves

SECTION II (Solitons)
15:30 – 16:00: Grahovski Georgi G. On the derivative nonlinear Schrodinger equation related to symmetric spaces
16:00 – 16:30: Talalaev D.V. Electrical varieties and discrete integrable systems
16:30 – 17:00: Karabut E.A. Reducing a free-boundary problem to the system of differential equations

17:00 – 17:30: ***Light dinner***

17:30 – 20:00: ***Excursion in the city (by bus).***

Wednesday 07.08.2019

09:00 – 09:45: Turitsyn S.K. Solitons in fibre communication channels and lasers (combined with lecture for young scientists)
09:45 – 10:30: Lushnikov P.M. Integrability of fully nonlinear Kelvin-Helmholtz instability dynamics for counterflow of superfluid and normal components of Helium (combined with lecture for young scientists)
10:30 – 11:00: Konopelchenko B.G., Universal parabolic regularization of the gradient catastrophes for the Burgers-Hopf equation and Jordan chain
11:00 – 11:30: Dias Frédéric. Rogue waves and analogies in optics and oceanography
11:30 – 12:00: Piterbarg L. Hamiltonian description of vortex systems

12:00 – 13:00: ***Lunch***

SECTION I (Nonlinear phenomena)
13:00 – 13:30: Annenkov S.Y. Evolution of weakly nonlinear random wave fields: kinetic equations vs the Zakharov equation
13:30 – 14:00: Efimov V.B. About vortex turbulence formation by a heat flux in superfluid helium in a long capillary
14:00 – 14:30: Geogjaev V.V. On stability of Kolmogorov spectra for surface gravity water waves
14:30 – 15:00: Zakharov D. Primitive potentials and bounded, non-vanishing solutions of the KdV equation

SECTION II (Solitons)
13:00 – 13:30: Stepanyants Yu. Lump structure and dynamics within the Kadomtsev-Petviashvili equation
13:30 – 14:00: Bogdanov L.V. Multidimensional dispersionless integrable systems - new developments
14:00 – 14:30: Lee Ray Kuang, Modulation instability and soliton dynamics with time-dependent nonlinearities.
14:30 – 15:00: Bychkov B.S. Topological recursion for Bousquet-Mélou-Schaeffer numbers

15:00 – 15:30: ***Coffee break***

SECTION I (Nonlinear phenomena)
15:30 – 16:00: Jen-Hsu Chang, -Nonlinear dispersion with quantum oscillator
16:00 – 16:30: Glyzin S.D. Diffusion chaos and its invariant characteristics
16:30 – 17:00: Preobrazhenskaya M.M. Complicated modes of two delay-couples oscillators with a relay nonlinearity

SECTION II (Solitons)
15:30 – 16:00: Kalyakin L.A. Asymptotics of the dynamic bifurcation saddle-node
16:00 – 16:30: Buryak A. Generalization of the Givental theory for the oriented WDVV equations
16:30 – 17:00: Dryuma V. On generalization of Taylor-Green vortex solution of the Navier-Stokes system of equations

17:00 – 18:00: ***Light dinner***

18:15 – 21:30: ***Volga excursion by boat.***

Thursday 08.08.2019

09:00 – 09:45: Sergeev A.G., Adiabatic limit in Gizburg-Landau and Seiberg-Witten equations (combined with lecture for young scientists)
09:45 – 10:30: Kamchatnov A.M. Dispersive shock wave theory for nonintegrable equations (combined with lecture for young scientists)
10:30 – 11:00: Jens Juul Rasmussen, Intermittent particle and energy transport in magnetically confined plasmas the role of coherent structures
11:00 – 11:30: Shrira V.I. Novel essentially 2-d evolution equations and collapses in boundary layers
11:30 – 12:00: Ferapontov E.V. Integrable Lagrangians and Picard modular forms

12:00 – 13:00: ***Lunch***

SECTION I (Nonlinear phenomena)
13:00 – 13:30: Agafontsev D.S. Generation of rogue waves from random wavefield of high nonlinearity
13:30 – 14:00: Korotkevich A.O. Inverse cascade of gravity waves in the presence of condensate: numerical results and analytical explanation
14:00 – 14:30: Chabchoub A. Solitons and breathers: an environmental fluid mechanics perspective
14:30 – 15:00: Ruban V. P. Long-lived quantum vortex knots and links in a trapped Bose-Einstein condensate

SECTION II (Solitons)
13:00 – 13:30: Sokolov V.V. Integrable evolution systems of geometric type
13:30 – 14:00: Pogrebkov A. Induced dynamics
14:00 – 14:30: Habibullin I.T. Classification of integrable two-dimensional lattices via Lie-Rinehart algebras
14:30 – 15:00: Orlov A.Yu. Integrable systems and combinatorics.

15:00 – 15:30: ***Coffee break***

SECTION I (Nonlinear phenomena)
15:30 – 16:00: Pushkarev A.N. Ocean Waves Generation Against the Wind: Fourier-Real Space

Energy Pipelines
16:00 – 16:30: Kashchenko A.A, Relaxation cycles in a model of two weakly coupled generators with delayed sign-changing feedback

SECTION II (Solitons)
15:30 – 16:00: Agafonov S.I. Contact structure on Fano variety of quadric and conservation laws of Hamiltonian PDEs
16:00 – 16:30: Garifullin R.N., A series of autonomous quad equations

16:30 – 17:00: ***Coffee break***

17:00 – 18:30: ***Poster session***
•Bogdanov S.A. Investigation of soliton communication lines
•Didenkulova E.G. Peculiarities of the oscillating wave packets (breathers) interaction within the framework of the modified Korteweg - de Vries equation
•Dremov S.V. Soliton interactions in the system of supercompact equations for counter propagating 1d waves
•Golitsyn G.S. Kolmogorov 1934 laws and their manifestations in various processes of nature
•Kashchenko I.S. Spatially inhomogeneous solutions of the system with a deviation in space
•Kontorovich V.M. Why is the microstructure of the main pulse and inter pulse of the pulsar in Crab so strikingly different?
•Kochurin E. A., Wave turbulence and collapses at the free surface of a liquid dielectric in an external tangential electric field
•Kulikov D.A. Landau-Hopf scenario of passage to turbulence can be realized
•Makridin Z.V. Periodic waves in a system of weakly coupled KdV-type equation
•Otajonov S. TBA
•Shirokov D. Classification of all constant solutions of SU(2) Yang-Mills equations with arbitrary current
•Turmanov B. TBA
•Zemskov E.P. Fronts, pulses and wave trains in reaction-diffusion equations with cross diffusion. Analytical solutions
•Zubareva O.V. Nonlinear dynamics of the free charged surface of an ideal fluid; formation of bubbles

18:30: ***Conference dinner***

Friday 09.08.2019

09:00 – 09:45: Pelinovsky E. Tsunami waves: nonlinear physics and geophysical application (combined with lecture for young scientists)
09:45 – 10:30: Buchstaber V.M. and Mikhailov A.V. Polynomial integrable Hamiltonian systems and symmetric powers of $\mathbb{C}^2$ (combined with lecture for young scientists)
10:30 – 11:00: Kocharovsky Vl.V. Parametric origin of an intracavity soliton in a superradiant laser with a low-Q cavity
11:00 – 11:30: Dyachenko A.I. New integrals of motion for water waves
11:30 – 12:00: Zubarev N.M. Formation of singularities on the free surface of an ideal fluid in the absence of external forces and capillarity

12:00 – 13:00: ***Lunch***

SECTION I (Nonlinear phenomena)
13:00 – 13:30: Oladyshkin I.V. Delayed nonlinear response of metallic structures after laser irradiation
13:30 – 14:00: Erokhin N.S. Nonlinear generation of flows of ultrarelativistic charged particles by electromagnetic waves in the space plasma
14:00 – 14:30: Neishtadt A.I. Destruction of adiabatic invariance in dynamics of charged particles near magnetic field null line

SECTION II (Solitons)
13:00 – 13:30: Kruglikov B.S. Dispersionless Lax pairs: from Zakharov and Penrose to nowadays
13:30 – 14:00: Sultanov O.A. Lyapunov functions and long-term asymptotics for solutions to a complex analogue of the second Painlevé equation
14:00 – 14:30: Pukhnachev V.V., Zhuravleva E.N. Blow up in a free boundary problem for Navier-Stokes equation

14:30 – 15:00: ***Coffee break***

15:00 – 15:30: Kuznetsov E.A. Expansion of the strongly interacting superfluid Fermi gas: symmetry and self-similar regimes (combined with lecture for young scientists)

15:30 – 16:00: ***Conference closing***

16:00 – 16:30: ***Refreshments***