



DAYS on DIFFRACTION - 2007

May 29 – June 1, 2007, St.Petersburg, Russia

The Program

grikurov@math.nw.ru

<http://math.nw.ru/dd07/Program.pdf>

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Tuesday, May 29, 2007

St.Petersburg Branch of Steklov's Math. Inst.
(27 Fontanka Quay, downtown)

8³⁰ – 9³⁰ REGISTRATION AND COFFEE

Main Hall

9³⁰ – 9⁴⁵ OPENING ADDRESS

Main Hall

OPENING SESSION

Chair : Buldyrev V.S.

Main Hall

9⁴⁵ – 10³⁰	Nazarov S.A.	On Continuous Spectra of the Elasticity Problems
10³⁰ – 11⁰⁰	Pavlov B.S.	Zero-Radius Potentials in Quantum Networks

11⁰⁰ – 11³⁰ COFFEE BREAK

Main Hall

MATHEMATICAL ASPECTS OF WAVE PROPAGATION (I)

Chair: Pavlov B.S.

Main Hall

SURFACE WAVES

Chair: Heyman E.

Hall 311

11³⁰ – 11⁴⁵	Smolyanov O.G.	Cauchy Problems in Bounded Domains, Feynman Path Integrals and Diffusions	Kiselev A.P., Ducasse E., Deschamps M., Darinskiy A.	New Exact Solutions for Acoustic Surface Waves Propagation in a Layered Structure
11⁴⁵ – 12⁰⁰			Geyer M.A., Yanovskaya T.B.	
12⁰⁰ – 12¹⁵	Lobanov I.S., Popov I.Yu.	Two-Body Problem on Pencil of Lines	Kirpichnikova N.Ya., Fadeeva S.Yu., Philippov V.B.	Diffraction of Surface Waves on a Vertical Interface
12¹⁵ – 12³⁰	Reserved		Reserved	

12³⁰ – 14³⁰

LUNCH

DIFFRACTION PROBLEMS FOR THE DETECTION OF MAN-MADE OBJECTS HIDDEN IN COMPLEX ENVIRONMENTS (I) <i>Chair: Babich V.M.</i> Main Hall		NONLINEAR WAVES & PULSES (I) <i>Chair: Makin V.S.</i> Hall 311		
14 ³⁰ – 14 ⁵⁰	Katsav M., Heyman E.	Beam Summation Analysis of Half Plane Diffraction	Rezaev R.O., Trifonov A.Yu., Shapovalov A.V.	One-Dimensional Nonlinear FPK Equation with the Potential of a Special Form in Semiclassical Approximation
14 ⁵⁰ – 15 ¹⁰	Gluk Y., Heyman E.	Pulsed Beam Expansion of Transient Radiation	Trifonov A.Yu., Rezaev R.O., Shapovalov A.V.	Symmetry Operators for the Multidimensional FPK Equation with Quadratic Nonlocal Nonlinearity
15 ¹⁰ – 15 ³⁰	Daniele V., Graglia R.D.	Diffraction of a Perfectly Conducting Half- Plane Immersed in a Gyrotropic Medium	Belov V.V., Smirnova E.I.	Semiclassical Soliton-Type Solutions of the Hartree Equation
15 ³⁰ – 15 ⁵⁰	Uslenghi P.L.E.	Electromagnetic Signature of a Metallic Disk-Sphere	Fedorov S.V., Rosanov N.N., Veretenov N.A.	Complexes of Weakly Coupled 3D-Laser Solitons

15⁵⁰ – 16²⁰

COFFEE BREAK

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Main Hall

		DIFFRACTION PROBLEMS FOR THE DETECTION OF MAN-MADE OBJECTS HIDDEN IN COMPLEX ENVIRONMENTS (II) <i>Chair: Uslenghi P.L.E.</i> Main Hall	ACOUSTIC & ELASTIC WAVES (I) <i>Chair: Kouzov D.P.</i> Hall 311	
16 ²⁰ – 16 ⁴⁰	Daniele V., Lombardi G.	Factorization of Wiener-Hopf Matrices Using Fredholm Integral Equations	Shatalov M., Joubert S.V., Pretorius W.E., Fedotov I.	Vibrations of Inhomogeneous Solid Discs Subjected to an Inertial Rotation
16 ⁴⁰ – 17 ⁰⁰	Babich V.M.	Direct Proof of Factorability of Lipschitz Matrix-Functions on R^1	Joubert S.V., Shatalov M., Coetzee C.E., Fedotov I.	Vibrations of a Rotating Solid Elastic Sphere Filled with an Inviscid Fluid
17 ⁰⁰ – 17 ²⁰	Grikurov V.E.	Windowed Oscillatory Integral: Gaussian Beams Method Beyond Its Limitations	Joubert S.V., Fay T.H., Shatalov M.	Dynamics of a Vehicle-Trailer System With a Limited Power Supply
17 ²⁰ – 17 ⁴⁰	Boag A.	Non-Uniform Grid (NG) Based Compression of the Method of Moments Matrices	Kloppers P.H., Fay T.H., Joubert S.V.	Probabilistic Approach to Bi-Variate Function Approximation
17 ⁴⁰ – 18 ⁰⁰	Graglia R.D., Lombardi G.	A Modified Euler Transformation for Machine Precision Evaluation of Potential Integrals	Aghayan K.L.	Plane Shear Wave Diffraction in a Composite Elastic Medium with Partially Bonded Elastic Strip

Wednesday, May 30, 2007

St.Petersburg Branch of Steklov's Math. Inst.
(27 Fontanka Quay, downtown)

	URBAN PROPAGATION		METAMATERIALS (I)	
	Chair: <u>Main Hall</u>		Chair: <u>Gabitov I.</u>	
9⁰⁰ - 9³⁰	Tajvidy A., Ghorbani A., Nasermoghaddasi M.	Multiple Diffraction Loss Calculation in Micro-Cell Environments	Veselago V.G.	About Light Pressure in Negative Refraction Materials
9³⁰ - 10⁰⁰	Papkelis E.G., Anastassiu H.T., Frangos P.V.	PO/PTD Near-Field Scattering and Diffraction Method for Path Loss Prediction in Urban Mobile Radio-Systems	Efros A.L.	The Problem of a Perfect Lens Made of a Slab with Negative Refraction
10⁰⁰ - 10³⁰	Shanin A., Shabalina E.	Numerical Study of Diffraction Phenomena in Architectural Acoustics	Vendik I.	Metamaterials Based on Structures with Embedded 3-D Resonant Inclusions

10³⁰ - 11⁰⁰

COFFEE BREAK

Main Hall

ACOUSTIC & ELASTIC WAVES (II) <i>Chair: Lyalinov M.A.</i> <u>Main Hall</u>			METAMATERIALS (II) <i>Chair: Tretyakov S.A.</i> <u>Hall 311</u>	
11 ⁰⁰ – 11 ¹⁵	Kouzov D.P., Solov'eva Yu. A.	Diffraction of Nonstationary Wave with Varying Along the Front Amplitude by a Soft Wedge	Gabitov I., Litchinitser R., Maimistov A.	Nonlinear Phenomena in Optical Metamaterials
11 ¹⁵ – 11 ³⁰	Filippenko G.V.	Vibration of Cylindrical Shell Partially Submerged into the Layer of Liquid. The Liquid Is Inside and Outside the Cylinder		
11 ³⁰ – 11 ⁴⁵	Maximov G.	Biot's Equations for Multiphase Media with Different Temperatures on the Basis of Generalized Variational Principle	McPhee G.J., Stavrinou P.N., Bradley D.D.C.	On Plasmonic and Other Modes of Double Metal-Slab Structures
11 ⁴⁵ – 12 ⁰⁰	Molotkov L.A.	Investigation of Wave Field in Effective Model of Layered Elastic Medium with Slide Contact on Interfaces		
12 ⁰⁰ – 12 ¹⁵	Sidorov A.A.	Anisotropic Approximation of Radially Layered Elastic Media	Vinogradov A.P., Dorofeenko A.V., Merzlikin A.M.	A Comparative Analysis of Mixing Formula for DNG and SNG Media
12 ¹⁵ – 12 ³⁰	Sturova I.V.	The Scattering of the Localized Surface Wave by an Elastic Plate Floating on Shallow Water of Variable Depth		

12³⁰ – 14³⁰**LUNCH**

MATHEMATICAL MODELING IN NON-LINEAR WAVE AND PATTERN FORMATION (I)			METAMATERIALS (III)	
<i>Chair: Samsonov A.M.</i>			<i>Chair: Vinogradov A.P.</i>	
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14 ³⁰ – 15 ⁰⁰	Feng J., Shcherbina M., Tirozzi B.	Dynamical behavior of a large complex system	Fedotov V.A., Zheludev N.I., Mladyonov P.L., Prosvirnin S.L.	Electromagnetic Properties of Double-Periodic Planar Chiral Array
15 ⁰⁰ – 15 ¹⁵	Brüning J., Dobrokhotov S.Yu., Nekrasov R.V., Shafarevich A.I.	Propagation of the Wave Packets in Thin Tube with Nonlinear Integral Potential	Merzlikin A.M., Vinogradov A.P., Dorofeenko A.V.	Distinct Feature of Magneto Photonic Crystals on Formation of the Yeh Band Gap
15 ¹⁵ – 15 ⁴⁵	Omel'yanov G.A.	Interaction of Shock Waves for Genuinely Nonlinear Hyperbolic Systems	Dorofeenko A.V., Merzlikin A.M., Vinogradov A.P.	Enhancement of Magneto-Optic Effects with Resonant Structures
			Golovkina M.V.	Waveguide Structure Containing Metamaterial Slab with Resistive Film
15 ⁴⁵ – 16 ⁰⁰	Shelkovich V.M.	Singular Solutions to Systems of Conservation Laws Connected with Transportation and Concentration Processes	Odit M., Vendik I., Vendik O.	3D Isotropic Metamaterial Based on Dielectric Resonant Spheres

16⁰⁰ – 16³⁰**COFFEE BREAK**[Main Hall](#)

MATHEMATICAL MODELING IN NON-LINEAR WAVE AND PATTERN FORMATION (II) <i>Chair: Omel'yanov G.A.</i> Main Hall			METAMATERIALS (IV) <i>Chair: Efros A.</i> Hall 311	
16 ³⁰ – 16 ⁴⁵	Khusnutdinova K.	Nonlinear Waves in Coupled Waveguides	Maslovski S.I.	Reflection from a Half-Space Filled with Wire Medium: the Auxiliary Source Method
16 ⁴⁵ – 17 ⁰⁰			Nefedov I.S.	Spectra of Modes of Waveguides, Loaded with Wire Media
17 ⁰⁰ – 17 ³⁰	Pavlov M.	Explicit Solutions of Integrable Multi-Dimensional Nonlinear and Quasilinear Equations	Tretyakov S.A., Nefedov I.S.	Transformation of Electromagnetic Fields Using Metamaterials
17 ³⁰ – 17 ⁴⁵	Vakulenko S.A.	Asymptotics for Nonlinear Wave Equations with External Source	Belov P.A., Silveirinha M.G., Simovski C.R., Hao Y.	Subwavelength Imaging at Microwave, Terahertz and Infrared Frequencies
17 ⁴⁵ – 18 ⁰⁰	Tovstik T.	The Waves Propagation in the Composed Rod		

Thursday, May 31, 2007

St.Petersburg Branch of Steklov's Math. Inst.
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MATHEMATICAL ASPECTS OF WAVE PROPAGATION (II) <i>Chair: Krutitskii P.A.</i> Main Hall			PROPAGATION & SCATTERING OF E/M WAVES (I) <i>Chair: Kyurkchan A.G.</i> Hall 311	
$9^{00} - 9^{30}$	Sautbekov S.S.	Solving the Problems of Diffraction by Wiener-Hopf-Fock Method for Finite Fine Structures	Abramochkin E.G., Volostnikov V.G.	Wigner Distribution Function and Intensity Integral Moments of Hermite--Laguerre--Gaussian Beams
$9^{30} - 9^{45}$	Motygin O.V.	On Uniqueness in the Two- and Three-Dimensional Neumann-Kelvin Problem	Es'kin V.A., Kudrin A.V., Zaboronkova T.M.	Excitation of Whistler Modes Guided by a Lossy Anisotropic Plasma Cylinder
$9^{45} - 10^{00}$	Kirpichnikova A.	Uniqueness Inverse Boundary Spectral Problem for Riemannian Polyhedra	Zvyagintsev A.A., Ivanov A.I., Katkov D.V.	Whispering Gallery Eigenmodes of a Surface with Anisotropic Surface Impedance
$10^{00} - 10^{15}$	Damaskinsky E.V., Borzov V.V.	Bessel Oscillator	Ivakhnychenko M.V., Veliev E.I., Ahmedov T.M.	Fractional Boundary Conditions in Diffraction Problems on Plane Screens
$10^{15} - 10^{30}$	Sitnik S.M.	Explicit Solutions to a Singular Differential Equation with Bessel Operator	Vozianova A.V., Nerukh A.G.	Resolvent Operator of Maxwell Equations for 6-Dimensional Field Vector

$10^{30} - 11^{00}$

COFFEE BREAK

[Main Hall](#)

MATHEMATICAL ASPECTS OF WAVE PROPAGATION (III) <i>Chair: Sautbekov S.S.</i>		PROPAGATION & SCATTERING OF E/M WAVES (II) <i>Chair: Zaboronkova T.M.</i>		
		<u>Main Hall</u>	<u>Hall 311</u>	
11 ⁰⁰ – 11 ³⁰	Acho T.M.	Derivation of Eigenvalues for the Sturm-Liouville Boundary Value Problem with Interior Singularities	Kyurkchan A.G., Manenkov S.A., Negorozhina E.S.	Modelling of Scattering Characteristics of Electromagnetic Waves by Group of Bodies Using the Modified Method of Discrete Sources
11 ³⁰ – 11 ⁴⁵	Kucherenko V.V.	Semiclassic Asymptotics for the Vector Sturm-Liouville Problem with Parameters	Kyurkchan A.G., Skorodumova E.A.	Modeling the Characteristics of Scattering of Electromagnetic Waves by the Bodies of Complex Geometry
11 ⁴⁵ – 12 ⁰⁰	Krutitskii P.A.	Boundary Value Problems for the Helmholtz Equation in Domains Bounded by Closed Curves and Open Arcs	Bogomolov Ya.L., Semenov E.S., Yunakovskiy A.D.	Optimization of Paraxial Region for Quasi-Optical Electron Accelerator
12 ⁰⁰ – 12 ¹⁵			Vinokurov A.A.	Analysis of Applicability Ranges of Exact Light Scattering Methods Using Spherical Basis
12 ¹⁵ – 12 ³⁰	Chernitskii A.A.	Effective Riemann Space for Wave Propagation in Nonlinear Electrodynamics	Borisov V.V.	The Transient Waves Produced by Hyperbolic Motion of Gaussian's Transverse Sources

12³⁰ – 14³⁰**LUNCH**

ASYMPTOTIC METHODS IN TSUNAMI AND TYPHOON PROBLEMS			NONLINEAR WAVES & PULSES (II)	
<i>Chair: Tirozzi B., Grikurov V.E.</i>			<i>Chair: Konyukhova N.B.</i>	
<u>Main Hall</u>			<u>Hall 311</u>	
14 ³⁰ – 15 ⁰⁰	Dobrokhotov S.Yu., Shafarevich A.I., Tirozzi B.	One Representation of Localized Functions via the Maslov Canonical Operator and its Application to Asymptotic Solutions of Linear Hyperbolic Systems	Makin V.S., Makin R.S., Guo C., Vorobyev A.Y.	Universality of Feigenbaum and Dissipative Microstructures for Highly Nonequilibrium Nonlinear Systems
15 ⁰⁰ – 15 ¹⁵	Dobrokhotov S.Yu., Zhevandrov P., Tirozzi B.	Asymptotic Theory of the One Dimensional Linear Scattering of the Solitary Waves on a Beach	Zon V.B.	Reflection, Refraction and Transformation into Photons of Surface Plasmons on Metal Wedge
15 ¹⁵ – 15 ³⁰			Smirnov Yu., Sysova E.	Analysis of the TE-Wave Propagation in Nonlinear Dielectric Three-Layer Planar Waveguides with Non-Kerr Nonlinearity
15 ³⁰ – 15 ⁴⁵	Dobrokhotov S.Yu., Sinitsyn S.O.	Localized Asymptotic Solutions of 1D Wave Equation with Variable Velocity Implied by Time-Dependent Source	Kozlov S.A., Petroshenko P.A.	The Nonparaxial Self-Focusing of Few-Cycle Light Pulses in Dielectric Media with Dispersion
15 ⁴⁵ – 16 ⁰⁰	Sekerzh-Zenkovich S., Volkov B.I.	On Application of Asymptotic Solutions to Calculation of Tsunami Piston Model	Shpolyanskiy Yu.A., Berkovsky A.N., Berlin M.A., Kozlov S.A.	Self-Focusing of Few-Cycle Light Pulses in Transparent Dispersive Optical Media with Electronic And Electronic-Vibration Cubic Nonlinearities
16 ⁰⁰ – 16 ³⁰	Bianchi D., Raicich F.	Stability of Perturbation of Flows and Typhoon Generation	Arakelyan M.M., Avetyan K.T., Nazaryan E.A.	Features of Propagation and Interaction of One-Dimensional Topological Solitons in Crystals
			Yatsyk V.V.	The Problem of Diffraction of a Plane Electromagnetic Wave on a Kerr-type Nonlinear Dielectric Layered Structure

16³⁰ – 17⁰⁰**COFFEE BREAK**

WAVELET ANALYSIS			WAVEGUIDES & QUANTUM WAVEGUIDES	
<i>Chair: Graglia R.D.</i>			<i>Chair: Andronov I.V.</i>	
<u>Main Hall</u>			<u>Hall 311</u>	
17 ⁰⁰ – 17 ¹⁵	Athanassoulis A.G.	Smoothed Wigner Transforms and Homogenization of Wave Propagation	Ishio H.	An Attempt to Improve Semiclassical Calculations of Wave Transport in a Quantum Wire with Diffraction
17 ¹⁵ – 17 ³⁰			Belov V.V., Nikolaev S.V.	Integrable Models of the Longitudinal Motion of Electrons in Curved 3D-Nanotubes
17 ³⁰ – 17 ⁴⁵	Perel M.	Solution of the Initial-Boundary Value Problem for the Wave Equation in the Half-Space Based on Affine Poincare Wavelets	Shereshevskii I.A.	The Scattering Operator in the Stepwise Waveguides
17 ⁴⁵ – 18 ⁰⁰	Sidorenko M., Perel M.	Exact Integral Representation of the Solution of the Wave Equation Based on the Continuous Wavelet Analysis	Kovalev M.D.	The Number of Energy Levels in MQW-Structure

Friday, June 1, 2007

Inst. on Physics of St.Petersburg Univ.
(Petrodvoretz campus)

**Departure of bus to the Petrodvoretz campus:
8⁴⁵, 27 Fontanka Quay (in front of Math.Inst.)**

PLENARY SESSION

Chair: *Kiselev A.P.*

[Conference Hall](#)

10 ⁰⁰ – 10 ⁴⁵	Chernyak V., Chertkov M., Gabitov I. , Kolokolov I., Kueppers F., Lebedev V., Shkarayev M.	Large Deviation Approach for Study of Errors in Fiber Communication Systems
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10⁴⁵ – 12¹⁵ POSTER SESSION AND COFFEE

[Entrance Hall](#)

Abdulkadyrov V.A., Abdulkadyrov D.V.	The Diffraction and Dispersion of Waves in Semiconductor-Diffraction Grating Structure	Bagdov A.G., Vardanyan A.V., Vardanyan S.V., Martirosyan A.N.	The Analytic and Numerical Solution of Second Thirith, Fourth and Sixth Order Wiener-Hopf System for Mixed Boundary Elasticity Dynamic Problems
Balaban M.V., Altintas A.	Application of Abel's Integral Transform to Solving the Electromagnetic Wave Diffraction by a Thin Disk	Boruhovich S.P.	Planar and Three-Dimensional Chirality Measure Model
Bronnikov V.I.	Diffractive Model of Scattering by a Rough Surface	Byelobrov V.O., Nosich A.I.	Dependences of Lasing Thresholds for a Layered Structure with a Quantum Well on the Mode Symmetry
Chaplygin A.A., Sergeev V.I.	On the Information Transmission Method Using Material Objects' Far-Action Reaction on the External Electromagnetic Unconverted Influence	Donets I.V., Lerer V.A., Lerer A.M., Tsvetkovskaya S.M.	Investigation of Multilayered and Multislot Resonant and Periodical Structures
Gorbatsevich F.F.	Depolarization of Shear Waves in Anisotropic Heterogeneous Media	Ilyushin Ya.A.	The Impact of the Small Scale Fluctuations of the Ionospheric Plasma on the Ultra Wide Band Orbital Ground Penetrating Radar Measurements

Kiselev A.I.S., Kiselev A.N.S., Rosanov N.N.	Effect of Kerr Nonlinearity on Discrete Dissipative Optical Solitons	Kiselev Yu.V., Troyan V.N.	The Diffraction Tomography and Iterative Approach to Restore the Elastic Parameters and Electrical Conductivity
Kryvko A., Kucherenko V.V.	Asymptotic Solution of Linear System with a Turning Point of High Order	Kyurkchan A.G., Smirnova N.I.	Methods of the Continued Boundary Conditions and the Pattern Equations
Kyurkchan A.G., Demin D.B.	Solution Scattering Problems of Electromagnetic Waves from Inhomogeneously Layered Scatterers Using Pattern Equation Method	Litvinets F.N., Trifonov A.Yu., Shapovalov A.V.	Berry Phases for the Hartree Type Equation
Mahillo-Isla R., Gonzalez- Morales M.J., Dehesa-Martinez C.	Diffraction of 2D Complex Beams by a Perfect Conductor Half-Plane: A Spectral Approach	Makin R.S.	Gap Condition for Nonlinear Evolution Equations
Makin R.S.	Averaging and Chaotic Modes for Nonautonomic Nonlinear Dynamic Systems	Makin R.S.	The Number of Zeroes in Invariant Manifolds for Evolution Equations
Makin V.S., Vorobyev A.Y.	Model for the Regular Nanostructuring of Transparent Dielectrics and Semiconductors by Femtosecond Laser Radiation	Makin V.S., Trubaev V.V.	The Comparison of Fields Excited by Input Grating Coupler with those of SEW
Prozorov K.V., Krutitskii P.A.	The Mixed Value Problem with the Skew Derivative for the 2-D Helmholtz Equation Outside Cuts	Radchenko V.V.	Two-Layer Spherical Dielectric Lens with Reflector Excited by a Radial Electric Dipole
Sakhnenko N., Nerukh A.G.	Electromagnetic Field Transformation in Circular Waveguiding and Resonant Structures with Time-Varying Permittivity	Simonenko I.I.	Transient Waves Produced by a Spherical Source Pulsating with Different Periods
Smirnov Yu., Valovik D.	Analysis of the TM-Wave Propagation in Nonlinear Dielectric Layer Planar Waveguides with Kerr Nonlinearity	Smotrova E.I., Nosich A.I., Benson T.M., Sewell P.	Lasing Spectra and Thresholds of a Circular Microcavity Laser Embedded in an Annular Bragg Reflector
Strakov I.A.	Singularities of the Point Source Field in Periodic Structures	Tran X.Tr., Rosanov N.N.	Interaction of Dissipative Fiber Bragg Solitons
Utkin A.B.	Pulsed Radiation Produced by a Travelling Exponentially Decaying Bipolar Current Pulse with High-Frequency Filling	Valiev F.F.	Pulse Shape of Current, Moving Along a Straight Line with Superlight Velocity, and Time Derivative of Whittaker Potential in Far Region
Yalunin S.	Casimir Effect and Exactly Integrable Hamiltonians	Yanson Z.A.	On the Asymptotics of Rayleigh Type Waves in the Case of Singular Propagation Directions on the Surface of an Anisotropic Elastic Body
Yashina N.F., Zaboronkova T.M.	Electromagnetic Surface Waves Guided by the Metal-Composite Medium Boundary	Borovikov V.A., Popov A.L., Chelubeyev D.A.	Sound Field, Excited by Flexural Oscillations of Elastic Plate with Round Inclusion (Part 2)

PLENARY SESSION (continued)		
Chair: <i>Kiselev A.P.</i>		
12¹⁵ – 13⁰⁰	<u>Konyukhova N.B.</u> , Lima P.M., Morgado M.L., Soloviev M.B.	Singular Nonlinear Boundary Value Problem for Bubble–Type or Droplet–Type Solutions in Nonlinear Physics Models
	CLOSING	

[Conference Hall](#)**13⁰⁰ - 14³⁰ LUNCH****14³⁰ - 18⁰⁰ EXCURSION**[Petrodvoretz Gardens](#)**18⁰⁰ - ? PICNIC PARTY**[Woods near the campus](#)

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