Annual International Conference

Days on Diffraction 2010

June 8 – 11, 2010

St.Petersburg

Program

8.30 **Registration & Coffee**

9.30 **Opening (Main Hall)**

	Asymptotic methods I (Main Hall) Chair: A.M. Il'in	***Seismic waves*** (Hall 311) Chair: E.V. Glushkov
9.50	S.Yu. Dobrokhotov: Abstract approach and explicit asymptotic solutions of 2-D wave equation with variable velocity and localized right-hand side	M.M. Popov: True amplitude depth migration by Gaussian beam summation method
10.10	D.S. Minenkov: On the phase shift in the Kuzmak-Whitham method for nonlinear problems	M.A. Geyer: Calculation of synthetic seismograms by summation of gaussian beams of a given width
10.30	V.V. Zalipaev: Semiclassical analysis of conductance fluctuations in open electronic resonators	M.P. Kutovenko, M.I. Protasov: Gaussian beams based true-amplitude imaging: multi-component surface data from volumetric sources
10.50	A.A. Ershov: Asymptotics of the solution to the mixed boundary elliptic problem	G.A. Maximov, V.A. Larichev: Shear viscosity like a consequence of angular momentum relaxation at hydrodynamical description

11.20 **Coffee Break**

	Asymptotic methods II (Main Hall) Chair: S.Yu. Dobrokhotov	***Wavelets*** (Hall 311) Chair: M.V. Perel
11.40	G.V. Sandrakov: Asymptotic methods for some hydrodynamics problems with rapidly oscillating data	M. Ilyasov: Seismic Migration in Terms of Locally Supported Wavelets
12.00	V.M. Shelkovich: Multidimensional zero-pressure gas dynamics with the energy conservation law	V.F. Kravchenko, D.V. Churikov: Radial atomic functions in digital signal processing
12.20	E. Lakshtanov: High-frequency upper and lower bounds for the total cross section in scattering by obstacles	V.F. Kravchenko, D.V. Churikov: New analytical WA-systems of Kravchenko functions
12.40	M.G. Zeitouny, M. Cui, N. Bhattacharya, H.P. Urbach, S.A. van den Berg, A.J.E.M. Janssen: Stationary phase based asymptotic analysis of inter-pulse interference from a frequency comb source in dispersive media	V.F. Kravchenko, O.V. Kravchenko, A.R. Safin: Atomic and R-functions in p-adic analysis theory

13.00 **Lunch**

	Diffraction I (Main Hall) Chair: A.D. Rawlins	***Spectral theory methods I*** (Hall 106) Chair: A. Badanin
15.00	P.L.E. Uslenghi: Exact radiation from an antenna on an oblate metallic spheroid coated with layers of isorefractive and anti-isorefractive materials	R. Gadyl'shin: On Laplacian in domain perforated along the boundary
15.20	A. Chrysostomou, I. Zorbas, E. Papkelis, P. Frangos: Radio coverage simulation for three-dimensional urban environment using physical optics, physical theory of diffraction and the near-to-far-field transformation method	A. Il'in, E. Postnikova, S. Dolbeeva: The singular boundary problem for elliptic equation
15.40	S. Kanaun: Diffraction of monochromatic electromagnetic waves on 3D-dielectric bodies of arbitrary shapes	I.S. Lobanov, V.Yu. Lotoreichik, I.Yu. Popov: Lieb-Thirring inequality for Schrödinger operator with δ-potential on a loop
16.00	V.Yu. Valyaev, A.V. Shanin: Derivation of modified Smyshlyaev's formulae using integral transform of Kontorovich-Lebedev type	I.Yu. Popov, A.I. Trifanov: Model of point-like opening for Maxwell operator

16.20 **Coffee Break**

	Wave Beams (Main Hall) Chair: P.L.E. Uslenghi	***Spectral theory methods II*** (Hall 311) Chair: D.I. Borisov
16.40	A.B. Plachenov: Explicit formulae for higher modes of a nonplanar cavity with odd number of mirrors	A. Badanin, E. Korotyaev: Spectral estimates for periodic fourth order operators
17.00	A.P. Kiselev, A.B. Plachenov: Exact Gaussian localized waves via paraxial solutions	G.A. Chechkin: Thick junction with concentrated masses
17.20	G.N. Borzdov, I.A. Timoshchenko: Comparison of vectorial laser beams radiation pressure on two-level and (1+3)-level neutral atoms	V.F. Kravchenko, O.V. Kravchenko, A.R. Safin: Atomic functions and spectral operators theory in quantum scattering problems
17.40	S. Orlov, U. Peschel, G. Leuchs: Analytical expansion of highly focused optical beams into vector spherical harmonics	

	Diffraction II (Hall 311) Chair: V.M. Babich	***Acoustic waves I*** (Hall 106) Chair: A. Bhaskar	***Cloaking*** (Main Hall) Chair: C. Simovski
9.00	A.V. Shanin: Weinstein's problem with double set of screens: Matrix Wiener-Hopf approach and ODE approach		S.A. Tretyakov: Possibilities of Cloaking and Invisibility at Microwaves
9.20	A.D. Rawlins: High frequency diffraction of an electromagnetic plane wave by an imperfectly conducting rectangular cylinder	D.A. Prikazchikov, J. Kaplunov, E. Nolde: Application of the Rayleigh wave model to a moving load problem	
9.30			Nikolay N. Rosanov: Towards dynamical metamaterials: electrodynamical relativistic phenomena and invisibility problem
9.40	G. Schmidt: Integral methods for conical diffraction by multi-profile gratings	D.D. Zakharov: High order asymptotics of the near field, radiated by a normal or angled beam fluid couple ultrasonic transducer, into an elasic plate or a half-space	
10.00	E.A. Spence: Coercivity of boundary integral operators in high frequency scattering	D.D. Zakharov, A.V. Kaptsov: Resonance properties of wave propagation in the heterogeneous composites with nematic coat-ings	C. Argyropoulos, Efthymios Kallos, and Yang Hao: FDTD modelling of transformation electromagnetic based devices
10.20	A. Popov, S. Zapunidi: Transient current source in two-layer medium: time-domain version of Sommerfeld integral	L.A. Molotkov, N.Ya. Kirpich-nikova: Investigation of Rayleigh waves on free curvilinear boundaries of elastic media	
10.30			

10.40 **Coffee Break**

	Plates & Shells (Hall 311) Chair: A. Boström	***Homogenization*** (Main Hall) Chair: D. Felbacq
11.10	T.I. Khabakhpasheva: Elastic shell impact on a thin layer of water	C.R. Simovski, S. A. Tretyakov: On electromagnetic characterization of metamaterials
11.30	M.G. Zhuchkova, D.P. Kouzov: Flexural-gravity wave scattering by heterogeneities in an elastic plate floating on water	
11.40		Odit Mikhail: Tolerable material properties of resonators in all-dielectric bi-spherical metamaterial
11.50	M.A. Mironov, P.A. Pyatakov, A.P. Pyatakov: Sound generated by impact on thin ice	
11.55		S.V. Maly: Homogenization of metamaterials on the basis of average scattering matrixes
12.10	G.V. Filippenko: The nonstationary problem of membrane vibrations, partially submerged into the layer of liquid	A.A. Orlov, A.V. Chebykin, P.A. Belov: Spatial dispersion in multilayered metal-dielectric nanostructures
12.25		D. Morits, C. Simovski: Dynamic extraction of effective material parameters of composites from reflection and transmission coefficient of a single grid
12.30		
12.40		M. Dalarsson, M. Norgren: Lossywave propagation through graded interfaces between RHM and LHM media

12.30 **Lunch**

	Water waves (Hall 311) Chair: N.G. Kuznetsov	***Numerical methods I*** (Hall 106) Chair: A.G. Kyurkchan	***Wire media*** (Main Hall) Chair: S. Tretyakov
14.30	E. Séré, A. Chambolle, C. Zanini: Traveling water waves: a global variational approach	M. Ganesh, S. C. Hawkins: Efficient surface integral algorithms for three dimensional electromagnetic scattering	D. Felbacq, B. Guizal, K. Vynck: Light transport in disordered metamaterials made of nanorods
14.50	J.H. Videman: Existence of edge waves along periodic structures	I.G. Graham: Error estimates for Filon-Clenshaw-Curtis rules for highly-oscillatory integrals	
15.00			A.V. Tyukhtin, E.G. Doilnitsina: Effective permittivity of structure of coated wires
15.10	N.G. Kuznetsov: On the problem of time-harmonic water waves in the presence of a freely floating structure	T. Kim: Hybrid numerical-asymptotic boundary integral method for solving high-frequency acoustic scattering problems.	
15.15			Stanislav I. Maslovski, Mario G. Silveirinha: Spatial dispersion from a quasi-static model: crossing wires and patches
15.30	O.V. Motygin: Surface water waves trapped near submerged cylindrical bodies	I.A. Shereshevskii, I.M. Nefedov: The numerical method for 2D Helmholtz equation in complicated regions	P.A. Belov, S.Yu. Kosulnikov, A.Rahman: Optimal parameters of metallic nanorods arrays for subwavelength imaging
15.45			D. Felbacq, A. Cabuz, G. Bouchitte: Homogenization of arrays of nanorods
15.50	V.V. Bulatov, Yu.V. Vladimirov: Wave dynamics of non-harmonic internal gravity wave in stratified ocean	N.K. Vdovicheva, I.A. Shereshevskii: The numerical calculation of eigen modes of rectangular electrodynamic waveguide with metal partition	
16.00			

16.10 **Coffee Break**

	Resonances (Main Hall) Chair: A.M. Samsonov	***Spectral theory methods III*** (Hall 311) Chair: R. Gadyl'shin	***Meta-particles*** (Main Hall) Chair: P. Belov
16.40	J. Sumaya-Martinez, M. Mayorga-Rojas, O. Olmos-Lopez: A novel Fisher information criterion to study electromagnetic resonances in lamellar gratings	N. Filonov, I. Kachkovskiy: Absolute continuity of the spectrum of the periodic Schrödinger operator in a layer and in a smooth multidimensional cylinder	D.N. Chigrin, C. Kremers, S.V. Zhukovsky: Metallic nanorods dimer: from optical nano-antennas to planar chiral metamaterials
17.00	J. Sumaya-Martinez, M. Mayorga-Rojas, O. Olmos-Lopez: Near field spectrum in the neighborhood of a subwavelength metallic slit at resonant wavelengths	M.Sh. Birman, T.A. Suslina: Homogenization of nonstationary periodic equations	
17.10			A. Radkovskaya: Inter-element coupling in metamaterials
17.20	V.V. Yatsyk: Resonance scattering and generation of the third harmonic by the diffraction of a plane wave on cubically polarisable dielectric layered structure	V.A. Sloushch: Discrete spectrum of periodic Schrödinger operator with non-constant metric in the case of non-negative perturbations	
17.40		D.I. Borisov: On the spectrum of two-dimensional periodic operator with a localized perturbation	Andrea Alù, Nader Engheta: The Paradox of Zero Forward-Scattering in Relation with the Optical Theorem

	Numerical methods II (Hall 106) Chair: N.B. Konyukhova	***Applications and manufacturing of metamaterials*** (Main Hall) Chair: A. Alù
9.00	A.G. Kyurkchan, N.I. Smirnova: Comparison of the T-matrix and the pattern equations methods	S.I. Maslovski, M.G. Silveirinha: Channelling Casimir's force: Ultra-long range Casimir-Polder interactions in uniaxial nanowire composites
9.20	J. Jegorovs: On the extension of the wave based method	
9.30		Dorota A. Pawlak: Self-organization route to metamaterials
9.40	L.I. Goray: Analysis of 2D photonic crystal slabs of any rod shape and conductivity using a very fast conical integral equation method	
10.00	K.N. Bayramkulov: Modeling of magnetic gap by energy balance method	M.K. Khodzitsky, V.O. Danin, S.I. Tarapov: Experimental verification of left-handed properties of manganite-perovskite metamateral in microwave band
10.15		N.V. Ilin, I.G. Kondratiev, A.I. Smirnov: Modes of metallic waveguide with the metamaterial insertion
10.20	V.V. Borzov, E.V. Damaskinsky: Composite model for generalized Chebyshev oscillator	
10.30		

10.40 **Coffee Break**

	Localized waves (Hall 311) Chair: G.N. Borzdov	***Plasmas*** (Hall 106) Chair: A.V. Popov	***Lasers and plasmonics*** (Main Hall) Chair: N. Rozanov
11.10	V.M. Babich: On the concept "pseudofunction" and its application to construct mathematical expressions for waves concentrated in small neighborhood of points, curves and surfaces	T.Yu. Alekhina, A.V. Tyukhtin: Transition radiation of a charge moving in a waveguide with semi-bounded cold plasma	A.K. Sarychev, A. Chipouline, J. Petschulat, T. Pertsch, A. Tünnermann, C. Rockstuhl, F. Lederer, E.V. Kazantseva: An analytical approach for study the spectral properties of a nanosize laser subjected to a random force
11.30	E. Glushkov, N. Glushkova, M. Golub, A. Eremin: Trapped-mode, pass- and gap-band effects in waveguides with obstacles	O.V. Gallyamova, A.I. Slepkov, J.A. Granit: Smith-Purcell radiation resonant regimes in open type waveguide on tori sequence in relativistic diffraction generator	
11.40			S.V. Zhukovsky, D.N. Chigrin: Optical flip-flop in bistable photonic crystal microlasers
11.50	E. Glushkov, N. Glushkova, A. Eremin, R. Lammering, M. Neumann: Lamb wave excitation, propagation and diffraction in laminate composites with obstacles	A.V. Kudrin, N.M. Shmeleva, O.E. Ferencz, T.M. Zaboronkova: Excitation of electromagnetic waves by a pulsed ring current in a magnetoplasma	
11.55			C.Simovski, J. Pniewski, S. Mühlig, C. Rockstuhl: Multifrequency local field enhancement by a metamaterial nanopyramid
12.10	D.E. Syresin, T.V. Zharnikov, V.V. Tyutekin: Properties of quasi-Rayleigh waves near cylindrical cavity subject to surface impedance load	V.G. Lapin: Non-stationary reflection of a nonlinear electromagnetic wave from smoothly non-uniform isotropic plasmas	Y.M. Strelniker *et al* : Manipulating the light transmission through metamaterial films by applying a magnetic or electric field and by changing of nano-structures shapes
12.30			
12.40			G. Kraftmakher, V. Butylkin: Microwave magnetic response of a cut wire based on interaction with surface plasmons

12.30 **Lunch**

	Acoustic waves II (Hall 311) Chair: D.D. Zakharov	***Nonlinear problems*** (Hall 106) Chair: L.M. Kovachev	***High-impedance surfaces and antennas*** (Main Hall) Chair: F. Medina
14.30	A.I. Nazarov, G.L. Zavorokhin: On the existence of the fundamental modes of the wedge guide	E.L. Aero, A.N. Bulygin, Yu.V. Pavlov: New approach to solution of sine-Gordon equation with variable amplitude	O. Luukkonen, C. Simovski, S. Tretyakov: Analytical modeling of artificial impedance surfaces
14.50	A. Boström, K. Mauritsson, P. Folkow: Dynamic equations for an orthotropic plate	A.M. Samsonov: On the new model for protein concentration dynamics in bounded domain	
15.00			P.L. Mladyonov: Electro-magnetic properties of doubly-periodic chiral gratings placed on both surfaces of a dielectric layer
15.10	O. Godin: Anomalous Transparency of Gas-Liquid and Gas-Solid Interfaces for Low-Frequency Sound	N.B. Konyukhova, A.I. Sukov, M.B. Soloviev: Singular non-linear problems for self-similar solutions to the steady-state boundary layer equations with zero pressure gradient	
15.15			Yuehe Ge and Karu P. Esselle: Meeting the phase requirement for an EBG resonator antenna in two bands using a single-band frequency selective surface
15.30	V.A. Gusev: Diffraction of high intensive acoustic wave in the stratified atmosphere	L.M. Kovachev: A class of localized solutions of the linear and nonlinear wave equations	
15.45			A.Alù, S.Maslovski: A simplified analytical model for receiving wire antennas consistent with power conservation
15.50		Yu.A. Shpolyanskiy, A.N. Berkovsky: Temporal and spectral evolution of electric field and complex envelope of few-cycle light pulses experiencing paraxial self-focusing in transparent media	
16.00			
16.10	**Coffee Break**		
	Elastic waves (Main Hall) Chair: O. Godin	***Numerical methods III*** (Hall 106) Chair: I.G. Graham	***Extraordinary transmission and frequency-selective surfaces*** (Main Hall) Chair: O. Luukkonen
16.40	A. Bhaskar: Dynamics of convecting elastic solids	V.A. Abdulkadyrov: The diffraction and dispersion of waves in the space-periodic structure with the 2-dimentional electronic gas	Francisco Medina, Francisco Mesa, Ricardo Marqués: A critical review of extraordinary transmission phenomena
17.00	K.J. Langenberg, R. Marklein, K. Mayer, A. Zimmer: Elastic wave scattering and inverse scattering in anisotropic solid materials	Ya.L. Bogomolov, E.S. Semenov, A.D. Yunakovsky: Resonance mode patterns in the paraxial volume of a quasi-optical electron accelerator	
17.10			A. Ivanov, A. Shalygin, A. Sarychev: Plasmonic extraordinary transmittance
17.20	M.A. Basarab: Solving problems of elastic ring dynamics by the generalized method of eigenoscillations	C. Matsui: Correlation functions of integrable spin chains with boundaries	
17.25			G. Goussetis, A.P. Feresidis, J.L. Gómez-Tornero, C. Mateo-Segura, M. García-Vigueras: Equivalent surface impedance of FSSs and applications
17.40			
17.55			R.Rodríguez-Berral, F.Mesa, F.Medina: Transmission through slit diffraction gratings with dielectric slabs: equivalent circuit model

8.15 Departure of the buses from Mathematical Institute to Petrodvorets

	Plenary Session, Chair: A.P. Kiselev (Conference Hall)
10.00	S.A. Nazarov: Trapped modes in cranked and branched waveguides

10.40 ***Poster session and coffee***

1) V.N. Chukov: On violation of Rayleigh law of scattering in case of subsurface deterministic inhomogeneity
2) V.N. Chukov: Oscillations of scattering in Rayleigh limit
3) V.G. Farafonov, V.B. Il'in, A.A. Vinokurov: Generalized solution to the light scattering problem for axisymmetric particles
4) M.V. Golub, A.Boström: Spring boundary conditions and modeling of 2D wave propagation in composites with imperfect interfaces
5) T.V. Kochubey: Analysis of integro-differential operator of equation for eddy currents in thin conductor
6) V.S. Makin, V.V. Trubaev: Angular dependence and field distribution in pressed wave
7) S. Semenov, T. Statsenko, Yu. Tolmachev: Nonstationary diffraction of a single pulse for a generator of encoded pulse sequence
8) K.S. Shaposhnikov: Use of eigenfunctions of integral operator with weakly singular kernel for a magnetostatic problem solving
9) A.S. Slusarenko, G.N. Dyakova: On a method of metrological self assurance in a problem of control of orbital complexes
10) O. Soldatenko: Active protection from noise propagation in cylindrical waveguide
11) O. Strizhenko, M. Kolmakov: Simulation of a laminar flow in a porous medium
12) Ye. Ryabokon, I. Sukharevsky, A. Altintas: Correction of bore-sight errors induced by a radome
13) A.M. Tagirdzhanov: “Complex source” in two-dimensional real space
14) V.A. Topunov: Surface acoustic waves in a rotating solid
15) E.E. Ushakova, S.N. Kurilkina: Super short Bessel beam Formation by axicon
16) A.B. Utkin: Modal representation of transient waves constrained by an elliptical cylinder
17) N.F. Yashina, T.M. Zaboronkova: Instability of electromagnetic surface waves guided by the hiral column
18) S. Orlov, U. Peschel, P. Banzer, G. Leuchs: Reconstruction of individual electric field components of the highly focused optical beam by the Mie scattering scans
19) G.N. Borzdov, I.A. Timoshchenko: Radiation pressure of vectorial laser beams on (1+3)-level atoms
20) T. Gilles: Diffraction by a dielectric wedge: theory and experiments
21) V.V. Kucherenko: Hyperbolic systems with characteristics of variable multiplicity
22) I. Sukharevsky, A. Altintas, Ye. Ryabokon: PO/GTD method for 3D modeling of the aperture antenna with a radome
23) Valery Butylkin, Galina Kraftmakher, and Valery Mal'tsev: Nonreciprocal transmission of surface microwaves along “ferrite - grating of resonant elements” metasandwiches
24) V.T. Erofeenko, S.V. Maly: Investigation of electrodynamic properties of multilayer structures from biisotropic materials by means of nonlocal bilateral boundary conditions

25) M.V. Golovkina: Two-layered waveguide with superconducting film and metamaterial slab: propagation below cutoff
26) Sergey Moiseev, Sergey Vinogradov: Anti-reflection optical coating with silver nanoparticles
27) A.V. Chebykin, A.A. Orlov, and P.A. Belov: Nonlocal Homogenization Theory Of Multilayered Metal-Dielectric Nanostructured Metamaterials
28) Anton P. Anzulevich, Vasiliy D. Buchelnikov, Igor V. Bychkov: Microwave heat of copper powder with varying particle size
29) A.-o. Ghorbani, A. Ghorbani: Optimal Design of Electromagnetic wave Absorber Based on Propagation Model
30) V.S. Makin, R.S. Makin, I.A. Silantjeva: Qualitative model for nanostructures formation in semiconductor material along femtosecond laser beam direction
31) Marchenko V.F., Zakharova I.G.: Transformation of light beams reflected of a photonic crystal boundary
32) Syresin D.: Properties of quasi-Rayleigh waves near cylindrical cavity subject to surface impedance load

	Plenary Session, Chair: P.A. Belov (Conference Hall)
11.40	Johan Christensen: Acoustic Metamaterials
12.20	A.P. Sukhorukov: Nonlinear diffraction and total internal reflection with interaction of optical beams

13.00 **Lunch**

14.00 **Excursion to Peterhof Gardens**

18.00 **Picnic (see map on the next page)**

Map of the University campus in Petrodvorets and picnic place