Section 11:
Mathematical Physics

Invited Lectures

Wednesday, 19 August **H 1028**

14:00 – 14:45 **Gian Michele Graf,** ETH Zürich, Zürich, Switzerland
Stability of matter in classical and quantized fields *(I: p.134)*
Chair: Volker Bach

15:00 – 15:45 **Barry McCoy,** State University of New York, Stony Brook, USA
Rogers-Ramanujan identities: A Century of progress from mathematics to physics *(I: p.135)*
Chair: Robert Schrader

Wednesday, 19 August **MA 005**

16:15 – 17:00 **Robbert Dijkgraaf (also Section 4),** University of Amsterdam, Amsterdam, The Netherlands
The Mathematics of Fivebranes *(I: p.62)*
Chair: Fedor Smirnov

Thursday, 20 August **H 1028**

16:15 – 17:00 **Jennifer T. Chayes,** Microsoft Research, Redmond, USA
Birth of the Infinite Cluster: Finite-Size Scaling in Percolation *(I: p.130)*
Chair: Jean-Dominique Deuschel

17:15 – 18:00 **Detlev Buchholz,** Universität Göttingen, Göttingen, Germany
Scaling algebras in local relativistic quantum physics *(I: p.129)*
Chair: Gian Michele Graf

Friday, 21 August **H 1028**

14:00 – 14:45 **Fedor Smirnov,** CNRS, LPTHE, Université Pierre et Marie Curie, Paris, France
Space of local fields in integrable field theory and deformed Abelian integrals *(I: p.137)*
Chair: Andreas Fring

15:00 – 15:45 **Roberto Schonmann,** UCLA, Los Angeles, USA
Metastability and the Ising model *(I: p.136)*
Chair: Christian Borgs

Saturday, 22 August **H 1028**

16:15 – 17:00 **Paul S. Aspinwall (also Section 4),** Duke University, Durham, USA
Geometry and String Duality *(I: p.59)*
Chair: Pelham M.H. Wilson

17:15 – 18:00 **Pierre Collet,** CNRS, École Polytechnique, Palaiseau, France
Extended Dynamical Systems *(I: p.130)*
Chair: Roberto Schonmann

Tuesday, 25 August **H 1028**

16:15 – 17:00 **Eugene Bogomolny,** Université Paris Sud, Orsay, France
Spectral Statistics *(I: p.129)*
Chair: Pierre Collet

17:15 – 18:00 **Horng-Tzer Yau,** Courant Institute, New York University, New York, USA
Scaling Limit of Particle Systems, Incompressible Navier-Stokes Equation, and Boltzmann Equation *(I: p.138)*
Chair: Ruedi Seiler

Wednesday, 26 August **H 1028**

14:00 – 14:45 **Antonio Giorgilli,** Università degli Studi di Milano, Milano, Italy
On the problem of stability for near to integrable Hamiltonian systems *(I: p.132)*
Chair: Johannes Kellendonk

Short Communications and Poster Sessions

Short Communications **Wednesday, 19 August**

Many Particle Systems **H 107**
Chair: Gennady Shchepanuk

17:15 – 17:30 **Valeri V. Kucherenko,** Instituto Politecnico Nacional, México D.F., Mexico
Normal forms of quadratic boson operators and theirs spectrum *(p.238)*

17:30 – 17:45 **Christoph Bandt,** Universität Greifswald, Greifswald, Germany
The geometry of a parameter space for interacting particle systems *(p.229)*

17:45 – 18:00 **Gennady Shchepanuk,** Institute of Mathematics of NASU, Kyiv, Ukraine
Almost L_2-exponential mixing for classical continuous systems *(p.245)*

Short Communications **Thursday, 20 August**

Integrable Systems I **H 107**
Chair: Renat Z. Zhdanov

14:00 – 14:15 **Igor Korepanov,** South Ural State University, Chelyabinsk, Russia
Integrability in higher dimensions *(p.238)*

14:15 – 14:30 **Iordan P. Michev,** RIMS, Kyoto University, Kyoto, Japan
On the Fay identity for Kdv tau functions and the identity for the Wronskian of squared solutions of Sturm-Liouville equation *(p.240)*

14:30 – 14:45 **Renat Z. Zhdanov,** Institute of Mathematics, Kyiv, Ukraine
On classification of separable (2+1)-dimensional Schrödinger equations *(p.246)*

Statistical Mechanics **H 107**
Chair: Ali E Özlük

15:00 – 15:15 **Daniel Marinov Danchev,** Bulgarian Academy of Sciences, Sofia, Bulgaria
FSS Properties of an Exactly Solvable Quantum Model *(p.231)*

15:15 – 15:30 **Valentina Goloubeva,** All-Russian Institute of Sci. and Techn. Inf., Moscow, Russia
On algebraic similarity of Calogero and Sutherland models *(p.234)*

15:30 – 15:45 **Ali E Özlük,** University of Maine, Orono, USA
A Farey Fraction Spin Chain *(p.242)*

Short Communications — Friday, 21 August

Spectral Analysis I — **H 107**
Chair: George D. Raikov

16:15 – 16:30	**Hermann Schulz-Baldes,** TU Berlin, Berlin, Germany *Quantum dynamics in presence of fractal spectra*	*(p.245)*
16:30 – 16:45	**Michael Demuth,** TU Clausthal, Clausthal, Germany *Stable absolutely and singularly continuous spectra due to integral conditions*	*(p.232)*
16:45 – 17:00	**George D. Raikov,** Bulgarian Academy of Sciences, Sofia, Bulgaria *Eigenvalue asymptotics for the Dirac operator in strong constant magnetic fields*	*(p.243)*

Thermodynamcis, Hydrodynamcis, Non-linear Dynamics I — **H 1029**
Chair: Volodymyr Kotlyarov

16:15 – 16:30	**Xinyu He,** University of Warwick, Coventry, Great Britain *A probabilistic method for vortex motion in turbulent fluids*	*(p.235)*
16:30 – 16:45	**Vladyslav V. Danishevs'kyy,** Prydniprovska State Ac. of Civ. Eng., Dnipropetrovsk, Ukraine *A New Asymptotic Technique for Nonlinear Dynamic Boundary Value Problems*	*(p.231)*
16:45 – 17:00	**Volodymyr Kotlyarov,** Institute for Low Temperature Physics, Kharkov, Ukraine *Scattering problem for compatible ordinary differential equations and nonlinear Schrödinger equation on the semi-axis*	*(p.238)*

Spectral Analysis II — **H 107**
Chair: Andrey V. Tchourkin

17:15 – 17:30	**Mark M. Malamud,** Donetsk State University, Donetsk, Ukraine *Inverse spectral analysis for first order systems*	*(p.240)*
17:30 – 17:45	**Richard L. Hall,** Concordia University, Montreal, Quebec, Canada *Geometric spectral inversion*	*(p.235)*
17:45 – 18:00	**Andrey V. Tchourkin,** Moscow State University, Moscow, Russia *Quantum stochastic model of gravitational wave interferometer detector*	*(p.246)*

Short Communications — Saturday, 22 August

Field Theory I — **H 107**
Chair: Pierre Mathieu

14:00 – 14:15	**Robert W. Carroll,** University of Illinois, Urbana, IL, USA *On Whitham dynamics and renormalization*	*(p.230)*
14:15 – 14:30	**Andrei G. Bytsko,** Steklov Mathematics Institute, St. Petersburg, Russia *On factorized Virasoro characters*	*(p.230)*
14:30 – 14:45	**Andreas Fring,** Freie Universität Berlin, Berlin, Germany *Lie Algebraic Structures from Factorized Virasoro Characters*	*(p.233)*

Discrete Eigenvalue Theory — **H 1029**
Chair: Miodrag Perovic

14:00 – 14:15	**Miodrag Perovic,** University of Montenegro, Podgorica, Yugoslavia *Some Comments Concerning the Application of the Discrete Eigenvalue Theory*	

Field Theory II — **H 107**
Chair: Robert W. Carroll

15:00 – 15:15	**Pierre Mathieu,** Université Laval, Québec, Canada *Generating functions for fusion rules*	*(p.240)*
15:15 – 15:30	**Moukadas Missarov,** Kazan State University, Kazan, Russia *Critical phenomena and continuum limit in the hierarchical fermionic model*	*(p.240)*
15:30 – 15:45	**Michael Monastyrsky,** Institute of Theoretical & Experimental Physics, Moscow, Russia *Correlation functions on Riemann surfaces and statistics of Knots*	*(p.241)*

Short Communications — Monday, 24 August

Geometry, General Relativity — **H 107**
Chair: Akira Asada

14:00 – 14:15	**Mohamed Abdel-Megied,** Minia University, El-Minia, Egypt *Conformal Singularities*	*(p.227)*
14:15 – 14:30	**Paula B. Cohen,** CNRS, Lille, France *Siegel's Lemma, Padé Approximations and Jacobians*	*(p.230)*
14:30 – 14:45	**Akira Asada,** Sinsyu University, Matumoto, Japan *Clifford bundles over mapping spaces*	*(p.228)*

Thermodynamics, Hydrodynamics, Non-linear Dynamics II — **H 1029**
Chair: Burkhard J. Schmitt

14:00 – 14:15	**Alexander Zlotnik,** Moscow Power Engineering Institute, Moscow, Russia *Global weak solutions to the equations of one-dimensional motion of a viscous heat-conducting gas with nonsmooth data*	*(p.247)*
14:15 – 14:30	**Yoshimitsu Iwasaki,** Okayama University of Science, Okayama, Japan *Axiomatic theory of the multiple anelastic relaxation in crystalline solids*	*(p.235)*
14:30 – 14:45	**George Jaiani,** Tbilisi State University, Tbilisi, Republic of Georgia *A Mathematical Model of Bars with Variable Rectangular Cross-section*	*(p.236)*

Symmetries and Mathematical Methods in Physics — **H 107**
Chair: Vladimir V. Kisil

15:00 – 15:15	**C. Martha Banulescu,** Association "Nicolae Balescu", Bucharest, Romania *Lie Groups in Physics*	*(p.229)*
15:15 – 15:30	**Malgorzata Klimek,** Technical University of Częstochowa, Częstochowa, Poland *Conserved Currents for Linear Equations of Motion in Discrete and Non-commutative Models*	*(p.237)*
15:30 – 15:45	**Vladimir V. Kisil,** Odessa State University, Odessa, Ukraine *Feynman Path Integral, Umbral Claculus, and Non-Commutative Combinatorics*	*(p.237)*

Thermodynamics, Hydrodynamics, Non-linear Dynamics III — **H 1029**
Chair: Alexander Zlotnik

15:00 – 15:15	**Burkhard J. Schmitt,** RWTH Aachen, Aachen, Germany *On upper bounds for the energy dissipation rate in turbulent shear flow*	*(p.244)*
15:15 – 15:30	**Lev L.D. Pustylnikov,** Universität Bielefeld, Bielefeld, Germany *Poincare models, rigorous justification of the second law of thermodynamics on the basis of mechanics, and the Fermi acceleration mechanism*	*(p.243)*
15:30 – 15:45	**Andrey B. Morgulis,** Rostov University, Dept. of Math., Rostov-na-Donu, Russia *Асимптотика высокочастотных колебаний идеальной жидкости, протекающей сквозь канал конечной длины*	*(p.241)*

Short Communications — Tuesday, 25 August

q-Deformation, Quantization — **H 107**
Chair: Markus J. Pflaum

14:00 – 14:15	**Hitoshi Konno,** Hiroshima University, Higashi-Hiroshima, Japan *Elliptic quantum groups*	*(p.237)*
14:15 – 14:30	**Andreas Ruffing,** University of Munich, München, Germany *On Schrödinger-Hermite Operators in Lattice Quantum Mechanics*	*(p.243)*
14:30 – 14:45	**Markus J. Pflaum,** Humboldt–Universität, Berlin, Germany *Remarks on the quantization of stratified symplectic manifolds*	*(p.242)*

Mathematical Methods in Physics I Chair: Mikhail Brodsky	**H 1029**
14:00 – 14:15 **Boris V. Loginov,** Ulyanovsk State Technical University, Ulyanovsk, Russia *Bifurcation theory methods in the problem about capillary-gravity waves in spatial layer of floating fluid*	*(p.239)*
14:15 – 14:30 **Nina F. Golovanova,** The Moscow State Textile Academy, Moscow, Russia *Eiconal expansion solution for T-matrix equation and the unitarity condition*	*(p.234)*
14:30 – 14:45 **Anton A. Golovanov,** The Moscow State Textile Academy, Moscow, Russia *Solution of the T-matrixs equation by the eikonal expansion method*	*(p.234)*

Integrable Systems II Chair: Karl-Georg Schlesinger	**H 107**
15:00 – 15:15 **Vitaly Tarasov,** Max-Planck-Institut für Mathematik, Bonn, Germany *q-Hypergeometric solutions of the quantized Knizhnik-Zamolodchikov equation*	*(p.245)*
15:15 – 15:30 **Vladimir Dragovic,** Mathematical Institute SANU, Belgrade, Yugoslavia *Integrable generalizations of classical mechanical systems*	*(p.232)*
15:30 – 15:45 **Karl-Georg Schlesinger,** Erwin Schrödinger Inst. for Mathem. Physics, Vienna, Austria *Quantum geometry by non-abelian cohomology*	*(p.244)*

Mathematical Methods in Physics II Chair: Boris V. Loginov	**H 1029**
15:00 – 15:15 **Mikhail Brodsky,** University of California, Berkeley, CA, USA *A Physicist's Definition of the Schwarz Function*	*(p.229)*
15:15 – 15:30 **Joyati Debnath,** Winona State University, Winona, MN, USA *Associated Transforms Through a Mathematical Software System*	*(p.231)*
15:30 – 15:45 **Andrei Khrennikov,** University of Växjö, Växjö, Sweden *p-adic realization of negative probabilities and Einstein-Podolsky-Rosen paradox*	*(p.236)*

Short Communications — Wednesday, 26 August

Algebraic Methods in Physics Chair: Victor V. Zharinov	**H 107**
15:00 – 15:15 **Andrej V. Bulinskij,** Moscow Institute of Physics, Dolgoprudny, Russia *On dynamical semigroups compatible with states of von Neumann algebras*	*(p.229)*
15:15 – 15:30 **Fernando F. Lledó,** Universität Potsdam, Potsdam, Germany *On some algebraic properties of massless free nets*	*(p.239)*
15:30 – 15:45 **Victor V. Zharinov,** Steklov Mathematical Institute, Moscow, Russia *On derivations of the Heisenberg algebra*	*(p.246)*

Field Theory III Chair: Henrik Petersson	**H 107**
16:15 – 16:30 **Robert Fittler,** FU Berlin, Berlin, Germany *Nonstandard Quantumelectrodynamics*	*(p.233)*
16:30 – 16:45 **Takashi Kimura,** Dept. of Math, Boston University, Boston, MA, USA *Cohomological Field Theories and Tautological Classes*	*(p.236)*
16:45 – 17:00 **Henrik Petersson,** Växjö University, Växjö, Sweden *Properties of analytical maps on infinite dimensional locally convex spaces*	*(p.242)*

Thermodynamics, Hydrodynamics, Non-linear Dynamics IV Chair: Juan M. Alvaro Vilumbrales	**H 107**
17:15 – 17:30 **Sergei Fedotov,** Dept. of Mathematical Physics, Yekaterinburg, Russia *Travelling Waves in a Reaction-Diffusion System with KPP-kinetics*	*(p.233)*
17:30 – 17:45 **Alexander A Alexeyev,** Peoples' Friendship University, Moscow, Russia *Superposition principles for nonlinear partial differential equations in (1+1) dimension*	*(p.227)*
17:45 – 18:00 **Juan M. Alvaro Vilumbrales,** Polytechnic University of Valencia, Valencia, Spain *Cylindrical and spherical problems of Stefan: analytical solutions and numerical estimates*	*(p.228)*

Poster Session **Monday, 24 August**

16:15 – 18:00 **MA 144**

Jack Asavanant, Chulalongkorn University, Bangkok, Thailand
Free-surface flows past a rectilinear object with stagnation points *(p.228)*

Valery Dryuma, Institute of Mathematics, Kishinev, Moldova
Integration of Einstein equation for higher-dimensional space *(p.232)*

Nadja Kutz, Technische Universität Berlin, Berlin, Germany
Discrete Nonlinear Toda Evolution *(p.239)*

David Natroshvili, Georgian Technical University, Tbilisi, Georgia
Direct and inverse problems of fluid-structure interaction *(p.241)*

Jean Ndimubandi, Université du Burundi, Bujumbura, Burundi
The q-Dirac oscillator: the context of radial potentials *(p.242)*

Joachim Rehberg, Weierstraß-Institut, Berlin, Germany
A hybrid semiconductor device model including nanostructures *(p.243)*

Ryuichi Sawae, Okayama University of Science, Okayama City, Japan
An action of Virasoro algebra on the formal loop group solutions of 2d reduced Einstein equations *(p.244)*

Joseph C. Várilly, Universidad de Costa Rica, San José, Costa Rica
Quantum fields over noncommutative tori *(p.246)*