Section 10: Partial Differential Equations

Invited Lectures

Wednesday, 19 August — H 1012

16:15 – 17:00 **Fabrice Bethuel,** Université Paris-Sud, Orsay, France
Recent results for Ginzburg-Landau models *(I: p.121)*
Chair: Dmitri Yafaev

17:15 – 18:00 **Robert R. Jensen,** Loyola University of Chicago, Chicago, USA
Viscosity solutions of elliptic partial differential equations *(I: p.122)*
Chair: Stefan Müller

Thursday, 20 August — H 1012

14:00 – 14:45 **Matei Machedon,** University of Maryland, College Park, USA
Fourier Analysis of Null Forms and Non-linear Wave Equations *(I: p.124)*
Chair: Michael Struwe

15:00 – 15:45 **Frank Eric Merle,** Université de Cergy-Pontoise, Cergy-Pontoise, France
Blow-up Phenomenon For Critical Nonlinear Schrödinger and Zakharov Equations *(I: p.124)*
Chair: Elmar Schrohe

Friday, 21 August — H 1012

16:15 – 17:00 **Gustavo Alberto Ponce,** University of California, Santa Barbara, USA
On nonlinear dispersive equations *(I: p.125)*
Chair: Mikhail Shubin

17:15 – 18:00 **Frédéric Hélein,** CMLA, ENS-Cachan, Cachan, France
Phenomena of compensation and estimates for partial differential equations *(I: p.121)*
Chair: Gunther A. Uhlmann

Saturday, 22 August — H 1012

16:15 – 17:00 **Gunther A. Uhlmann,** University of Washington, Seattle, USA
Inverse Boundary Value Problems for Partial Differential Equations *(I: p.127)*
Chair: Bert-Wolfgang Schulze

17:15 – 18:00 **Mikhail Vasilevich Safonov,** University of Minnesota, Minneapolis, USA
Estimates near the boundary for solutions of second order parabolic equations *(I: p.126)*
Chair: Heinz O. Cordes

Monday, 24 August — H 1012

14:00 – 14:45 **Dmitri Yafaev,** Université Rennes-1, Rennes, France
Scattering theory: some old and new problems *(I: p.127)*
Chair: Volker Enß

15:00 – 15:45 **Hans Lindblad,** University of California at San Diego, La Jolla, USA
Minimal regularity solutions of nonlinear wave equations *(I: p.122)*
Chair: Konrad Gröger

Short Communications and Poster Sessions

Short Communications — Wednesday, 19 August

General Theory — **H 111**
Chair: Massimo Lanza de Cristoforis

14:00 – 14:15	**Wenxiong Chen,** Southwest Missouri State Univ., Springfield, MO, USA *High Order Conformally Invariant Equations*	*(p.200)*
14:15 – 14:30	**Paweł Domański,** A. Mickiewicz University, Fac. of Mathematics & Comp. Sci., Poznań, Poland *Splitting of differential complexes*	*(p.201)*
14:30 – 14:45	**Massimo Lanza de Cristoforis,** Università di Padova, Padova, Italy *Differentiability Properties of the Autonomous Composition Operator in Sobolev Spaces*	*(p.213)*

Elliptic Equations I — **H 110**
Chair: Florin C. Muscalu

14:00 – 14:15	**Evgeni A. Kalita,** Institute of Applied Mathematics and Mechanics, Donetsk, Ukraine *New class of a priori estimates for nonlinear elliptic equations and systems of high order*	*(p.208)*
14:15 – 14:30	**Vladimir A. Kondratiev,** Moscow State University, Moscow, Russia *On Properties of Positive Solutions of Elliptic Equations*	*(p.210)*
14:30 – 14:45	**Florin C. Muscalu,** Brown University, Providence, Rhode Island, USA *A Harnack Type Theorem for Elliptic Systems with L^∞ Coefficients*	*(p.214)*

A Priori Estimates & Asymptotics — **H 111**
Chair: Shuji Watanabe

15:00 – 15:15	**Sergey Frolovitchev,** MTUCI, Moscow, Russia *Multiplicative solution asymptotics for Kolmogorov-Feller equation and asymptotics of the boundary value problems*	*(p.203)*
15:15 – 15:30	**Annegret Glitzky,** WIAS, Berlin, Germany *Electro–reaction–diffusion systems in heterostructures*	*(p.204)*
15:30 – 15:45	**Shuji Watanabe,** Toyota National College of Technology, Toyota-shi, Japan *An embedding theorem of Sobolev type related to a generalized Fourier transform and applications to partial differential equations with singularity*	*(p.224)*

Applied Fluids — **H 110**
Chair: Lizabeth V. Rachele

15:00 – 15:15	**Olaf Schmidtmann,** WIAS Berlin, Berlin, Germany *Stability Problems in Turbo Compressors*	*(p.220)*
15:15 – 15:30	**Lizabeth V. Rachele,** Purdue University, West Lafayette, IN, USA *Inverse Problems for Elastic Media*	*(p.218)*

Short Communications — Thursday, 20 August

Systems I — **H 111**
Chair: Yakov Krasnov

16:15 – 16:30	**Gennadii V. Demidenko,** Sobolev Institute of Mathematics, Novosibirsk, Russia *Systems not of Cauchy–Kovalevskaya type*	*(p.201)*
16:30 – 16:45	**Abduhamid Dzhuraev,** Tajik Academy of Siences, Dushanbe, Tadschikistan *On partial differential equations in the unit ball of $\mathbb{C}^n$, which are singular at the origin and on the boundary*	*(p.202)*
16:45 – 17:00	**Yakov Krasnov,** Bar-Ilan University, Ramat-Gan, Israel *Symmetries of Cauchy-Riemann-Füter Equation*	*(p.211)*

Fluids **H 111**
Chair: Mitsuo Morimoto

17:15 – 17:30	**Song Jiang,** Institute of Applied Physics and Computational Math., Beijing, P.R. China *Large-time behavior of solutions to the equations of a one-dimensional viscous polytropic ideal gas in unbounded domains* *(p.207)*
17:30 – 17:45	**Anatoli Merzon,** Moscow State Pedagogical University, Moscow, Russia *A complete solution of the Ursell problem* *(p.213)*
17:45 – 18:00	**Hiroko Morimoto,** Meiji University, Kawasaki-City, Japan *On the Existence of Steady Navier-Stokes Flow in 2D Tube-like Domain under General Outflow Condition* *(p.214)*

Short Communications — Friday, 21 August

Elliptic Equations II (Singularities & Index Theory) **H 111**
Chair: Vladimir S. Rabinovich

14:00 – 14:15	**Vladimir Borisovich Vasil'ev,** Novgorod State University, Novgorod, Russia *Wave factorization of elliptic symbols* *(p.223)*
14:15 – 14:30	**Igor I. Skrypnik,** Institute of Applied Mathematics and Mechanics NASU, Donetsk, Ukraine *Degree of densely defined $(S)_+$ operators and applications* *(p.222)*
14:30 – 14:45	**Vladimir S. Rabinovich,** Rostov State University, Rostov-na-Donu, Russia *Elliptic boundary value problems in domains with non-Lipschitz singular points* *(p.218)*

Hyperbolic Equations I (Integrable Equations) **H 110**
Chair: Jiahong Wu

14:00 – 14:15	**Igor Anders,** Institute for Low Temperature Physics & Engineering, Kharkov, Ukraine *Long-time asymptotic behaviour of non-decaying solutions of KP-type equations* *(p.198)*
14:15 – 14:30	**Tariel Kiguradze,** Tbilisi I. Javakhishvili State University, Tbilisi, Georgia *On periodic solutions of nonlinear second order hyperbolic equations* *(p.209)*
14:30 – 14:45	**Jiahong Wu,** University of Texas at Austin, Austin, USA *Zero dissipation limits of wave equations* *(p.225)*

PDE and Mathematical Physics **H 111**
Chair: Roland Potthast

15:00 – 15:15	**Johannes Elschner,** WIAS Berlin, Berlin, Germany *Existence, uniqueness, and regularity for solutions of the conical diffraction problem* *(p.203)*
15:15 – 15:30	**Frank Jochmann,** Humboldt–Universität Berlin, Berlin, Germany *Existence and asymptotic behavior of weak solutions of the drift diffusion equations for semiconductors* *(p.207)*
15:30 – 15:45	**Roland Potthast,** University of Göttingen, Göttingen, Germany *On mixed reciprocity relations in inverse scattering* *(p.217)*

Navier-Stokes Equations **H 110**
Chair: Takeyuki Nagasawa

15:00 – 15:15	**Mikhail E. Bogovskii,** Friendship of Nations University of Russia, Moscow, Russia *The problem of global smooth solutions for multidimensional Navier-Stokes equations solved* *(p.199)*
15:15 – 15:30	**Soichiro Katayama,** Wakayama University, Wakayama, Japan *Some semilinear wave equations with nonlinear damping terms* *(p.208)*
15:30 – 15:45	**Takeyuki Nagasawa,** Tohoku University, Sendai, Japan *A new energy inequality and partial regularity for weak solutions of Navier-Stokes equations* *(p.215)*

Short Communications — Saturday, 22 August

Elliptic Equations III (Spectral Theory) — **H 111**
Chair: Tetsutaro T. Shibata

14:00 – 14:15	**Gabriella Bognár,** University of Miskolc, Miskolc, Hungary *On a nonlinear eigenvalue problem*	*(p.198)*
14:15 – 14:30	**Jochen Denzler,** Technische Universität München, München, Germany *Existence of windows with minimal heat diffusion*	*(p.201)*
14:30 – 14:45	**Tetsutaro T. Shibata,** Hiroshima University, Higashi-Hiroshima, Japan *Asymptotic behavior of eigenvalues of nonlinear elliptic two-parameter problems*	*(p.221)*

Systems II — **H 110**
Chair: Joachim Naumann

14:00 – 14:15	**Hakop A. Hakopian,** Gdansk University, Gdansk, Poland *On two partial differential and one algebraic systems*	*(p.205)*
14:15 – 14:30	**Waichiro Matsumoto,** Université de Paris 6, Paris, France *On the Cauchy-Kowalevskaya theorem of Nagumo type for systems*	*(p.213)*
14:30 – 14:45	**Joachim Naumann,** Humboldt–Universität Berlin, Berlin, Germany *Interior Hölder continuity of weak solutions to nonlinear parabolic systems in two spatial dimensions*	*(p.215)*

Hyperbolic Equations II (Shocks, Blow-up, and Other Singular Phenomena) — **H 111**
Chair: Ya-Guang Wang

15:00 – 15:15	**Mehmet Can,** Istanbul Technical University, Istanbul, Turkiye *Blow up of solutions of a quasilinear hyperbolic equation with applications*	*(p.199)*
15:15 – 15:30	**Michael Ruzicka,** Inst. of Applied Mathematics, University Bonn, Bonn, Germany *Electrorheological fluids, an example for systems with non-standard growth*	*(p.219)*
15:30 – 15:45	**Ya-Guang Wang,** Shanghai Jiao Tong University, Shanghai, P.R. of China *Nonlinear Geometrical Optics for Shock Waves*	*(p.224)*

Diffusion Processes — **H 110**
Chair: Natalia I. Grinberg

15:00 – 15:15	**Jack Carr,** Heriot-Watt University, Edinburgh, Scotland *Asymptotic Behaviour of Solutions to a simplified Lifshitz-Slyozov Equation*	*(p.200)*
15:15 – 15:30	**Alexander M. Chebotarev,** Moscow State University, Moscow, Russia *Resolvent theory for quantum dynamical semigroup*	*(p.200)*
15:30 – 15:45	**Natalia I. Grinberg,** Universität Münster, Münster, Germany *Inverse boundary problem for 2D diffusion equation*	*(p.205)*

Short Communications — Monday, 24 August

Elliptic Equations IV (Non-linear Problems) — **H 111**
Chair: Hwai-Chiuan Wang

16:15 – 16:30	**Carsten Ebmeyer,** Universität Bonn, Bonn, Germany *The p-Laplacian under mixed boundary value conditions in multidimensional polyhedral domains*	*(p.203)*
16:30 – 16:45	**Stanislav I. Pohozaev,** Steklov Mathematical Institute, Moscow, Russia *Positive solutions of nonlinear Neumann problems. Application of the global fibering method*	*(p.217)*
16:45 – 17:00	**Hwai-Chiuan Wang,** Tsing Hua University, Hsinchu, China, Taiwan *Semilinear Elliptic Problems in Interior and Exterior Flask Domains*	*(p.224)*

Applied Problems I **H 110**
Chair: Olga S. Rozanova

16:15 – 16:30	**Zhiming Chen,** Academia Sinica, Beijing, China, Peoples Republic of *Adaptive Finite Element Methods for Dynamical GL Vortices in Superconductivity*	*(p.200)*
16:30 – 16:45	**Olga S. Rozanova,** Belgorod State University, Belgorod, Russia *2-D model of atmosphere dynamics: energy balance and some properties of solutions*	*(p.219)*
16:45 – 17:00	**Gregory A. Chechkin,** Moscow State University, Mech & Math, Moscow, Russia *On Behavior of Perforated Bodies with Rapidly Oscillating Surfaces*	

Hyperbolic Equations III (Conservation Laws & Asymptotic Behavior) **H 111**
Chair: Armen Shirikyan

17:15 – 17:30	**Christian Klingenberg,** Universität Würzburg, Würzburg, Germany *Conservation laws with source terms*	*(p.209)*
17:30 – 17:45	**Andrzej Rogowski,** University of Łódź, Łódź, Poland *Existence of space periodic solutions for semi-linear hyperbolic systems*	*(p.218)*
17:45 – 18:00	**Armen Shirikyan,** Moscow State University, Moscow, Russia *Asymptotic behaviour of solutions to second-order hyperbolic equations*	*(p.221)*

Reaction-Diffusion Equations **H 110**
Chair: Klaus Zacharias

17:15 – 17:30	**Gideon A. Ngwa,** University of Buea, Buea, Cameroon *The Effects of Boundary Conditions on Reaction Diffusion Equations*	*(p.216)*
17:30 – 17:45	**Arnd Scheel,** FU Berlin, FB Mathematik, Berlin, Germany *Essential instability of pulses amd bifurcations to modulated travelling waves*	*(p.220)*
17:45 – 18:00	**Klaus Zacharias,** Weierstraß Institute, Berlin, Germany *On a reaction–diffusion system modelling chemotaxis*	*(p.225)*

Short Communications — Tuesday, 25 August

Elliptic Equations V (Fourier and Harmonic Analysis) **H 111**
Chair: Pawel Strzelecki

16:15 – 16:30	**Alip Mohammed,** FB Mathematik und Informatik, FU-Berlin, Berlin, Germany *Riemann problem related to the Shilov boundary*	*(p.214)*
16:30 – 16:45	**Dian K. Palagachev,** University of Chemical Technology and Metallurgy, Sofia, Bulgaria *Oblique derivative problem for uniformly elliptic operators with VMO coefficients and applications*	*(p.216)*
16:45 – 17:00	**Paweł Strzelecki,** Warsaw University, Warsaw, Poland *Regularity for subelliptic p-harmonic maps and the ghost of Hardy spaces*	*(p.222)*

Parabolic Equations **H 111**
Chair: Nicolay Draganov Kutev

17:15 – 17:30	**Helmut Koch,** Humboldt–Universität, Berlin, Germany *Large time regularity of solutions to the porous medium equation*	*(p.210)*
17:30 – 17:45	**Bernd Kawohl,** Universität Köln, Köln, Germany *Image processing and anisotropic diffusion*	*(p.208)*
17:45 – 18:00	**Nicolay Draganov Kutev,** Mathematisches Institut, Köln, Germany *Maximum and comparison principle for anisotropic diffusion*	*(p.212)*

Short Communications — Wednesday, 26 August

PDE and Dynamical Systems — **H 111**
Chair: Alexandre Kometch

14:00 – 14:15	**Andrey Yu. Goritsky,** Moscow State University, Moscow, Russia *Integral manifolds with exponential tracking*	*(p.204)*
14:15 – 14:30	**Jörg Härterich,** FU Berlin, Berlin, Germany *Heteroclinic Orbits Between Rotating Waves in Hyperbolic Balance Laws*	*(p.205)*
14:30 – 14:45	**Alexandre Kometch,** Moscow State University, Moscow, Russia *Attractors for Hamiltonian Nonlinear Wave Equations*	*(p.210)*

Non-linear Theory — **H 110**
Chair: Masafumi Yoshino

14:00 – 14:15	**Vladimir Kozlov,** University of Linköping, Linköping, Sweden *Singularities of solutions of nonlinear elliptic equations*	*(p.211)*
14:15 – 14:30	**Sidi Mohammed Bouguima,** University of Tlemcen, Tlemcen, Algeria *Free boundary problem in the plane*	*(p.199)*
14:30 – 14:45	**Masafumi Yoshino,** Chuo University, Tokyo, Japan *Global solvability of fully nonlinear equations and Toeplitz operators*	*(p.225)*

Hyperbolic Equations IV (General Theory) — **H 111**
Chair: Pavel A. Krutitskii

15:00 – 15:15	**Ludmila S. Pulkina,** Samara State University, Samara, Russia *A nonlocal problem for the hyperbolic equation*	*(p.217)*
15:15 – 15:30	**Peetta Kandy Ratnakumar,** Indian Statistical Institute, Bangalore, India *Wave Equation for the Hermite Operator*	*(p.218)*
15:30 – 15:45	**Pavel A. Krutitskii,** Moscow State University, Moscow, Russia *Initial-boundary value problems in multiply connected domains for an equation of composite type*	*(p.212)*

Applied Problems II (Elasticity & Fusion) — **H 110**
Chair: Juan Francisco Padial

15:00 – 15:15	**Alexander A. Kosmodemyanskii,** MIIT Dept. of Comp. Math., Moscow, Russia *On the location of fail points in Torsion Problem*	*(p.211)*
15:15 – 15:30	**Juan Francisco Padial,** Universidad Politécnica de Madrid, Madrid, Spain *Some mathematical models related to nuclear fusion*	*(p.216)*

Poster Session — Tuesday, 25 August

14:00 – 15:45 — **MA 144**

Faina S. Berezovskaya, Center of Forest Ecology, Moscow, Russia
About solutions Ltraveling waves of Lienard equation cross-diffusion updatings *(p.198)*

Roland Duduchava, A. Razmadze Mathematical Institute, Tbilisi, Georgia
Asymptotics of solutions to crack–type and mixed problems *(p.202)*

Atsuhiko Eida, Tokyo Engineering University, Tokyo, Japan
Harmonic Analysis of Functions *(p.203)*

Kenji Hasegawa, Kongakuin University, Tokyo, Japan
Boundedness of Pseudodifferential Operators *(p.206)*

Toshio Horiuchi, Ibaraki University, Mito, Japan
Removable singularities for quasilinear degenerate elliptic equations with absorption terms *(p.206)*

Jaan Janno, Institute of Cybernetics, Tallinn, Estonia
Inverse problems for determining weakly singular kernels in partial integrodifferential equations *(p.207)*

Akisato Kubo, Fujita Health University, Toyoake, Aichi, Japan
Global existence of a classical solution to $\Box u - \mu u + au^m = 0$ *(p.212)*

Tokumori Nanbu, Toyama Medical and Pharmaceutical University, Toyama, Japan
On solutions of some nonlinear degenerate parabolic equations *(p.215)*

Dmitry Shepelsky, Seoul National University, Seoul, Korea
Inverse problem for a stratified uniaxial bianisotropic medium *(p.220)*