Section 15:
Numerical Analysis Scientific Computing

Invited Lectures

Monday, 24 August — H 1028

16:15 – 17:00 **Hisashi Okamoto,** RIMS, Kyoto University, Kyoto, Japan
Bifurcation of Kolmogorov flows with an emphasis on singular limit *(I: p.180)*
Chair: Rolf Jeltsch

17:15 – 18:00 **Gregory Beylkin,** University of Colorado at Boulder, Boulder, USA
On multiresolution methods in numerical analysis *(I: p.178)*
Chair: Siegfried Prößdorf

Tuesday, 25 August — H 1012

14:00 – 14:45 **Percy Alec Deift,** Courant Institute, New York University, New York, USA
Uniform asymptotics for orthogonal polynomials *(I: p.179)*
Chair: Tom H. Koornwinder

15:00 – 15:45 **Jan-Olov Strömberg,** Royal Institute of Technology, Stockholm, Sweden
Apriori estimates for approximation by wavelets in higher dimensions *(I: p.180)*
Chair: Peter Maaß

Wednesday, 26 August — H 1012

14:00 – 14:45 **Lloyd N. Trefethen,** Oxford University, Oxford, UK
Schwarz–Christoffel Mapping in the Computer Era *(I: p.181)*
Chair: Peter J. Deuflhard

15:00 – 15:45 **Bjorn Erik Engquist,** UCLA, Los Angeles, USA
Wavelet Based Numerical Homogenization *(I: p.179)*
Chair: Ralf Kornhuber

Short Communications and Poster Sessions

Short Communications — Wednesday, 19 August

Ordinary Differential Equations I — **H 2013**
Chair: Alexander Ostermann

14:00 – 14:15	**Gennady Yu. Kulikov,** Ulyanovsk State University, Ulyanovsk, Russia *How to control the global error of Runge-Kutta methods* *(p.305)*
14:15 – 14:30	**Alexander Ostermann,** Universität Innsbruck, Innsbruck, Austria *The unstable manifold of an equilibrium point under discretization* *(p.308)*
14:30 – 14:45	**George Micula,** Babes-Bolyai University, Cluj-Napoca, Romania *Polynomial spline functions of even degree approximating the solution of differential equations*

Ordinary Differential Equations II — **H 2013**
Chair: Tatiana Anatolyevna Vasilyeva

15:00 – 15:15	**Felix Schwitzer,** Universität Innsbruck, Innsbruck, Austria *Linearly implicit Runge-Kutta discretizations of semilinear parabolic problems near equilibria* *(p.312)*
15:15 – 15:30	**Sergei Yu. Pilyugin,** St.-Petersburg University, St.-Petersburg, Russia *Shadowing and perturbation of attractors in discretized parabolic equations* *(p.310)*
15:30 – 15:45	**Tatiana Anatolyevna Vasilyeva,** Volgograd State University, Volgograd, Russia *Twice implicit scheme with accuracy control and it application to chemical kinetics problems* *(p.316)*

Wavelets I (organized by Andreas Rathsfeld) — **H 2033**
Chair: Wayne M. Lawton

16:15 – 16:30	**Jacques Liandrat,** Univ Aix Marseille II, Marseille, France *Wavelets, from theory to efficients numerical algorithms* *(p.306)*
16:30 – 16:45	**Andreas Rieder,** Universität des Saarlandes, Saarbrücken, Germany *Embedding and a-priori adaptivity* *(p.311)*
16:45 – 17:00	**Pierre Gilles Lemarié-Rieusset,** Université d'Evry, Evry, France *Some remarks on divergence free vector wavelets* *(p.306)*

Nonlinear Operator Equations — **H 2013**
Chair: Jose A. Ezquerro

16:15 – 16:30	**Jose A. Ezquerro,** University of la Rioja, Logrono, Spain *A semilocal convergence result for Secant-type methods under Hölder continuity conditions* *(p.299)*
16:30 – 16:45	**Anatolii Borisovich Bakushinskii,** Inst. for System Analysis, Moscow, Russia *Iterative methods for the solution of nonlinear operator equations without property of the regularity* *(p.296)*
16:45 – 17:00	**Victor D. Didenko,** Odessa State University, Odessa, Ukraine *On Peculiarities of Approximation Methods for Singular Integral Equations with Conjugation* *(p.298)*

Interpolation — **H 2033**
Chair: Raquel R. Martinez

17:15 – 17:30	**Raquel R. Martinez,** Universidad Politécnica de Madrid, Madrid, Spain *Composite Methods for Interpolating Functions* *(p.307)*
17:30 – 17:45	**Wolfgang Volk,** Berlin, Germany *Quasi-interpolation with Arbitrarily Often Differentiable Functions* *(p.316)*
17:45 – 18:00	**Yurij Kaluch I.,** Ukrainian Academy Of Public Administration, Kiev, Ukraine *Mathematical Problems of Condition Prognosing of Land Slopes and Slides* *(p.303)*

Short Communications — Thursday, 20 August

Approximation I — H 2033
Chair: Jozsef Grof

14:00 – 14:15	**Alexis Bacopoulos,** National Technical University, New Psychico, Athens, Greece *On the link among vectorial minimal projections and best approximations* (p.296)
14:15 – 14:30	**Igor Fedotov,** University of Transkei, Umtata, South Africa *Another Approach to Quadrature Methods* (p.300)
14:30 – 14:45	**Jozsef Grof,** Universität Veszprem, Veszprem, Hungary *Einige Verallgemeinerungen bzw. Modifizierungen der Szász-Mirakjan-Operatoren* (p.301)

Partial Differential Equations I — H 2013
Chair: Vladimir V. Shaidurov

14:00 – 14:15	**Christoph Pflaum,** Institut für Angewandte Mathematik und Statistik, Würzburg, Germany *Robust Multilevel Algorithms for Elliptic Differential Equations* (p.309)
14:15 – 14:30	**Vladimir V. Shaidurov,** Russian Academy of Sciences, Krasnoyarsk, Russia *Cascade finite element methods for weakly nonlinear elliptic equations* (p.313)
14:30 – 14:45	**Urve Kangro,** Tartu University, Tartu, Estonia *Spectral Convergence of the Interior Source Method with Point Matching* (p.303)

Approximation II — H 2033
Chair: Alexei A. Mailybaev

15:00 – 15:15	**Alois Heinz,** Universität Freiburg, Freiburg, Germany *Efficient function approximation by tree-structured neural networks* (p.302)
15:15 – 15:30	**Peter Kirrinnis,** Universität Bonn, Bonn, Germany *Fast algorithms for partial fractions* (p.305)
15:30 – 15:45	**Alexei A. Mailybaev,** Lomonosov Moscow State University, Moscow, Russia *Transformation of Families of Matrices to Normal Forms* (p.306)

Partial Differential Equations II — H 2013
Chair: Jürgen Fuhrmann

15:00 – 15:15	**Bodo Erdmann,** Konrad-Zuse-Zentrum, Berlin, Germany *Mesh Controlling Strategy for Solving Nonlinear Evolution Problems* (p.299)
15:15 – 15:30	**Christian Wieners,** University Stuttgart, Stuttgart, Germany *Adaptive multigrid methods for Prandtl-Reuß-plasticity* (p.318)
15:30 – 15:45	**Jürgen Fuhrmann,** Weierstraß Institut, Berlin, Germany *Numerically Stable Finite Volume Discretizations for Nonlinear Parabolic Problems* (p.300)

Wavelets II (organized by Andreas Rathsfeld) — H 2013
Chair: Jacques Liandrat

16:15 – 16:30	**Rudolph A. Lorentz,** GMD, St. Augustin, Germany *On the nonexistence of compactly supported Sobolev prewavelets for box spline multiresolution analyses* (p.306)
16:30 – 16:45	**Gunther Schmidt,** WIAS, Berlin, Germany *Representation of multidimensional potentials by approximate wavelets* (p.312)
16:45 – 17:00	**Wayne M. Lawton,** National University, Singapore, Singapore *Energy functions on graphs, wavelets, and multilevel algorithms* (p.305)

Differential Algebraic Systems — H 2013
Chair: Ulrich Nowak

17:15 – 17:30	**Rainald Ehrig,** Konrad-Zuse-Zentrum für Informationstechnik, Berlin, Germany *Recent advances in extrapolation methods for large scale differential algebraic problems* (p.299)
17:30 – 17:45	**Friedrich Grund,** Weierstraß Institut, Berlin, Germany *Sparse-Matrix-Techniken für Parallelrechner* (p.301)
17:45 – 18:00	**Tatyana Shtykel,** Humboldt–Universität, Berlin, Germany *On the criterion of asymptotical stability for index-1 tractable DAE* (p.313)

Short Communications — Friday, 21 August

Wavelets III (organized by Andreas Rathsfeld) — **H 2033**
Chair: Pierre Gilles Lemarié-Rieusset

16:15 – 16:30	**Siegfried Prößdorf,** Weierstraß Institut, Berlin, Germany *Boundary element methods using multiwavelets*	*(p.310)*
16:30 – 16:45	**Jörg Schult,** Weierstraß Institut, Berlin, Germany *Stability condition for spline and multiwavelet collocation*	*(p.312)*
16:45 – 17:00	**Marie Farge,** École Normale Supérieure, Paris, France *How to compute and model two-dimensional turbulent flows using wavelets?*	

Partial Differential Equations III — **H 2033**
Chair: Jianping Zhu

17:15 – 17:30	**P. Sobolevskii,** The Hebrew University of Jerusalem, Jerusalem, Israel *The "counter-example" to W. Littman's counter-example of L_p-energetical inequality for wave equation*	*(p.314)*
17:30 – 17:45	**Ilja Schmelzer,** WIAS, Berlin, Germany *Grid Generation with Contravariant Geometry Description*	*(p.311)*

Short Communications — Saturday, 22 August

Partial Differential Equations IV — **H 2033**
Chair: Jennifer J. Zhao

14:00 – 14:15	**Jennifer J. Zhao,** University of Michigan, Dearborn, Michigan, USA *Finite-difference approximations to a parabolic system modeling the thermoelastic contacts of two rods*	*(p.319)*
14:15 – 14:30	**Jianping Zhu,** Mississippi State University, Mississippi, MS, USA *A High Order Algorithm for Solving Reaction Diffusion Equations*	*(p.319)*
14:30 – 14:45	**Raul Kangro,** Tartu University, Tartu, Estonia *Analysis of Artificial Boundary Conditions for Black-Scholes Equations*	*(p.304)*

Partial Differential Equations V — **H 2033**
Chair: Cesar Palencia

15:00 – 15:15	**Cesareo González,** Universidad de Valladolid, Valladolid, Spain *The implicit Euler method for abstract time-dependent parabolic problems with variable domains*	*(p.301)*
15:15 – 15:30	**Raimondas Ciegis,** Institute of Mathematics and Informatics, Vilnius, Lithuania *Odd — even difference schemes for the Schrödinger problem*	*(p.298)*
15:30 – 15:45	**Daisuke Furihata,** RIMS, Kyoto University, Kyoto, Japan *Finite difference schemes that inherit the energy conservation or dissipation property from partial differential equations*	*(p.300)*

Short Communications — Monday, 24 August

Inverse Problems I — **H 2033**
Chair: Anatoly G. Yagola

14:00 – 14:15	**Gottfried Bruckner,** WIAS, Berlin, Germany *On the regularization of an inverse vibration problem with noisy data*	*(p.297)*
14:15 – 14:30	**Cesar Palencia,** Universidad de Valladolid, Valladolid, Spain *A numerical method for the integration of backward parabolic problems*	*(p.308)*
14:30 – 14:45	**Sergii Pereverziev,** Institute of Mathematics, Kiev, Ukraine *An adaptive discretization of third kind Volterra equations with weakly singular kernels*	*(p.309)*

Inverse Problems II Chair: Sergii Pereverziev		**H 2033**
15:00 – 15:15	**Sergiy Georgievich Solodkyy,** Ukrainian Acad. of Sci., Kiev, Ukraine *Optimization of projection methods for solving linear ill-posed problems*	*(p.314)*
15:15 – 15:30	**Anatoly G. Yagola,** Moscow State University, Moscow, Russia *Ill-posed problems and a priori information*	*(p.318)*
15:30 – 15:45	**Weichung Wang,** National Tainan Teachers College, Tainan, Taiwan *Using Preconditioned Conjugate Gradients in Final Iterations of Interior Point Methods*	*(p.317)*

Short Communications — Tuesday, 25 August

Partial Differential Equations VI Chair: Ivanka P. Nikolova		**H 2033**
16:15 – 16:30	**Ivanka P. Nikolova,** University of Pittsburgh, Pittsburgh, PA, USA *Modeling of Fluid Flows with Strong Non-Linearity*	*(p.307)*
16:30 – 16:45	**Christian von Törne,** Universität Bonn, Bonn, Germany *Method of Transport — A Multidimensional Scheme for Nonlinear Hyperbolic Systems*	*(p.317)*
16:45 – 17:00	**Nicolai von Schroeders,** UGH Paderborn, Paderborn, Germany *Die numerische Lösung der schwachen Formulierung des Stokes-Systems im Außenraumgebiet*	*(p.317)*

Partial Differential Equations VII Chair: Ursula van Rienen		**H 2033**
17:15 – 17:30	**Maxim A. Olshanskii,** Moscow State University, Moscow, Russia *Iterative method for generalized Stokes problem*	*(p.308)*
17:30 – 17:45	**Chi-Wang Shu,** Brown University, Providence,RI, USA *High Order Weighted ENO Schemes for Unstructured Meshes*	*(p.314)*
17:45 – 18:00	**Ursula van Rienen,** Universität Rostock, Rostock, Germany *Efficient Algorithms in Electromagnetic Field Computation*	*(p.316)*

Short Communications — Wednesday, 26 August

Wavelets IV (organized by Andreas Rathsfeld) Chair: Andreas Rathsfeld		**H 2033**
16:15 – 16:30	**Jürgen Prestin,** GSF-Nat. Res. Center for Environment and Health, Neuherberg, Germany *Polynomial wavelets*	
16:30 – 16:45	**Andreas Rathsfeld,** WIAS, Berlin, Germany *Piecewise linear wavelet collocation for boundary element methods*	*(p.310)*

Poster Session — Saturday, 22 August

16:15 – 18:00 **MA 144**

Mansour Abdullah Al-Zanaidi, Kuwait University, Kuwait, Kuwait
A Class of Generalized Trapezoidal Formulas for the Integration of y'=f(x, y) *(p.296)*

Mehmet Bozer, Eastern Mediterranean University, Famagusta, North Cyprus, Cyprus
The composite grids method of increased accuracy in solving the mixed boundary value problem for the Laplace equation *(p.297)*

Chin-Yun Chen, Universität Karlsruhe, Karlsruhe, Germany
VANI: A package for Validated, Adaptive Numerical Integration in one and more dimensions *(p.297)*

Adigezal Dosiyev, Eastern Mediterranean University, Famagusta, North Cyprus, Cyprus
A block-grid method for solving Laplace's boundary value problem with singularities *(p.298)*

Bratislav Iricanin, University of Belgrade, New Belgrade, Yugoslavia
On the modification of Euler-Maclaurin summation formula connected with the Chebyshev quadrature formulae *(p.302)*