CURRICULUM VITAE

ALEXANDER KURGANOV

AFFILIATION
Department of Mathematics, Tulane University, New Orleans, LA 70118
Phone: (504)862-3443, Fax: (504)865-5063
E-mail: kurganov@math.tulane.edu
URL: http://www.math.tulane.edu/∼kurganov/

PERSONAL DATA

Date & place of birth:	February 18, 1969, Odessa, U.S.S.R.
Citizenship:	Israeli; US permanent resident
Languages:	Russian (native), English, Hebrew

ACADEMIC EDUCATION

1991 – 1997 Ph.D. in mathematics
School of Mathematical Sciences, Tel-Aviv University, Israel
Thesis: *Conservation Laws: Stability of Numerical Approximations and Nonlinear Regularization*
Advisor: *Professor E. Tadmor*

1984 – 1989 M.Sc (Diploma of Higher Education) in mathematics
Mechanical-Mathematical Faculty, Moscow State University, U.S.S.R.
Thesis: *Numerical Solution of Problems of Self-focusing*
Advisors: *Professor N. Bakhvalov, Senior Researcher M. Vladimirov*

ACADEMIC EXPERIENCE

2004 – present Associate Professor, Mathematics Department, Tulane University
Courses: `Calculus, ODEs, PDEs, Numerical Analysis`

2005, fall Visiting Associate Professor, Department of Mathematics, University of Michigan
Courses: `Numerical Methods for Hyperbolic Conservation Laws`

2001 – 2004 Assistant Professor, Mathematics Department, Tulane University
Courses: `Calculus, ODEs, Introduction to Numerical Analysis, Numerical Methods for Geophysical Fluid Dynamics, Numerical Methods for Hyperbolic Conservation Laws`

1998 – 2001 Assistant Professor, Department of Mathematics, University of Michigan
Courses: `Applied Honors Calculus, Numerical Linear Algebra, Introduction to Numerical Methods`

1998, spring Postdoctoral Fellow, Institute of Applied & Computational Mathematics
Foundation for Research and Technology, Heraklion, Greece

1997, fall Postdoctoral Fellow, Mittag-Leffler Institute, The Royal Academy of Sciences, Djursholm, Sweden

1994 – 1997 Instructor, School of Mathematical Sciences, Tel-Aviv University, Israel
Courses: `Calculus, Complex Analysis, ODEs, PDEs`

1996 – 1997 Tutor, Department of Mathematics, Open University, Israel
Course: `Calculus`

1992 – 1994 Teaching Assistant, School of Mathematical Sciences
Tel-Aviv University, Israel
Courses: `Calculus, Complex Analysis, ODEs, PDEs`

1989 – 1991 Assistant Lecturer, Department of Applied and Computational Mathematics, Odessa Civil Engineering Institute, Odessa, U.S.S.R.
Courses: `PDEs, Numerical Methods, Programming, Probability and Mathematical Statistics`

INVITED TALKS

2006 Banff International Research Station for Mathematical Innovation and Discovery, Workshop on Numerical Methods for Degenerate Elliptic Equations and Applications, Banff, AB, Canada

Banff International Research Station for Mathematical Innovation and Discovery, Workshop on Nonlinear Diffusions: Entropies, Asymptotic Behavior and Applications, Banff, AB, Canada

2005 Foundations of Computational Mathematics conference, Workshop on Foundations of Numerical PDEs, Universidad de Cantabria, Santander, Spain

The International Symposium on Finite Volumes for Complex Applications IV: Problems and Perspectives, Marrakesh, Morocco

International Conference on Scientific Computing, Nanjing, China

American Institute of Mathematics (AIM) Research Conference Center Workshop on Stiff Sources and Numerical Methods for Conservation Laws, Palo Alto, CA

2004 Tenth International Conference on Hyperbolic Problems: Theory, Numerics and Applications, Osaka, Japan

Meeting at Mathematisches Forschungsinstitut Oberwolfach on Hyperbolic Conservation Laws, Oberwolfach, Germany

2003 Geometrically Based Motions the Second Reunion Conference Institute for Pure & Applied Mathematics (IPAM), UCLA

2002 Geometrically Based Motions Reunion Conference, IPAM, UCLA
National Center for Theoretical Sciences, Hsinchu, Taiwan

2001 Culminating Workshop at Lake Arrowhead; Geometrically Based Motions Program IPAM, UCLA
Meeting on Image Processing, Computer Vision, Computer Graphics, Adaptive and Fast Algorithms; Geometrically Based Motions Program, IPAM, UCLA

2000 Meeting at Mathematisches Forschungsinstitut Oberwolfach on Hyperbolic Conservation Laws, Oberwolfach, Germany
TMR Workshop on Numerical Methods for Hyperbolic Conservation Laws Valencia, Spain

1999 Mini-course: `Central Schemes for Hyperbolic Conservation Laws and Related Problems`, University of Freiburg, Germany
Meeting at Mathematisches Forschungsinstitut Oberwolfach on Hyperbolic Aspects of Fluid Dynamics, Oberwolfach, Germany

COLLOQUIUM TALKS

2008 University of New Orleans, Department of Mathematics

2007 Iowa State University, Department of Mathematics
Tsinghua University, Beijing, China, Department of Mathematics

2005 Hong Kong Baptist University, Hong Kong, Department of Mathematics

2002 University of New Orleans, Department of Mathematics

2001 Michigan Technological University, Department of Mathematical Sciences

SELECTED SEMINAR TALKS

2008 North Carolina State University, Department of Mathematics
Paul Sabatier University, Institute of Mathematics, Toulouse, France

2007 University of California at Merced, School of Natural Sciences
North Carolina State University, Department of Mathematics

2006 Texas A&M University, Department of Mathematics
University of Wisconsin at Madison, Department of Mathematics

2005 Keldysh Institute of Applied Mathematics of the Russian Academy of Science, Moscow, Russia
University of Michigan, Department of Mathematics

East China Normal University, China, Department of Mathematics
Hong Kong University of Science and Technology, Hong Kong
Department of Mathematics
Brown University, Division of Applied Mathematics
North Carolina State University, Department of Mathematics

2004 University of Washington, Department of Atmospheric Sciences

2003 University of Tokyo, Japan, Department of Aeronautics and Astronautics
Aerospace Propulsion
Tel-Aviv University, Israel, School of Mathematical Sciences
University of Maryland, Department of Mathematics

2002 North Carolina State University, Department of Mathematics
Center for Computational Science, Tulane University
Academia Sinica, Taipei, Taiwan, Institute of Mathematics
National Taiwan University, Taipei, Taiwan, Department of Mathematics
University of Provence, Marseilles, France, Center for Mathematics and Informatics
Würzburg University, Germany, Institute of Applied Mathematics
Pacific Institute for the Mathematical Sciences, Centre for Scientific
Computing Seminar, Simon Fraser University, Canada
University of Washington, Department of Applied Mathematics
University of Houston, Department of Mathematics

2001 Texas A&M University, Department of Mathematics
Los Alamos National Laboratory
North Carolina State University, Department of Mathematics
University of Technology in Aachen, Germany, Division of Mathematics
University of Geneva, Switzerland, Department of Mathematics
Tulane University, Department of Mathematics

2000 University of Michigan, Department of Mathematics
Tel-Aviv University, Israel, School of Mathematical Sciences

1999 University of California at Santa Barbara, Department of Mathematics
University of California at Irvine, Department of Mathematics
University of California at Los Angeles, Department of Mathematics
University of Wisconsin at Madison, Department of Mathematics
Bonn University, Germany, Institute of Applied Mathematics
Tel-Aviv University, Israel, School of Mathematical Sciences
University of Michigan, Department of Mathematics
University of Houston, Department of Mathematics
University of California at Berkeley, Lawrence Berkeley National Laboratory

1998 University of Michigan, Department of Mathematics

1997 Mittag-Leffler Institute, Sweden, Program on Computational Methods for Differential Equations

AWARDS

2006 – 2009 NSF Research Grant, PI, Tulane University

2003 – 2006 NSF Research Grant, PI, Tulane University

2000 – 2003 NSF Research Grant, PI, University of Michigan/Tulane University

1998 – 2001 Supported in part by a Group Infrastructure Grant, University of Michigan

1999 Rackham Graduate School Faculty Fellowship for Research University of Michigan

1997 The Rosset Prize (for excellence in mathematics), School of Mathematical Sciences, Tel-Aviv University, Israel

GRADUATE STUDENT SUPERVISED

2007 – present Jeremy Dewar, Tulane University

UNDERGRADUATE STUDENT SUPERVISED

2007 – present Maren Leopold, Tulane University
2006 – 2007 Anthony Polizzi, Tulane University (senior thesis, 2007)

OTHER SERVICES

2007 – present Associate editor of The Open Applied Mathematics Journal

2007 Co-organizer of the mini-symposium *Numerical Methods for Multicomponent Flows* at the Sixth International Congress on Industrial and Applied Mathematics, Zürich, Switzerland
Organizer of the Clifford Lectures and Clifford Lectures Conference 2007 Tulane University

2006 – present Associate editor of the Mathematical Modelling and Applied Computing
Associate editor of the International Journal of Computing Science and Mathematics

2004 – present Associate editor of the SIAM Journal on Scientific Computing

2005 Co-organizer of the mini-symposium *Numerical Methods for Multicomponent Flows* at the Second International Conference on Scientific Computing and Partial Differential Equations & The First East Asia SIAM Symposium,

Hong Kong Baptist University, Hong Kong
Co-organizer of the two mini-symposia: *Computational Aspects of Transport Phenomena* and *Numerical Methods for Geophysical Flows*
at the 2005 SIAM Annual Meeting, New Orleans, LA
Served on the National Science Foundation Panel

2000 Co-organizer of the Michigan Interdisciplinary Mathematics Meeting III
University of Michigan

LIST OF PUBLICATIONS

[1] A. Kurganov and P. Rosenau,

The Effect of a Saturating Dissipation in Burgers-type Equations,

Communications on Pure and Applied Mathematics, 50 (1997), pp. 753–771.

[2] A. Kurganov and E. Tadmor,

Stiff Systems of Hyperbolic Conservation Laws. Convergence and Error Estimates,

SIAM Journal on Mathematical Analysis, 28 (1997), pp. 1446–1456.

[3] A. Kurganov, D. Levy and P. Rosenau,

On Burgers-type Equations with Non-monotonic Dissipative Fluxes,

Communications on Pure and Applied Mathematics, 51 (1998), pp. 443–473.

[4] J. Goodman, A. Kurganov and P. Rosenau,

Breakdown of Burgers-type Equations with Saturating Dissipation Fluxes,

Nonlinearity, 12 (1999), pp. 247–268.

[5] A. Kurganov and E. Tadmor,

New High Resolution Central Schemes for Nonlinear Conservation Laws and Convection-Diffusion Equations,

Journal of Computational Physics, 160 (2000), pp. 241–282.

[6] A. Kurganov and E. Tadmor,

New High-Resolution Semi-Discrete Central Schemes for Hamilton-Jacobi Equations,

Journal of Computational Physics, 160 (2000), pp. 720–742.

[7] A. Kurganov and G. Petrova,

Central Schemes and Contact Discontinuities,

Mathematical Modelling and Numerical Analysis, 34 (2000), pp. 1259–1275.

[8] A. Kurganov and D. Levy,

A Third-Order Semi-Discrete Central Scheme for Conservation Laws and Convection-Diffusion Equations,

SIAM Journal on Scientific Computing, 22 (2000), pp. 1461–1488.

[9] A. Kurganov and G. Petrova,

A Third-Order Semi-Discrete Genuinely Multidimensional Central Scheme for Hyperbolic Conservation Laws and Related Problems,

Numerische Mathematik, 88 (2001), pp. 683–729.

[10] A. Kurganov, S. Noelle and G. Petrova,

Semi-Discrete Central-Upwind Schemes for Hyperbolic Conservation Laws and Hamilton-Jacobi Equations,

SIAM Journal on Scientific Computing, 23 (2001), pp. 707–740.

[11] S. Karni, A. Kurganov and G. Petrova,

A Smoothness Indicator for Adaptive Algorithms for Hyperbolic Systems,

Journal of Computational Physics, 178 (2002), pp. 323–341.

[12] A. Kurganov and E. Tadmor,

Solution of Two-Dimensional Riemann Problems for Gas Dynamics without Riemann Problem Solvers,

Numerical Methods for Partial Differential Equations, 18 (2002), pp. 584–608.

[13] A. Kurganov and D. Levy,

Central-Upwind Schemes for the Saint-Venant System,

Mathematical Modelling and Numerical Analysis, 36 (2002), pp. 397–425.

[14] A. Kurganov,

Central-Upwind Schemes for Balance Laws. Application to the Broadwell Model,

Finite Volumes for Complex Applications, III (Porquerolles, 2002), pp. 351–358, Hermes Sci. Publ., Paris, 2002.

[15] A. Chertock, A. Kurganov and P. Rosenau,

Formation of Discontinuities in Flux-Saturated Degenerate Parabolic Equations,

Nonlinearity, 16 (2003), pp. 1875–1898.

[16] A. Kurganov,

An Accurate Deterministic Projection Method for Hyperbolic Systems with Stiff Source Term,

Hyperbolic Problems: Theory, Numerics, Applications (Pasadena, 2002), pp. 665–674, Springer-Verlag, 2003.

[17] J. Otero, L.A. Dontcheva, H. Johnston, R.A. Worthing, A. Kurganov, G. Petrova and C.R. Doering,

High Raleigh Number Convection in a Fluid Saturated Porous Layer,

Journal of Fluid Mechanics, 500 (2004), pp. 263–281.

[18] S. Karni, E. Kirr, A. Kurganov and G. Petrova,

Compressible Two-Phase Flows by Central and Upwind Schemes,

Mathematical Modelling and Numerical Analysis, 38 (2004), pp. 477–494.

[19] A. Chertock and A. Kurganov,

On a Hybrid Finite-Volume-Particle Method,

Mathematical Modelling and Numerical Analysis, 38 (2004), pp. 1071–1091.

[20] S. Karni and A. Kurganov,

Local Error Analysis for Approximate Solutions of Hyperbolic Conservation Laws,

Advances in Computational Mathematics, 22 (2005), pp. 79–99.

[21] S. Bryson, A. Kurganov, D. Levy and G. Petrova,

Semi-Discrete Central-Upwind Schemes with Reduced Dissipation for Hamilton-Jacobi Equations,

IMA Journal of Numerical Analysis, 25 (2005), pp. 113–138.

[22] A. Chertock, A. Kurganov and P. Rosenau,

On Degenerate Saturated-Diffusion Equations with Convection,

Nonlinearity, 18 (2005), pp. 609–630.

[23] A. Kurganov and G. Petrova,

Central-Upwind Schemes on Triangular Grids for Hyperbolic Systems of Conservation Laws,

Numerical Methods for Partial Differential Equations, 21 (2005), pp. 536–552.

[24] A. Chertock, A. Kurganov and G. Petrova,

Fast Explicit Operator Splitting Method. Application to the Polymer System,

Finite Volumes for Complex Applications, IV (Marrakech, 2005), pp. 63–72, Hermes Sci. Publ., 2005.

[25] A. Chertock and A. Kurganov,

Conservative Locally Moving Mesh Method for Multifluid Flows,

Finite Volumes for Complex Applications, IV (Marrakech, 2005), pp. 273–284, Hermes Sci. Publ., 2005.

[26] A. Kurganov and P. Rosenau,

On Reaction Processes with Saturating Diffusion,

Nonlinearity, 19 (2006), pp. 171–193.

[27] A. Chertock, A. Kurganov and G. Petrova,

Finite-Volume-Particle Methods for Models of Transport of Pollutant in Shallow Water,

Journal of Scientific Computing, 27 (2006), pp. 189–199.

[28] A. Kurganov and G. Petrova,

Adaptive Central-Upwind Schemes for Hamilton-Jacobi Equations with Nonconvex Hamiltonians,

Journal of Scientific Computing, 27 (2006), pp. 323–333.

[29] A. Chertock and A. Kurganov,

On a Practical Implementation of Particle Methods,

Applied Numerical Mathematics, 56 (2006), pp. 1418–1431.

[30] A. Kurganov,

Well-Balanced Central-Upwind Scheme for Compressible Two-Phase Flows,

Proceedings of the European Conference on Computational Fluid Dynamics ECCOMAS CFD 2006.

[31] A. Kurganov and C.-T. Lin,

On the Reduction of Numerical Dissipation in Central-Upwind Schemes,

Communications in Computational Physics., 2 (2007), pp. 141–163.

[32] A. Kurganov and G. Petrova,

A Second-Order Well-Balanced Positivity Preserving Central-Upwind Scheme for the Saint-Venant System,

Communications in Mathematical Sciences, 5 (2007), pp. 133–160.

[33] A. Kurganov, G. Petrova and B. Popov,

Adaptive Semi-Discrete Central-Upwind Schemes for Nonconvex Hyperbolic Conservation Laws,

SIAM Journal on Scientific Computing, 29 (2007), pp. 2381–2401.

[34] A. Chertock, A. Kurganov and Yu. G. Rykov,

A New Sticky Particle Method for Pressureless Gas Dynamics,

SIAM Journal on Numerical Analysis, 45 (2007), pp. 2408–2441.

[35] A. Chertock, E. Kashdan and A. Kurganov,

Propagation of Diffusing Pollutant by a Hybrid Eulerian-Lagrangian Method,

Hyperbolic Problems: Theory, Numerics, Applications (Lyon 2006), pp. 371–380, Springer, 2008.

[36] A. Kurganov and G. Petrova,

A Central-Upwind Scheme for Nonlinear Water Waves Generated by Submarine Landslides,

Hyperbolic Problems: Theory, Numerics, Applications (Lyon 2006), pp. 635–642, Springer, 2008.

[37] L.A. Constantin and A. Kurganov,

Adaptive Central-Upwind Schemes for Hyperbolic Systems of Conservation Laws,

to appear in Hyperbolic Problems: Theory, Numerics, Applications (Osaka, 2004).

[38] A. Chertock, A. Kurganov and G. Petrova,

Fast Explicit Operator Splitting Method for Convection-Diffusion Equations,

International Journal for Numerical Methods in Fluids, to appear.

[39] A. Chertock and A. Kurganov,

Computing Multivalued Solutions of Pressureless Gas Dynamics by Deterministic Particle Methods,

Communications in Computational Physics, to appear.

[40] A. Kurganov and J. Rauch,

The Order of Accuracy of Quadrature Formulae for Periodic Functions,

submitted.

[41] I. Kliakhandler and A. Kurganov,

Quasi-Lagrangian Acceleration of Eulerian Methods,

submitted to Journal of Computational Physics.

[42] A. Chertock, S. Karni and A. Kurganov,

Interface Tracking Method for Compressible Multifluids,

submitted to Mathematical Modelling and Numerical Analysis.

[43] A. Chertock and A. Kurganov,

A Positivity Preserving Central-Upwind Scheme for Chemotaxis and Haptotaxis Models,

submitted to Numerische Mathematik.

[44] A. Kurganov and A. Polizzi,

Non-Oscillatory Central Schemes for a Traffic Flow Model with Arrhenius Look-Ahead Dynamics,

submitted to Networks and Heterogeneous Media.

[45] A. Chertock and A. Kurganov,

A Simple Eulerian Finite-Volume Method for Compressible Fluids in Domains with Moving Boundaries,

submitted to Communications in Mathematical Sciences.

[46] Y. Epshteyn and A. Kurganov,

New Interior Penalty Discontinuous Galerkin Methods for the Keller-Segel Chemotaxis Model,

submitted to SIAM Journal on Numerical Analysis.

[47] A. Chertock and A. Kurganov,

On Splitting-Based Numerical Methods for Convection-Diffusion Equations,

submitted to Quaderni di Matematica.

[48] A. Kurganov and G. Petrova,

Central-Upwind Schemes for Two-Layer Shallow Water Equations,

submitted to SIAM Journal on Scientific Computing.

[49] A. Chertock, C.R. Doering, E. Kashdan, and A. Kurganov,

A Fast Explicit Operator Splitting Method for Passive Scalar Advection,

submitted to Mathematical Modelling and Numerical Analysis.

UNREFEREED PUBLICATIONS

[1] A. Kurganov, G. Petrova and B. Popov,

Central-Upwind Schemes for Hyperbolic Conservation Laws,

Proceedings of "Iterative Methods, Preconditioning and Numerical PDEs", 2004, pp. 105–108.

[2] A. Kurganov and S. Tsynkov,

On Spectral Accuracy of Quadrature Formulae Based on Piecewise Polynomial Interpolations,

Center for Research in Scientific Computation, North Carolina State University, Technical Report No. CRSC-TR07-11, 2007; available at
`http://www.ncsu.edu/crsc/reports/ftp/pdf/crsc-tr07-11.pdf`

OTHER PUBLICATIONS

[1] A. Kurganov, R. Lazarov, D. Levy, G. Petrova and B. Popov,

Eitan Tadmor – 50,

Computational Methods in Applied Mathematics, 4 (2004), pp. 265–270.