

# Doron Levy

## Curriculum Vitae

### Affiliation

Department of Mathematics  
University of Maryland  
College Park, MD 20742-4015

Phone: (301) 405-5140  
Fax: (301) 314-0827

and

CSCAMM  
University of Maryland  
4146 CSIC Building #406  
Paint Branch Drive  
College Park, MD 20742-3289

Phone: (301) 405-1330  
Fax: (301) 314-6674

E-mail: [dlevy@math.umd.edu](mailto:dlevy@math.umd.edu)  
URL: <http://www.math.umd.edu/~dlevy>

### Education

- 1997 **Ph.D., Applied Mathematics**, Tel-Aviv University, Israel  
“Topics in Approximate Methods for Non-Linear Partial Differential Equations”  
Advisor: Prof. Eitan Tadmor
- 1994 **M.Sc.** (summa cum laude), **Applied Mathematics**, Tel-Aviv University, Israel  
“From Semi-Discrete to Fully-Discrete: The Stability of Runge-Kutta Schemes  
by the Energy Method”. Advisor: Prof. Eitan Tadmor
- 1991 **B.Sc.** (cum laude), **Multidisciplinary Program in Mathematics and Physics**,  
School of Physics and Astronomy, Tel-Aviv University, Israel

### Research Interests

- Biology and Medical Applications
- Cancer Dynamics, Immunology, Cell Motility
- Applied Nonlinear PDEs
- Numerical Analysis.

### Academic Experience

- 2007 – present **Associate Professor**, Dept. of Mathematics, **University of Maryland**
- 2007 – present **Associate Professor**, Center for Scientific Computation and Mathematical  
Modeling, **University of Maryland**
- 2000 – 2007 **Assistant Professor**, Dept. of Mathematics, **Stanford University**
- 9/05, 6/06 **Visiting Professor**, **Ecole Normale Superieure, Paris**
- 1998 – 2000 **Visiting Asst. Professor**, Dept. of Mathematics, **UC Berkeley**
- 1998 – 2000 **Post-Doctoral Fellow**, Dept. of Mathematics, **Berkeley National Lab**

- 1997 – 1998 **Post-Doctoral Fellow**, Dept. de Mathematiques et d'Informatique,  
**Ecole Normale Superieure, Paris**
- 1997 –1998 **Post-Doctoral Fellow**, Laboratoire d'Analyse Numerique,  
Universite Pierre et Marie Curie, **Paris 6**
- 1996 Fall **Visiting Scholar**, Dept. of Mathematics, **UCLA**

## Awards

- 2009 **Departmental Award for Excellence and Innovation  
in Undergraduate Teaching**  
Center for Teaching Excellence, University of Maryland
- 2002 **National Science Foundation (NSF) Career Award**
- 1998 **Haim Nessayahu Prize** for Best Ph.D. Thesis in Mathematics in Israel,  
Israeli Union of Mathematics.  
See <http://imu.org.il/Nessayahu/index.html>
- 1996 **Nemirovsky Doctoral Fellowship** in Mathematics and Computer Science
- 1996 **Ami Harten Award** for Excellence in Applied Math Graduate Studies  
School of Mathematical Sciences, Tel-Aviv University
- 1990, 94 **Excellence in Teaching Award**  
School of Mathematical Sciences, Tel-Aviv University
- 1992 **M.Sc. Excellence award**  
School of Mathematical Sciences, Tel-Aviv University
- 88–90, 92–93 **Dean's list**  
Faculty of Exact Sciences, Tel-Aviv University

## Grants

- 9/08 – 8/12 **NSF/NIGMS**, DMS-0758374, \$1.1M.  
PI with Devaki Bhaya (Carnegie Institution)  
"Social dynamics, signaling, and surface motility in Cyanobacteria"
- 1/08 – 12/12 **NIH**, R01CA130817-01, \$2M.  
Co-PI With Peter Lee (Hematology, Stanford)  
"Interplay between cancer and immune cells on targeted therapy"
- 2006 – 09 **NIH**, CA104205-01A2, \$1M.  
With Lei Xing (PI, Radiation Oncology, Stanford)  
"Intensity Modulated Radiation Therapy (IMRT) dose optimization"
- 2006 – 11 **DOD BC051650**, \$4M.  
With Peter Lee (PI, Hematology) and Susan Holmes (Statistics, Stanford)  
"Immunobiology, systems biology, and immunotherapy of breast cancer"
- 2002 – 07 **NSF Career Award** DMS-0133511, \$400K.  
"Partial differential equation-based image processing with applications to  
radiation oncology"

## Professional Activities

### 1. Editorial Board:

- i. SIAM Journal on Numerical Analysis (SINUM)
- ii. Discrete and Continuous Dynamics Systems Series B (DCDS-B)
- iii. Differential Equations and Dynamical Systems (DEDS)
- iv. Advances in Numerical Analysis
- v. Mathematics Applied in Science and Technology (MAST)
- vi. Le Matematiche
- vii. Acta Applicandae Mathematicae

## 2. Referee:

- State Department, Department of Energy, National Science Foundation, National Sciences and Engineering Research Council of Canada, Israeli Science Foundation, Agence Nationale de la Recherche (France)
- Archive for Rational Mechanics, Journal of Theoretical Biology, SIAM Journal on Numerical Analysis, SIAM Journal on Scientific Computing, Journal of Computational Physics, Information Sciences, IMA Journal on Numerical Analysis, Journal of Scientific Computing, Applied Mathematics and Computation, Computers and Fluids, Physics of Fluids, International Journal for Numerical Methods in Engineering, International Journal of Computational Methods, Journal of Computational and Applied Mathematics, Numerical Methods for Partial Differential Equations, Arab Journal of Mathematical Sciences, Applied Numerical Mathematics, Mathematics and Computers in Simulation, Communications in Mathematical Sciences, Journal of Statistical Theory and Practice, Journal of Statistical Physics, Inverse Problems and Imaging, Nonlinearity, Continuum Mechanics and Thermodynamics.
- Mathematical Reviews

## 3. University Service:

### (a) University of Maryland

- A member of the **Burgers Program for Fluid Dynamics**, University of Maryland
- A member of the **Applied Mathematics and Scientific Computation Program (AMSC)**, University of Maryland. Member of the AMSC graduate committee (2007-present).
- Member of **CSCAMM** awards committee (2007-present). Member of **CSCAMM** personnel committee (2007-present)
- Member of the Department of Mathematics policy committee (2007-08).
- Co-organizer of the Numerical Analysis Seminar (2008-present).
- Founder and co-organizer of the Cancer Dynamics Colloquium (2008).
- Dissertation Committee: Andrew Pomerance (Physics, 2009), Mohamed Ould-Moustapha (AMSC, 2009), Prashant Athavale (AMSC, 2009).

### (b) Stanford University

- A faculty member in the **Mathematical and Computational Science (MCS) program**, Stanford (2000-07).

- Affiliated with the **Bio-X program**, Stanford University.
  - Faculty Member in the **Institute for Computational and Mathematical Engineering (ICME)**, School of Engineering, Stanford University (2005-2007).
  - Core Faculty Member in the **program of Scientific Computing and Computational Mathematics (SCCM)**, School of Engineering, Stanford University (2000-04). Member of the SCCM program graduate admission committee (2002).
  - Co-organizer of the “Women in Math” seminar and related activities.
  - Member of **C-RUM**, the Committee for Review of Undergraduate Majors, Stanford University. (2006-2007).
  - Dissertation Committee: Seung Ha (Math, 2001, reader), Melissa Aczon (SCCM, 2001, reader), Kirsten Boyd (Math, 2002, reader), Paul Tupper (SCCM, 2002, reader), Alex Meadows (Math, 2002), Michael Lee (Radiation Oncology, 2002, chair), Andrei Pugachev (Applied Physics, 2002, chair), Ery Arias-Castro (Statistics, 2003, chair), Dimitrios Cheliotis (Math, 2004), David Li (Math, 2004, reader), Volker Elling (SCCM, 2004, reader), Yanping Pan (Math, 2005, reader), Tamer Zaki (Mechanical Engineering, 2005, chair), Balaji Srinivasan (Aero & Astro, 2005, chair), Yichi Gu (Math, 2005), Inam Rahman (SCCM, 2006), Alex Sotirov (Math, 2006), Suhas Nayak (Math, 2006), Georg May (Aero & Astro, 2006, chair), Sou-Cheng Choi (ICME, 2006, reader), Karthik Palaniappan (Aero & Astro, 2006, chair), Michael Colonna (Aero & Astro, 2007, chair), Arathi Gopinath (Aero & Astro, 2007, chair), Yaniv Konchitchki (Business School, 2007, chair).
  - Organizer of Stanford’s Applied Math Seminar (2001-05).
  - Member of the Department of Mathematics graduate admission committee (2002, 03); space committee (2003); library committee (2004); curriculum committee (2002, 04).
4. **Professional Societies:** American Mathematical Society, Society for Industrial and Applied Mathematics, Society for Mathematical Biology.
  5. **Professional Service:** Member of the AMS Menger Prize Committee (2007-10). This is the committee that judges the mathematical section in the Intel Science Competition.
  6. **Panelist** for various programs at the NSF (2004-present).
  7. **Consultant** for the Advanced Research Program (ARP) of the National Institute on Alcohol Abuse and Alcoholism (NIAAA), 2001.

## Teaching

### 1. Advising.

#### (a) Postdocs:

- Frederic Gibou (Math & CS, now in UC Santa Barbara)
- Yuan-Nan Young (ME, now in New Jersey Tech)

- Carlos Cardenas (Radiation Oncology, now in Siemens, Princeton, New Jersey)
- Razvan Fetecau (Math, now in Simon Fraser University)

(b) Graduate Students:

- Steve Bryson (PhD, Stanford, 2004). Kepler Project, NASA AMES.
- Peter Kim (PhD, Stanford, 2007). Postdoc, University of Utah.
- Dana Paquin (PhD, Stanford, 2007). Assistant Professor, CalPoly.
- Tiago Requeijo (PhD, Stanford, 2007). Options Clearing Corporation, Chicago.
- Amanda Galante (PhD, Maryland).
- Cristian Tomasetti (PhD, Maryland).
- Shelby Wilson (PhD, Maryland).

(c) Undergraduate Students:

- Alexander Kendall (Stanford, Honors thesis, '04)
- Adam Kapelner (Stanford, '05)

## 2. Courses taught.

(a) Graduate Courses

- University of Maryland
  - Numerical Analysis II (AMSC 667).
  - Scientific Computing II (AMSC 661).
- Stanford University
  - Mathematical biology (Math 224). This is a course that I developed.
  - Computational signal processing and wavelets (Math 266). This is a course that I developed.
  - Computational methods for fronts, waves and interfaces (Math 222 A+B). This is a course that I developed.
  - Real analysis (Math 205A).
  - Partial differential equations (Math 220B).
  - Dynamical systems (Reading course).
  - Mathematical problems in image processing (Reading course).
  - Numerical methods for conservation laws (Reading course).

(b) Undergraduate Courses:

- University of Maryland
  - Calculus for life sciences (Math 130).
- Stanford University
  - Nonlinear dynamics and chaos (Math 135). This is a course that I developed.
  - Numerical Analysis (Math 118). This is a course that I developed.
  - Matrix theory and its applications (Math 103).
  - Complex analysis (Math 106).
  - Partial differential equations (Math 131).

- A sophomore seminar: The mathematics of fractals (Math 90Q). This is a course that I developed.
- Linear algebra and calculus of several variable (Math 51).
- Hilbert spaces (Reading course).
- UC Berkeley
  - Introduction to Numerical Analysis (Math 128).
- (c) Continuing Studies Education (Stanford)
  - The mathematics of fractals (Math 06).

### 3. Course development.

- (a) Undergraduate education. Developed a new calculus course for life sciences majors (Math 130) at the University of Maryland. Developed new undergraduate course (Nonlinear dynamics and chaos, numerical analysis). Math 135, Nonlinear dynamics and chaos, is now a required course in the bio-informatics track of the Mathematics and Computational Sciences (MCS) major at Stanford University. Math 118, numerical analysis is an elective course for the engineering track of the Mathematics and Computational Sciences (MCS) major at Stanford University.
- (b) Sophomore seminars. Developed a new sophomore seminar course on the Mathematics of Fractals (2003).
- (c) Graduate education. Developed new graduate courses (Math biology, wavelets, computational methods for fronts waves and interfaces A+B).
- (d) Continuing studies. Developed a new continuing studies education course on the Mathematics of Fractals (2004).

### 4. Lecture notes.

Wrote lecture notes that serve as the text book for Math 118, Numerical Analysis. These notes are available at <http://math.stanford.edu/~dlevy/books/numerical.pdf>.

### 5. Outreach activities.

- (a) Organized with Wolfgang Losert (Biophysics, UMD) a Research Interaction Team on Cancer Dynamics (2008).
- (b) Lectured on geometry to kindergarten students (2008)
- (c) Lectured on applied mathematics to junior-high students as part of the summer activities organized by the Center for Talented Youth (CTY) at the Johns Hopkins University (2001).
- (d) Lectured to high-school students as part of the Stanford University Mathematics Camp (2002, 03, 06).
- (e) Developed and taught a continuing studies education course on the mathematics of fractals (2004).

### Conferences: Organizer (Recent)

1. “Computational Methods for Kinetic and Hyperbolic Problems” (with Pareschi), ICIAM, Sydney, 2003.
2. “Stiff Sources and Numerical Methods for Conservation Laws” (with Perthame), AIM, Palo Alto, 2005.
3. “Numerical Methods for Geophysical Flows” (with Kurganov), SIAM, New Orleans, 2005.
4. “Numerical Methods for Optimal Control in High Dimensions” (with Oberman and Mitchell), AIM, Palo Alto, 2005.
5. “Numerical Methods for Degenerate Elliptic Equations and Applications” (with Souganidis, Oberman and Mitchell), PIMS, Banff, 2006.

### Conferences, Colloquium and Seminar Lectures

1. “1st International Workshop on Differential and Integral Equations with Applications in Biology and Medicine”, Samos, Greece, *September 2010*. (invited)
2. “PDE and Biology”, La Habana University, Havana, Cuba, *February 2010*. (invited)
3. “1st International Workshop on Mathematical Methods in Systems Biology”, Tel Aviv University, *January 2010*. (invited)
4. “Mathematical Developments Arising from Biology”, Mathematical Biosciences Institute, Ohio State University, *November 2009*. (invited)
5. Department of mathematics, University of Chicago, *October 2009*. (invited)
6. Applied Dynamics, University of Maryland, *September 2009*. (invited)
7. “18 Scottish Computational Math Symposium”, Edinburgh, Scotland, *September 2009*. (invited)
8. “Multiscale Analysis of Self-Organization in Biology”, PIMS, Banff, *July 2009*. (invited)
9. First joint meeting of the Society for Mathematical Biology and the Chinese Society for Mathematical Biology, Hangzhou, China, *June 2009*. (invited mini-symposium)
10. “Math-Biology workshop: on building an interdisciplinary career”, University of Utah, *May 2009*. (keynote speaker)
11. Department of mathematics, University of Maryland, Baltimore County, *April 2009*. (invited)
12. Immunology group, Center for Vaccine Development (CVD), University of Maryland, School of Medicine, *April 2009*. (invited)
13. Joe Keller’s 85th Birthday Conference, Stanford University, *October 2008*. (plenary speaker)

14. Department of mathematical sciences, New Jersey Institute of Technology, *October 2008*. (invited)
15. The American Mathematical Society briefing in Capitol Hill, US Congress, *September 2008*. (keynote speaker)
16. “Quantitative Biology”, Howard Hughes Medical Institute, *July 2008*.
17. Twelfth international conference on hyperbolic problems (HYP 2008), University of Maryland, *June 2008*.
18. “Eighth Gathering for Gardner (G4G8)”, Atlanta, *March 2008*. (invited)
19. Department of mathematics, Cornell University, *March 2008*. (invited)
20. IEEE Signal Processing Washington Chapter *November 2007*. (invited)
21. Department of mathematics, University of Arizona, Tucson, *November 2007*. (invited)
22. Department of mathematics, University of Maryland *November 2007*. (invited)
23. FRG meeting on kinetic theory and conservation laws, Stanford University, *July 2007*. (invited)
24. Department of mathematics, University of Maryland, *April 2007*. (invited)
25. Cliford Lectures, Tulane University, *March 2007*. (invited)
26. Department of mathematics, University of Utah, *February 2007*. (invited)
27. Department of mathematics, University of Toronto, *February 2007*. (invited)
28. Department of mathematics, Michigan State University, *January 2007*. (invited)
29. Department of mathematics, University of British Columbia, Vancouver, Canada, *January 2007*. (invited)
30. Department of mathematics, Simon Fraser University, Vancouver, Canada, *January 2007*. (invited)
31. “Numerical Methods for Degenerate Elliptic Equations and Applications” (with Souganidis, Oberman and Mitchell), PIMS, Banff, *December 2006*. (organizer)
32. Department of mathematics, University of Utah, *November 2006*. (invited)
33. Department of applied mathematics, Columbia University, *September 2006*. (invited)
34. Eleventh international conference on hyperbolic problems (HYP 2006), Lyon, France, *July 2006*. (invited speaker)
35. “Mathematical Biology”, Oberwolfach, Germany, *May 2006*. (invited)
36. “Biology and control theory: current challenges”, Toulouse, France, *April 2006*. (invited speaker)

37. Department of mathematics, Arizona State University, Phoenix, *April 2006*. (invited)
38. “Gathering for Gardner (G4G7)”, Atlanta, *March 2006*. (invited)
39. Department of mathematics, Duke University, *February 2006*. (invited)
40. Department of mathematics, Rutgers University, *February 2006*. (invited)
41. Fifth Hawaii International Conference on Statistics, Mathematics, and related fields, Hawaii, *January 2006*
42. American Institute of Mathematics (AIM) workshop on the modeling of cancer progression and immunotherapy, Palo Alto, *December 2005*
43. Center for scientific computing and mathematical modeling (CSCAMM), University of Maryland, *December 2005*. (invited)
44. Department de mathematiques et applications, ENS Paris, France, *November 2005*. (invited)
45. Department of mathematics, UC Berkeley, *November 2005*. (invited)
46. Department of mathematics, University of Michigan, Ann Arbor, *October 2005*. (invited)
47. Department of mathematics, University of Chicago, *October 2005*. (invited)
48. Department of mechanical engineering, UC San Diego, *October 2005*. (invited)
49. Department of mathematics (computational biology), UC Berkeley, *October 2005*. (invited)
50. Seventh Hellenic European conference on computer mathematics and its applications (HERCMA 2005), Athens, Greece, *September 2005*. (invited)
51. American Institute of Mathematics (AIM) workshop on multidimensional Hamilton-Jacobi equations, Palo Alto, *September 2005*. (organizer)
52. Society for Industrial and Applied Mathematics (SIAM) annual meeting, New Orleans, *July 2005*. (mini-symposium organizer)
53. Society for Industrial and Applied Mathematics (SIAM) conference on mathematical & computational geosciences, Avignon, France, *May 2005*
54. American Institute of Mathematics (AIM) workshop on conservation laws with stiff source terms, Palo Alto, *April 2005*. (organizer)
55. Tenth international conference on hyperbolic problems (HYP 2004), Osaka, Japan, *September 2004*
56. Numerical methods for viscosity solutions and applications, Rome, Italy, *September 2004*. (invited plenary talk)
57. Summer workshop on kinetic theory and conservation laws, Stanford University, *July 2004*.

58. Sixth international conference on spectral and high-order methods (ICOSAHOM 04), Brown University, *June 2004*. (invited mini-symposium)
59. Department of mathematics, University of Chicago, *May 2004*. (invited)
60. Analytical and computational challenges of incompressible flows at high Reynolds number, Center for scientific computing and mathematical modeling (CSCAMM), University of Maryland, *May 2004*. (invited)
61. Department of mathematics, North Carolina State University, *April 2004*. (invited)
62. Department of mathematics, Tulane University, *January 2004*. (invited)
63. “Geometrically based motions”, Institute for pure and applied mathematics (IPAM), Lake Arrowhead, CA, *December 2003*. (invited)
64. Institute of applied mathematics, University of British Columbia, Vancouver, Canada, *September 2003*. (invited)
65. Department of computer science, University of British Columbia, Vancouver, Canada, *September 2003*. (invited)
66. Fifth European conference on numerical mathematics (ENUMATH 2003), Prague, *August 2003*.
67. Fifth international conference on industrial and applied mathematics (ICIAM 2003), Sydney, Australia, *July 2003*. (mini-symposium organizer)
68. Department of mathematics, UC Davis, *June 2003*. (invited)
69. Department of mathematics, Stanford University, *May 2003*
70. Department of mathematics, UC Irvine, *May 2003*. (invited)
71. Department of mathematics, UCLA, *May 2003*. (invited)
72. Scientific computing and computational mathematics (SCCM) colloquium, Stanford University, *February 2003*. (invited)
73. “Equation de Saint Venant”, Journées Savoisiennes de Mathématiques Appliquées, Bourget-du-Lac, France, *May 2002*. (invited plenary talk)
74. Ninth international conference on hyperbolic problems (HYP 2002), CalTech, *March 2002*
75. Fourth European conference on numerical mathematics (ENUMATH 2001), Ischia, Italy, *July 2001*
76. Conservation laws workshop, Stanford University, *July 2001*
77. Society for Industrial and Applied Mathematics (SIAM) annual meeting, San Diego, *July 2001*. (invited mini-symposium)

78. “Geometrically based motions” workshop, Institute for pure and applied mathematics (IPAM), Lake arrowhead, CA, *June 2001*. (invited)
79. TMR final conference on hyperbolic systems of conservation laws, Paris, France, *September 2000*
80. Nonlinear analysis 2000, Courant Institute, New York University, *May 2000*. (invited)
81. Department of mathematics, UC Berkeley *March 2000*. (invited)
82. Bay area scientific computing day, Lawrence Berkeley Lab, *February 2000*. (invited)
83. Department of mathematics, University of Texas, Austin, *February 2000*. (invited)
84. Department of mathematics, University of Arizona, Tucson, *February 2000*. (invited)
85. Department of mathematics, Purdue University, *February 2000*. (invited)
86. Department of mathematics, UC Santa Barbara, *February 2000*. (invited)
87. Department of mathematics, University of Minnesota, Minneapolis, *January 2000*. (invited)
88. Department of mathematics, UC Davis, *January 2000*. (invited)
89. Department of mathematics, University of Illinois, Urbana-Champaign, *January 2000*. (invited)
90. Department of mathematics, University of Michigan, Ann Arbor, *December 1999*. (invited)
91. Department of mathematics, University of Wisconsin, Madison, *November 1999*. (invited)
92. Fourth international conference on industrial and applied mathematics (ICIAM 99), Edinburgh, *July 1999*. (invited mini-symposium)
93. Lawrence Berkeley national laboratory, UC Berkeley, *October 1998*
94. Lawrence Berkeley national laboratory, UC Berkeley, *September 1998*
95. Summer school on “Theoretical and numerical aspects of hyperbolic systems”, FORTH, Heraklion, Crete, Greece, *July 1998*
96. Fourth international conference on spectral and high-order methods (ICOSAHOM 98), Herzliya, Israel, *June 1998*
97. Institute for applied mathematics, University of Bonn, Germany, *June 1998*. (invited)
98. TMR second Euroconference on hyperbolic systems of conservation laws, Trieste, Italy, *May 1998*
99. INRIA school on hyperbolic systems, France, *March 1998*. (invited)

100. College de polytechnique, Paris, France, *February 1998*. (invited)
101. Laboratoire d'analyse numerique, Universite Pierre et Marie Curie (Paris 6), Paris, France, *February 1998*. (invited)
102. Department de mathematiques et d'informatique, ENS Paris, France, *January 1998*. (invited)
103. Fifth incontro nazionale sulle equazioni iperbolich, L'Aquila, Italy, *November 1997*
104. School of mathematical sciences, Tel Aviv University, Israel, *June 1997*
105. Courant institute of mathematical sciences, New York University, *December 1996*. (invited)
106. Lawrence Berkeley national laboratory, UC Berkeley, *December 1996*. (invited)
107. Department of mathematics, UCLA, *December 1996*. (invited)
108. Department of applied mathematics, CalTech, *November 1996*. (invited)

#### **Other Conferences (Presented by collaborators)**

1. European Conference on Mathematical and Theoretical Biology, Edinburgh, UK, *June 2008*
2. "Mathematical Perspective on Cancer Immunology", University of Utah, *May 2008*
3. SIAM Meeting on Control Theory, San Francisco, *July 2007*
4. SIAM Conference on Dyanmical Systems, Park City, Utah, *June 2007*
5. ASTRO 2006, American Society for Therapeutic Radiology and Oncology, 48th Annual Meeting, Philadelphia, *November 2006*
6. AAPM 2006, American Association of Physicists in Medicine, 48th Annual Meeting, Orlando, *July 2006*
7. MTNS 2006, 17th International Symposium on Mathematical Theory of Networks and Systems, Kyoto, *July 2006*
8. Joint SMB-SIAM Meeting on the Life Sciences, Raleigh, *July 2006*
9. SIAM Annual Meeting, Boston, *July 2006*
10. SIAM Conference on Imaging Science, Minneapolis, *May 2006*
11. AAPM 2005, American Association of Physicists in Medicine, 47th Annual Meeting, Seattle, *July 2005*
12. International Conference on Differential Equations and Applications in Mathematical Biology, Nanaimo, British Columbia, Canada, *July 2004*

13. ASTRO 2003, American Society for Therapeutic Radiology and Oncology, 45th Annual Meeting, Salt Lake City, *October 2003*
14. AAPM 2003, American Association of Physicists in Medicine, 45th Annual Meeting, San Diego, *August 2003*
15. CARS 2003, Computer Assisted Radiology and Surgery, 17th International Congress, London, UK, *June 2003*
16. ASTRO 2002, American Society for Therapeutic Radiology and Oncology, 44th Annual Meeting, New Orleans, *October 2002*

## Doron Levy

### List of Publications

All papers can be downloaded from <http://www.math.umd.edu/~dlevy>

1. D. LEVY AND E. TADMOR, *Non-Oscillatory Central Schemes for the Incompressible 2D Euler Equations*, Mathematical Research Letters, **4** (1997), pp.321–340.
2. D. LEVY AND P. ROSENAU, *On a Class of a Thermal Blow-up Patterns*, Physics Letters A, **236** (1997), pp.483–493.
3. D. LEVY AND E. TADMOR, *From Semi-Discrete to Fully-Discrete: The Stability of Runge-Kutta Schemes by the Energy Method*, SIAM Review, **40**, no. 1 (1998), pp.40–73.
4. A. KURGANOV, D. LEVY AND P. ROSENAU, *On Burgers-type Equations with Non-Monotonic Dissipative Fluxes*, Communications on Pure and Applied Mathematics, **51**, no. 5 (1998), pp.443–473.
5. D. LEVY, *A Third-order 2D Central Scheme for Hyperbolic Conservation Laws*, INRIA School on Hyperbolic Systems, Vol. I, (1998), pp.489–504.
6. G.-S. JIANG, D. LEVY, C.-T. LIN, S. OSHER AND E. TADMOR, *High-Resolution Non-Oscillatory Central Schemes with Non-Staggered Grids for Hyperbolic Conservation Laws*, SIAM Journal on Numerical Analysis, **35**, no. 6 (1998), pp.2147–2168.
7. G. FIBICH AND D. LEVY, *Self-Focusing in the Complex Ginzburg-Landau Limit of the Critical Nonlinear Schrödinger Equation*, Physics Letters A, **249** (1998), pp.286–294.
8. P. ROSENAU AND D. LEVY, *Compactons in a Class of Nonlinearly Quintic Equations*, Physics Letters A, **252** (1999), pp.297–306.
9. T. KATSAOUNIS AND D. LEVY, *A Modified Structured Central Scheme for 2D Hyperbolic Conservation Laws*, Applied Mathematics Letters, **12**, no. 6 (1999), pp.89–96.
10. D. LEVY, G. PUPPO AND G. RUSSO, *Central WENO Schemes for Hyperbolic Systems of Conservation Laws*, Mathematical Modelling and Numerical Analysis, **33**, no. 3 (1999), pp.547–571.
11. Y. BRENIER AND D. LEVY, *Dissipative Behavior of Some Fully Non-Linear KdV-Type Equations*, Physica D., **137** (2000), pp.277–294.
12. D. LEVY, G. PUPPO AND G. RUSSO, *A Third Order Central WENO Scheme for 2D Conservation Laws*, Applied Numerical Mathematics, **33** (2000), pp.407–414.
13. D. LEVY, G. PUPPO AND G. RUSSO, *On the Behavior of the Total Variation in CWENO Methods for Conservation Laws*, Applied Numerical Mathematics, **33** (2000), pp.415–421.
14. A. CHORIN, R. KUPFERMAN AND D. LEVY, *Optimal Prediction for Hamiltonian Partial Differential Equations*, Journal of Computational Physics, **162** (2000), pp.267–297.

15. D. LEVY, G. PUPPO AND G. RUSSO, *Compact Central WENO Schemes for Multidimensional Conservation Laws*, SIAM Journal on Scientific Computing, **22** no. 2, (2000), pp.656–672.
16. 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** no. 4, (2000), pp.1461–1488.
17. A. CHERTOCK AND D. LEVY, *Particle Methods for Dispersive Equations*, Journal of Computational Physics, **171** no. 2, (2001), pp.708–730.
18. A. KURGANOV AND D. LEVY, *Central-Upwind Schemes for the Saint-Venant System With a Source Term*, Mathematical Modelling and Numerical Analysis, **36** no. 3, (2002), pp.397–425.
19. D. LEVY, G. PUPPO AND G. RUSSO, *Central WENO Schemes for Multi-Dimensional Hyperbolic Systems of Conservation Laws*, SIAM Journal on Scientific Computing, **24** no. 2, (2002), pp.480–506.
20. S. BRYSON AND D. LEVY, *High-Order Semi-Discrete Central-Upwind Schemes for Multi-dimensional Hamilton-Jacobi Equations*, Journal of Computational Physics, **189** (2003), pp.63–87.
21. S. BRYSON AND D. LEVY, *High-Order Central WENO Schemes for Multi-dimensional Hamilton-Jacobi Equations*, SIAM Journal Numerical Analysis, **41** (2003), pp.1339–1369.
22. S. BRYSON AND D. LEVY, *Central Schemes for Multi-dimensional Hamilton-Jacobi Equations*, SIAM Journal on Scientific Computing, **25** (2003), pp.767–791.
23. D. LEVY, C.-W. SHU, AND J. YAN, *Local Discontinuous Galerkin Methods for Nonlinear Dispersive Equations*, Journal of Computational Physics, **196** (2004), pp.751–772.
24. A. CHERTOCK AND D. LEVY, *On Wavelet-Based Numerical Homogenization*, Multiscale Modeling and Simulation, **3** (2004), pp.65–88.
25. Y.-N. YOUNG AND D. LEVY, *Registration-Based Morphing of Active Contours for Segmentation of CT Scans*, Mathematical Biosciences and Engineering, **2** (2005), pp.79–96.
26. 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.87–112.
27. S. BRYSON, A. KOSOVICHEV, AND D. LEVY, *High-Order Shock Capturing Methods for Modelling Dynamics of the Solar Atmosphere*, Physica D., **201** (2005), pp.1–26.
28. Z. SHOU, Y. YANG, C. COTRUTZ, D. LEVY, AND L. XING, *Quantitation of the A Priori Dosimetric Capabilities of Spatial Points in Inverse Planning and its Significant Implication in Defining IMRT Solution Space*, Physics in Medicine and Biology, **50** (2005), pp.1469–1482.

29. F. GIBOU, D. LEVY, C. CARDENAS, P. LIU, AND A. BOYER, *PDE-based Segmentation for Radiation Therapy Treatment Planning*, *Mathematical Biosciences and Engineering*, **2** (2005), pp.209–226.
30. R. FETECAU AND D. LEVY, *Approximate Model Equations for Water Waves*, *Communications in Mathematical Sciences*, **3** (2005), pp.159–170.
31. D. LEVY, *A Stable Semi-Discrete Central Scheme for the Two-Dimensional Incompressible Euler Equations*, *IMA Journal of Numerical Analysis*, **25** (2005), pp.507–522.
32. S. BRYSON AND D. LEVY, *Balanced Central Schemes for the Shallow Water Equations on Unstructured Grids*, *SIAM Journal on Scientific Computing*, **27** (2005), pp.532–552.
33. R. DECONDE, P. KIM, D. LEVY, AND P. LEE, *Post Transplantation Dynamics of the Immune Response to Chronic Myelogenous Leukemia*, *Journal of Theoretical Biology*, **236** (2005), pp.39–59.
34. D. PAQUIN, D. LEVY, E. SCHREIBMANN, AND L. XING, *Multiscale Image Registration*, *Mathematical Biosciences and Engineering*, **3** (2006), pp.389–418.
35. D. LEVY, S. NAYAK, C.-W. SHU, AND Y.-T. ZHANG, *Central WENO Schemes for Hamilton-Jacobi Equations on Triangular Meshes*, *SIAM Journal on Scientific Computing*, **28** (2006), pp.2229–2247.
36. P. KIM, P. LEE, AND D. LEVY, *Modeling Regulation Mechanisms in the Immune System*, *Journal of Theoretical Biology*, **246** (2007), pp. 33–69.
37. D. PAQUIN, D. LEVY, AND L. XING, *Hybrid Multiscale Landmark and Deformable Registration*, *Mathematical Biosciences and Engineering*, **4** (2007), pp. 711–737.
38. D. LEVY AND T. REQUEIJO, *Modeling Group Dynamics of Phototaxis: From Particles to PDEs*, *Discrete and Continuous Dynamical Systems B*, **9** (2008), pp. 103–128.
39. D. PAQUIN, D. LEVY, AND L. XING, *Multiscale Deformable Registration of Noisy Medical Images*, *Mathematical Biosciences and Engineering*, **5** (2008), pp.125–144.
40. P. KIM, P. LEE, AND D. LEVY, *Modeling Imatinib-Treated Chronic Myelogenous Leukemia: Reducing the Complexity of Agent-Based Models*, *Bulletin of Mathematical Biology*, **70** (2008), pp.728–744.
41. P. KIM, P. LEE, AND D. LEVY, *Dynamics and Potential Impact of the Immune Response to Chronic Myelogenous Leukemia*, *PLOS Computational Biology*, **4** (2008), e1000095 doi:10.1371/journal.pcbi.1000095.
42. D. LEVY AND T. REQUEIJO, *Stochastic Models for Phototaxis*, *Bulletin of Mathematical Biology*, **70** (2008), pp.1684–1706.
43. P. KIM, P. LEE, AND D. LEVY, *A PDE Model for Imatinib-Treated Chronic Myelogenous Leukemia*, *Bulletin of Mathematical Biology*, **70** (2008), pp.1994–2016.
44. D. PAQUIN, D. LEVY, AND L. XING, *Multiscale Registration of Planning CT and Daily Cone Beam CT for Adaptive Radiation Therapy*, *Medical Physics*, **36** (2009), pp.4–11.

45. S.Y. HA AND D. LEVY, *Particle, Kinetic, and Fluid Models for Phototaxis*, Discrete and Continuous Dynamical Systems B, **12** (2009), pp.77–108.
46. M. PEET, P. KIM, S.-I. NICULESCU, AND D. LEVY, *New Computational Tools for Modeling Chronic Myelogenous Leukemia*, Mathematical Modeling of Natural Phenomena, **4** (2009), pp.48–68.
47. S.Y. HA, K. LEE, AND D. LEVY, *Emergence of Time-Asymptotic Flocking in a Stochastic Cucker-Smale System*, Communications in Mathematical Sciences, **7** (2009), pp.453–469.
48. P. KIM, D. LEVY, AND P. LEE, *Modeling and Simulation of the Immune System as a Self-Regulating Network*, Methods in Enzymology, Computer Methods B, accepted.
49. S. NICULESCU, P. KIM, K. GU, P. LEE, AND D. LEVY, *Stability Crossing Boundaries of Delay Systems Modeling Immune Dynamics in Leukemia*, Discrete and Continuous Dynamics Systems B, **13** (2010), pp.129–156.
50. P. KIM, P. LEE, AND D. LEVY, *Emergent Group Dynamics Governed by Regulatory Cells Produce a Robust Primary T Cell Response*, Bulletin of Mathematical Biology, accepted.
51. A. JOHANNSEN, N. YAN, P. KIM, D. PAQUIN, D. LEVY, AND P. LEE *Dynamics and Functional Discrepancies in CD4 and CD8 T Cell Responses to EBV in Acute Infectious Mononucleosis*, submitted.
52. C. TOMASETTI AND D. LEVY, *Modeling Drug Resistance in Cancer*, submitted.
53. D. PAQUIN, P. KIM, P. LEE, AND D. LEVY *Strategic Treatment Interruptions During Imatinib Treatment of Chronic Myelogenous Leukemia*, submitted.

## Refereed Conference Proceedings

1. S. BRYSON AND D. LEVY, *High-order Central WENO Schemes for 1D Hamilton-Jacobi Equations*, in F. Brezzi *et al.* (Eds.), “Numerical Mathematics and Advanced Applications”, Proceedings of ENUMATH 2001, Ischia, Italy; Springer-Verlag, Italy, 2003, pp.45–54.
2. A. CHERTOCK AND D. LEVY, *A Particle Method for the KdV Equation*, Proceedings of ICOSAHOM 2001, Journal of Scientific Computing, **17** no 1–4, (2002), pp.491–499.
3. S. BRYSON AND D. LEVY, *High-Order Central WENO Schemes for Multi-dimensional Hamilton-Jacobi Equations*, in T.Y. Hou and E. Tadmor (Eds.), “Hyperbolic Problems: Theory, Numerics, Applications”, Proceedings of the Ninth International Conference on Hyperbolic Problems, CalTech, 2002; Springer-Verlag, Berlin, 2003, pp.387–396.
4. D. LEVY AND S. NAYAK, *Central Schemes for Hamilton-Jacobi Equations on Unstructured Grids*, in M. Feistauer *et al.* (Eds.), “Numerical Mathematics and Advanced Applications”, Proceedings of ENUMATH 2003, Prague, Czech Republic; Springer-Verlag, Berlin, 2004, pp.623–630.

5. S. BRYSON AND D. LEVY, *On the Total Variation of High-Order Semi-Discrete Central Schemes for Conservation Laws*, Proceedings of ICOSAHOM 2004, Journal of Scientific Computing, **27** (2006), pp.163–175.
6. S. BRYSON AND D. LEVY, *Mapped WENO and Weighted Power ENO Reconstructions in Semi-Discrete Central Schemes for Hamilton-Jacobi Equations*, Proceedings of “Numerical Methods for Viscosity Solutions and Applications”, Rome 2004, Applied Numerical Mathematics, **56** (2006), pp.1211–1224.
7. S.-I. NICULESCU, P. KIM, K. GU, AND D. LEVY, *On the Stability Crossing Boundaries of Some Delay Systems Modeling Immune Dynamics in Leukemia*, Proceedings of the 17th International Symposium on Mathematical Theory of Networks and Systems, Kyoto, MTNS 2006.
8. S.-I. NICULESCU, P. KIM, P. LEE, AND D. LEVY, *On Stability of a Combined Gleevec and Immune Model of Chronic Myelogenous Leukemia: Exploiting Delay System Structure*, Proceedings of the 2007 IFAC Symposium on Nonlinear Control (NOLCOS '07), Pretoria, South Africa.
9. P. KIM, P. LEE, AND D. LEVY, *Mini-Transplants for Chronic Myelogenous Leukemia: A Modeling Perspective*, in “Biology and control theory: current challenges”, Queinnec *et al.* (eds.), Lecture Notes in Control and Information Sciences, LNCIS 357, Springer, Berlin, 2007, pp. 3–20.
10. D. BHAYA, D. LEVY AND T. REQUEIJO, *Group Dynamics of Phototaxis: Interacting Stochastic Many-Particles Systems and their Continuum Limit*, in S. Benzoni-Gavage and D. Serre (Eds.), “Hyperbolic Problems: Theory, Numerics, Applications”, Proceedings of the Eleventh International Conference on Hyperbolic Problems, Lyon, 2006; Springer-Verlag, Berlin, 2008, pp.145–159.