

# NC STATE UNIVERSITY

## ALINA CHERTOCK - CURRICULUM VITAE

### AFFILIATION

Department of Mathematics, **North Carolina State University**

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### RESEARCH INTERESTS

Applied Nonlinear Partial Differential Equations, Scientific Computing, Numerical Analysis, Multiscale Models, Uncertain Phenomena, Machine Learning.

### EDUCATION

1991–1999 **Ph.D., Applied Mathematics**, School of Mathematical Sciences, Tel-Aviv University, Israel  
1984–1989 **M.Sc.** (Diploma of Higher Education), **Applied Mathematics**, Faculty of Computational Mathematics and Cybernetics, Lomonosov Moscow State University, Moscow, U.S.S.R

### ACADEMIC EMPLOYMENT

2021–present **LeRoy B. Martin, Jr. Distinguished Professor**, Department of Mathematics, NC State University  
2017–present **Associate Director**, Center for Research in Scientific Computation, NC State University  
2015–present **Department Head**, Department of Mathematics, NC State University  
Summer 2016 **Simons Visiting Professor**, Institute of Applied Analysis and Numerical Simulation, University of Stuttgart, Germany  
Summer 2014 **Visiting Professor**, Institute of Mathematics, University of Mainz, Germany  
2013–2021 **Professor**, Department of Mathematics, NC State University  
2012–2019 **Adjunct Professor**, Moscow Institute of Physics and Technology, Moscow, Russia  
Summer 2012 **Visiting Professor**, Department of Mathematics, Jiao Tong University, Shanghai, China

2010–2011	<b>Visiting Professor</b> , Institut de Mathématiques de Toulouse, Université Paul Sabatier, Toulouse, France
2007–2013	<b>Associate Professor</b> , Department of Mathematics, NC State University
2007–2009	<b>Visiting Associate Professor</b> , Division of Applied Mathematics, Brown University
2002–2007	<b>Assistant Professor</b> , Department of Mathematics, NC State University
2001–2002	<b>Visiting Assistant Professor</b> , Department of Mathematics, University of California, Berkeley
1999–2001	<b>Postdoctoral Fellow</b> , Department of Mathematics, University of California, Berkeley <b>Postdoctoral Fellow</b> , Department of Mathematics, Lawrence Berkeley National Laboratory, Berkeley
1996–1999	<b>Instructor</b> , School of Mathematical Sciences, Tel-Aviv University, Israel <b>Instructor</b> , The Academic College of Tel-Aviv-Yaffo, Tel-Aviv, Israel
1991–1996	<b>Teaching Assistant</b> , School of Mathematical Sciences, Tel-Aviv University, Israel

## AWARDS, HONORS AND GRANTS

2023	<b>Fellow of the Society for Industrial and Applied Mathematics (SIAM)</b>
2022–2025	<b>NSF Research Grant DMS-2208438</b> : “ <i>Development and Application of Modern Numerical Methods for Nonlinear Hyperbolic Systems of Partial Differential Equations</i> ”, PI, NC State University
2018–2023	<b>NSF Research Grant DMS-1818684</b> : “ <i>Structure Preserving Numerical Methods for Hyperbolic Balance Laws with Applications to Shallow Water and Atmospheric Models</i> ”, PI, NC State University
2015–2018	<b>NSF Research Grant DMS-1521051</b> : “ <i>Numerical Methods for Partial Differential Equations Arising in Shallow Water Modeling</i> ”, PI, NC State University
2014	<b>ONR Conference Grant N00014-14-1-0308</b> : “ <i>Modern Perspectives in Applied Mathematics: Theory and Numerics of PDEs</i> ”, PI, NC State University
2012, 2013	<b>Research Award</b> , College of Sciences, NC State University
2012–2016	<b>NSF Research Grant DMS-1216974</b> : “ <i>Numerical Methods for Shallow Water Equations and Related Models</i> ”, PI, NC State University
2012–2015	<b>ONR Research Grant N00014-12-1-0832</b> : “ <i>Numerical Methods for Shallow Water Equations and Related Models</i> ”, PI, NC State University
2012–2020	<b>NSF Research Network in Mathematical Sciences RNMS-11-07444</b> : “ <i>Kinetic Description of Emerging Challenges in Multiscale Problems of Natural Sciences</i> ”, leading the NC State University node
2011–2015	<b>NSF Research Grant DMS-1115682</b> : “ <i>Development of High-Resolution Finite-Volume Methods for Systems of Nonlinear Time-Dependent PDEs</i> ”, PI, NC State University
2007–2011	<b>NSF Research Grant DMS-0712898</b> : “ <i>Innovative Numerical Methods for Nonlinear Time-Dependent PDEs</i> ”, PI, NC State University
2007	<b>SIAM Travel Award</b> to attend the International Congress of Industrial and Applied Mathematics, Zürich, Switzerland

2006	<b>AMS Travel Award</b> to attend the International Congress of Mathematicians, Madrid, Spain
2004	<b>Association for Women in Mathematics – National Science Foundation (AWM-NSF) Travel Grant</b>
2004–2008	<b>NSF Research Grant DMS-0410023:</b> <i>“Particle Methods for Nonlinear Time-Dependent PDEs”</i> , PI, NC State University
2003–2004	<b>Faculty Research and Professional Development Award</b> , NC State University
2002	<b>American Mathematical Society Travel Award</b> to attend the International Congress of Mathematicians, Beijing, China
1998	<b>The Ami Harten Award</b> for Excellence in Applied Mathematics Graduate Studies, Tel-Aviv University, Israel
1997	<b>The Nathan and Ruth El Josef Award</b> for Teaching Excellence, Tel-Aviv University, Israel
1993–1996	<b>The Josef Buchmann Doctoral Scholarship Fund</b> in Mathematics and Computer Sciences, Israel

## PROFESSIONAL ACTIVITIES

- *Professional Service on Campus:*

- Chair of the Department Head Advisory Committee to the Provost, 2024–present
- Chair of the College of Sciences Professors of Distinction Committee, 2022–present.
- Panelist on several New University Department Head and New Faculty Orientation Sessions, 2019–2020.
- Member of the Operations Research Program Task Force, 2020.
- Member of the Department Head Advisory Committee to the Provost, 2019–2023.
- Chair of the Search Committee for the Head of the MEAS Department, 2016–2017, 2023–2024.
- Member of the Search Committee for the Director of the Operational Research Program, 2017–2018.
- Co-chair of the Search Committee for the Director of the Operational Research Program, 2022–2023.
- Member of the Science and Engineering Mentor Rings Planning Team, 2016–2017.
- Member of the Provost’s Task Force on Statements of Mutual Expectations, 2016–2017.
- Chair of the Search Committee for the Head of the Department of Statistics, 2016–2017.
- Member of the Faculty Advisory Committee (FAC), Department of Mathematics, 2007–2009, 2012–2014.
- Member of the Hiring Committee, Department of Mathematics, every year during 2005–2015.
- Chair of the Hiring Committee, Department of Mathematics, 2013–2014.
- Member of the Graduate Program Committee, Department of Mathematics, 2009–2012, 2015–2016.
- Member of the Graduate Recruitment Committee, Department of Mathematics, 2009–2012, 2015–2016.
- Member of the Undergraduate Course & Curriculum Committee, Department of Mathematics, 2010–2012, 2015–2016.

- Member of PhD Qualifying Exam Committee, Department of Mathematics, 2005–2016.
- Member of the Math Distinguished Lecture Series, Department of Mathematics, 2014–2016.
- Mentor of Teaching Assistants, Department of Mathematics.
- Member of the Center for Research in Scientific Computing, 2002–present.
- Organizer of the Numerical Analysis Seminar, Department of Mathematics, 2003–2005.

• *Professional Service off Campus:*

- Referee for scientific journals: Applicable Analysis, Applied Numerical Mathematics, Computers and Fluids, Communications on Applied Mathematics and Computation, Communications in Mathematical Sciences, Foundations of Computational Mathematics, IMA Journal of Numerical Analysis, International Journal of Computational Methods, International Journal for Numerical Methods in Fluids, Journal of Heat and Mass Transfer, Journal of Computational Physics, Journal of Computational and Applied Mathematics, Journal of Differential Equations, Journal of Mathematical Analysis and Applications, Journal of Scientific Computing, Journal of Statistical Physics, Mathematical Modelling and Numerical Analysis (M2AN), Mathematics and Computers in Simulation, Molecular Biology and Evolution, Mathematics of Computation, Numerische Mathematik, Physica Letter A, Proceedings of National Academy of Sciences (PNAS), SIAM Journal of Applied Mathematics, SIAM Journal of Multiscale Modeling and Simulation, SIAM Journal of Numerical Analysis, SIAM Journal of Scientific Computing, Studies in Applied Mathematics, Theoretical and Computational Fluid Dynamics.
- Reviewer for the Department of Energy, Air Force Office of Scientific Research, United States-Israel Binational Science Foundation, French Institute for Research in Computer Science and Automation (INRIA), European Research Council, Department of Mathematics at the Ohio State University, Division of Computational Mathematics at the Stockholm University.
- Panelist on Mathematical and Interdisciplinary NSF panels, 2006–2021.
- Secretary of the Applied PDE Activity Group, Society of Industrial and Applied Mathematics (SIAM), 2018.
- Member of the Committee of Academic Sponsors and Executive Subcommittee, Mathematical Sciences Research Institute (MSRI), 2021–2024.
- Member of an International Evaluation Committee for the French Institute for Research in Computer Science and Automation (INRIA), 2014, 2017, 2022.
- Member of the Scientific Committee of the Research Team AGNE (Numerical Analysis, Geophysics and Ecology), French Institute for Research in Computer Science and Automation (INRIA), 2013–present.

• *Editorial responsibilities:*

- Mathematics and Computers in Simulation, Editor, 2022–present.
- Communications in Mathematical Research, Associate Editor, 2020–present.
- Kinetic and Related Models, Associate Editor, 2019–present.
- SIAM Journal on Applied Mathematics, Associate Editor, 2017–present.
- Journal of Scientific Computing, Guest Editor.
- Communications in Computational Physics, Guest Editor.

- *Professional Societies:*
  - Society of Industrial and Applied Mathematics (SIAM).
  - SIAM Applied PDE activity group.
  - SIAM Nonlinear Waves and Coherent Structures activity group.
  - SIAM Geosciences activity group.
  - SIAM Prize Selection Committee.
  - Association for Women in Mathematics (AWM).
  - AWM-SIAM Kovalevsky Lecture Selection Committee.
  - American Mathematical Society (AMS).
  - Sigma Xi, The Scientific Research Honor Society.

## MENTORING ACTIVITIES

- *Current Ph.D. Students*
  - Safa Janajra, Department of Mathematics, 2020–present.
- *Former Ph.D. Students*
  - Michael Redle, Department of Mathematics, 2021–2023.
  - Christopher Leonard, Department of Mathematics, 2019–2022.
  - Hengrui Hu, Department of Mathematics, 2014–2022.
  - Jun Yan, Department of Mathematics, 2015–2021.
  - Karlan Wolfkill, Department of Mathematics, 2015–2019.
  - Andrew Bernstein, Department of Mathematics, 2013–2018.
  - Seyma Nur Oszan, Department of Mathematics, 2013–2017.
  - Terrance Pendleton, Department of Mathematics, 2009–2013.
  - Sean Cohen, Department of Mathematics, 2008–2011.
- *Visiting Ph.D. Students*
  - Jochen Neusser, Institute for Applied Analysis and Numerical Simulation, University of Stuttgart, Fall 2014.
  - Bettina Wiebe, Department of Mathematics, University of Mainz, Spring 2018.
  - Yogiraj Mantri, RWTH Aachen University, Spring 2019.
- *Postdoctoral Fellows*
  - Lorenzo Micalizzi, Department of Mathematics, 2024–present.
  - Arsen Iskhakov, Department of Mathematics, 2023–present.
  - Hengrui Hu, Department of Mathematics, 2023–present.
  - Pedro Aceves Sanchez, Department of Mathematics, 2019–2021.
  - Tong Wu, Department of Mathematics, 2016–2018.
  - Daniel Balagué, Department of Mathematics, 2013–2015.

- *Ph.D. Committees at NC State University*

- Evangelia Ftaka, Department of Mathematics, 2024–present.
- Andrew Murdza, Department of Mathematics, 2024–present.
- Joseph Coale, Department of Nuclear Engineering, 2021–2022.
- Fouche Smith, Department of Mathematics, 2020–2022.
- Evan North, Department of Mathematics, 2020–2022.
- Steven Gilmore, Department of Mathematics, 2020–2021.
- Daniel Reich, Department of Mathematics, 2018–2020.
- Deena Hannoun, Department of Mathematics, 2016–2017.
- Melissa Strait, Department of Mathematics, 2014–2017.
- Alper Altuntas, Department of Civil, Construction, and Environmental Engineering, 2014–2016.
- Elisabeth Brown, Department of Mathematics, 2015–2016.
- Darrell Britt, Department of Mathematics, 2014–2015.
- Anne Costolanski, Department of Mathematics, 2012–2013.
- Elgaddafi Elamami, Department of Mathematics, 2012–2013.
- Guanyu Chen, Department of Mathematics, 2012–2013.
- Sidong Max Zhang, Department of Mathematics, 2011–2013.
- Shijun Yin, Department of Mathematics, 2011–2012.
- Min-Hsiung Lin, Department of Mathematics, 2009–2010.
- Cary Humber, Department of Mathematics, 2009–2010.
- Ellen Peterson, Department of Mathematics, 2009–2010.
- Nicholas Giffen, Department of Mathematics, 2010.
- Jeb Collins, Department of Mathematics, 2010.
- Kristen DeVault, Department of Mathematics, 2007–2008.
- Stacey Ernstberger, Department of Mathematics, 2006–2007.
- Arthur W. Peterson, Department of Mathematics, 2005–2006.
- Wang Qiqi, Department of Textile & Apparel Technology & Management, 2005–2006.
- Edward L. Row, Department of Mathematics, 2005.
- Shufen Cao, Department of Mechanical and Aerospace Engineering, 2005.
- Rachel Levy, Department of Mathematics, 2004–2005.
- Sid Becker, Department of Mechanical Engineering, 2003–2004.

- *MSc Committees at NC State University*

- Rylan Paye, Department of Nuclear Engineering, 2024.
- Joseph Coale, Department of Nuclear Engineering, 2019.

- William Oakley, Department of Mathematics, 2014.
- William Lee, Department of Mechanical Engineering, 2008.
- Chris Brasfield, Department of Mathematics, 2008.
- *Ph.D. Committees at Other Institutions*
  - Mirco Ciallella, Department of Mathematics, University of Bordeaux, 2022.
  - Luca Arpaia, Department of Mathematics, University of Bordeaux, 2017.
  - Yuanzhen Chen, Department of Mathematics, Tulane University, 2015–2016.
  - Aziz Beljadid, Department of Civil Engineering, Ottawa University, 2015.
  - Zhuolin Qu, Department of Mathematics, Tulane University, 2015–2016.
  - Yu Liu, Department of Mathematics, Tulane University, 2010–2012.
  - Michael Polack, Department of Mathematics, Tulane University, 2010–2011.

## SPECIAL PROJECTS WITH STUDENTS

- Studying Successful Doctoral Students in Mathematics from Underrepresented Groups, Advisory Board of the NSF project, 2019–2020.
- Organizer of an International Student Seminar on "Structure-Preserving Methods for Nonlinear Hyperbolic Problems", Research Institute for Mathematics, Oberwolfach, Germany, November 24–29, 2019.
- Mentor for the Research Experience for Early Graduate Students (REG) program, Department of Mathematics, NC State University, 2011–2012, 2012–2013, and 2013–2014.
- Mentor for the Preparing the Professoriate (PTP) program, Department of Mathematics, NC State University, 2010–2011, 2012–2013, and 2014–2015.
- Program on Stochastic Dynamics, Statistical and Applied Mathematical Sciences Institute (SAMSI), 2009–2010.
- Research Industrial Projects for Students (RIPS), Institute of Pure and Applied Mathematics (IPAM), University of California, Los Angeles, July–August, 2003.
- Industrial Mathematical and Statistical Modeling Workshop for Graduate Students, Department of Mathematics and Center for Research in Scientific Computation, NC State University, July 25–August 2, 2005.
- Industrial Mathematical and Statistical Modeling Workshop for Graduate Students, Department of Mathematics and Center for Research in Scientific Computation, NC State University, July 24–August 1, 2006.

## CONFERENCES, WORKSHOPS AND MINISYMPOSIA: ORGANIZER

1. Workshop on Recent Advances in Numerical Methods for Hyperbolic Conservation Laws, Shenzhen International Center of Mathematics, SUSTech, China, December 9–15, 2023.
2. Minisymposium on Recent Advances in Numerical Methods for Nonlinear Hyperbolic PDEs, the 10th International Congress on Industrial and Applied Mathematics, Waseda University, Tokyo, Japan, August 20–25, 2023.
3. Conference on Numerical Aspects of Hyperbolic Balance Laws and Related Problems, Cortona, Italy, June 18–24, 2023.

4. Workshop on Kinetic Equations: Recent Developments and Novel Applications, Oaxaca Mexico, October 30–November 4, 2022.
5. Triangle Computational and Applied Mathematics Symposium, NC State University, September 17–18, 2022.
6. Minisymposium on Well-Balanced Numerical Discretizations of Geophysical Models, SIAM Conference on Mathematical & Computational Issues in the Geosciences, virtually, June 21–24, 2021.
7. SIAM Conference on Analysis of Partial Differential Equations, La Quinta, CA, December 11–14, 2019 (conference co-chair).
8. Third International Conference on Numerical Methods for Shallow Water Equations and Related Models, Southern University of Science and Technology (SUSTech), Shenzhen, China, November 2–4, 2019.
9. Minisymposium on Multiscale and Stochastic Numerical Methods for Hyperbolic Conservation Laws, the 9th International Congress on Industrial and Applied Mathematics (ICIAM), Valencia, Spain, July 15–19, 2019.
10. International Conference on Advances in Applied Mathematics in Memoriam of Professor Saul Abarbanel, Tel Aviv University, Israel, December 18–20, 2018.
11. Second International Conference on Numerical Methods for Shallow Water Equations and Related Models, Southern University of Science and Technology (SUSTech), Shenzhen, China, December 7–10, 2018.
12. Conference on Multiscale Computations for Kinetic and Related Problems, NC State University, November 7–10, 2018.
13. Conference on Advances in PDEs: Theory, Computation and Application to CFD, Institute for Computational and Experimental Research in Mathematics (ICERM), Providence, RI, August 20–24, 2018.
14. SIAM Southeastern Atlantic Section (SIAM-SEAS) Conference, Chapel Hill, NC, March 9–11, 2018.
15. First International Conference on Numerical Methods for Shallow Water Equations and Related Models, Southern University of Science and Technology (SUSTech), Shenzhen, China, December 2–4, 2017.
16. Conference on Selected Topics in Transport Phenomena: Deterministic and Probabilistic Aspects, Center for Scientific Computation and Mathematical Modeling (CSCAMM), University of Maryland, April 18–22, 2017.
17. Young Researchers Workshop: Stochastic and Deterministic Methods in Kinetic Theory, Duke University, November 28–December 2, 2016.
18. Minisymposium on Uncertainty Quantification for Hyperbolic and Kinetic Equations, SIAM Conference on Analysis of Partial Differential Equations, Scottsdale, AZ, December 7–10, 2015.
19. Conference on Collective Dynamics in Biological and Social Systems, Duke University, November 19–22, 2015.
20. Minisymposium on Numerical Analysis, First Joint International Meeting of the Israel Mathematical Union and the Mexican Mathematical Society, Oaxaca, Mexico, September 7–11, 2015.
21. Minisymposium on Recent Developments in Modeling and Numerical Simulations of Geophysical Flows, the 8th International Congress on Industrial and Applied Mathematics (ICIAM), Beijing, China, August 10–14, 2015.
22. Conference on Asymptotic Preserving and Multiscale Methods for Kinetic and Hyperbolic Problems, University of Wisconsin, Madison, May 4–8, 2015.



23. Minisymposium on Mathematical Methods in Biological Systems, The 5th International Conference on Scientific Computing and Partial Differential Equations, Hong Kong, 8–12 December, 2014.
24. SIAM Conference on Nonlinear Waves and Coherent Structures, University of Cambridge, Cambridge, UK, August 11–14, 2014.
25. Conference on Collective Behavior: Macroscopic Versus Kinetic Descriptions, Imperial College, London, UK, May 19–23, 2014.
26. Conference on Modern Perspectives in Applied Mathematics: Theory and Numerics of PDEs, Washington, DC, April 28–May 2, 2014.
27. Workshop on Asymptotic-Preserving Methods for Kinetic Equations, NC State University, February 3–6, 2014.
28. Minisymposium on Asymptotically Preserving Numerical Methods for Time-Dependent PDEs, SIAM Conference on Analysis of PDEs, Orlando, FL, December 7–10, 2013.
29. Member of the International Advisory Committee of 29th International Symposium on Shock Waves, University of Wisconsin-Madison, July 14–19, 2013.
30. Conference on Transport Models for Collective Dynamics in Biological Systems, NC State University, January 15–19, 2013.
31. Minisymposium on Numerical Methods for Shallow Water Equations and Related Models, the 7th International Congress on Industrial and Applied Mathematics (ICIAM), Vancouver, Canada, July 18–22, 2011.
32. Member of the Scientific Committee of 28th International Symposium on Shock Waves, University of Manchester, UK, July 17–22, 2011.
33. Workshop on Pedestrian Traffic Flows, Statistical and Applied Mathematical Sciences Institute (SAMSI), February 14–16, 2011.
34. Special Session in memory of Prof. David Gottlieb, the 8th International Conference on Spectral and High-Order Methods, Trondheim, Norway, June 22–26, 2009.
35. Minisymposium on Numerical Solution of PDEs and Applications, AMS Southeastern Regional Meeting, Raleigh, NC, April 4–5, 2009.
36. Minisymposium on Numerical Methods for Multicomponent Flows, ICIAM, Zürich, July 16–20, 2007.
37. Minisymposium on Numerical Methods for Multicomponent Flows, The 2nd International Conference on Scientific Computing and Partial Differential Equations & The First East Asia SIAM Symposium, Hong Kong, December 12–16, 2005.
38. Minisymposium on Computational Aspects of Transport Phenomena, SIAM Annual Meeting, New Orleans, July 11–15, 2005.

#### INVITED CONFERENCE, COLLOQUIUM AND SEMINAR TALKS

1. Workshop on Recent Advances in Numerical Methods for Hyperbolic Conservation Laws, Shenzhen International Center of Mathematics, SUSTech, China, December 9–15, 2023.
2. Department of Mathematics, University of Mainz, Germany, November 2023.
3. Department of Mathematics, University of North Carolina, Chapel Hill, September 2023.

4. The European Conference on Numerical Mathematics and Advanced Applications (ENUMATH), Lisbon, September 4–8, 2023.
5. The 10th International Congress on Industrial and Applied Mathematics, Waseda University, Tokyo, Japan, August 20–25, 2023.
6. International Conference on Spectral and High Order Methods, Yonsei University, Seoul, South Korea, August 14–18, 2023.
7. Conference on Numerical Methods for Hyperbolic Problems (NumHyp23), Bordeaux, France, June 26–30, 2023 (**plenary speaker**).
8. 2nd UNC Greensboro PDE Conference, University of North Carolina, Greensboro, June 9–11, 2023 (**keynote speaker**).
9. Department of Mathematics, Sapienza University of Rome, Rome, Italy, March 2023.
10. Department of Mathematics, University of California, Los Angeles, March 2023.
11. Workshop on Physical Applications, Isaac Newton Institute for Mathematical Sciences, Cambridge, UK, December 4–12, 2022.
12. Conference on Essentially Hyperbolic Problems: Unconventional Numerics, and Applications, Monte Verita, Switzerland, October 9–14, 2022.
13. Workshop on Forward and Inverse Kinetic Theory and Related Topics, University of Wisconsin, Madison, September 19–20, 2022.
14. 30th Birthday of *Acta Numerica*, Banach Center, Będlewo, Poland, 26 June–02 July 2022.
15. XVIII International Conference on Hyperbolic Problems Theory, Numerics, Applications, Málaga, Spain, June 20–24, 2022.
16. Workshop on Uncertainty Quantification in Kinetic and Transport Equations and in High-Frequency Wave Propagation, Erwin Schrödinger International Institute for Mathematics and Physics, Vienna, Austria, June 13–17, 2022.
17. Workshop on Frontiers in Numerical Analysis of Kinetic Equations, Isaac Newton for Mathematical Sciences, Cambridge, UK, May 23–27, 2022.
18. Workshop on New Trends in Numerical Methods for Hyperbolic Conservation Laws, Purdue University, May 9–10, 2022.
19. The 12th IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, Athens, GA, March 30–April 1, 2022 (**keynote speaker**).
20. Department of Mathematics, Department of Applied Mathematics, University of Waterloo, Canada, March 2022.
21. Department of Mathematics, Würzburg University, Germany, February 2022.
22. Department of Mathematics, University of California, Berkeley, February 2022.
23. Department of Mathematics, University of South Carolina, October 2021.
24. International Conference on Numerical Methods for Hyperbolic Problems (NumHyp), Trento, Italy, July 26–30, 2021.
25. International Conference on Spectral and High Order Methods (ICOSAHOM), Vienna, Austria, July 12–16, 2021.
26. Workshop on New Horizons in Dispersive Hydrodynamics, Isaac Newton Institute for Mathematical Sciences, Cambridge, UK, virtually, June 21–July 2, 2021.

27. SIAM Conference on Mathematical & Computational Issues in the Geosciences, virtually, June 21–24, 2021.
28. Conference on Advances and Challenges in Hyperbolic Conservation Laws, , Institute for Computational and Experimental Research in Mathematics (ICERM), Brown University, May 17–21, 2021.
29. Workshop on Hyperbolic Balance Laws: Modeling, Analysis, and Numerics, Oberwolfach Research Institute for Mathematics, Germany, March 1–5, 2021.
30. International Conference on Recent Progresses in Applied and Computational PDEs, December 17–20, 2020.
31. SIAM Conference on Analysis of Partial Differential Equations, La Quinta, CA, December 11–14, 2019.
32. Department of Mathematics, University of Mainz, Germany, November 2019.
33. Third International Conference on Numerical Methods for Shallow Water Equations and Related Models, Southern University of Science and Technology (SUSTech), Shenzhen, China, November 2–4, 2019.
34. The 39th Southeast-Atlantic Regional Conference on Differential Equations, Embry-Riddle Aeronautical University, Daytona Beach, FL, October 26–27, 2019 (**plenary speaker**).
35. Research in Weekend Workshop on Kinetic Dynamics, Transport, Networks and Applications, Richmond, VA, October 10–13, 2019.
36. Department of Mathematics, Ohio State University, Columbus, OH, September 2019.
37. The 9th International Congress on Industrial and Applied Mathematics (ICIAM), Valencia, Spain, July 15–19, 2019.
38. Conference on Numerical Methods for Hyperbolic Problems, Instituto de Estudios Portuarios, Malaga, Spain, June 17–21, 2019.
39. Workshop on Hyperbolic Techniques in Modelling, Analysis and Numerics, Oberwolfach Research Institute for Mathematics, Germany, May 20–25, 2019.
40. International Conference Advances in Applied Mathematics in Memoriam of Professor Saul Abarbanel, Tel Aviv University, Israel, December 18–20, 2018.
41. Second International Conference on Numerical Methods for Shallow Water Equations and Related Models, Southern University of Science and Technology (SUSTech), Shenzhen, China, December 7–10, 2018.
42. Conference on Balance Laws in Geophysics, Fluid Mechanics and Biology, LE STUDIUM Loire Valley Institute for Advanced Studies, Orleans, France, November 19–21, 2018.
43. Workshop on Celebrating 75 Years of Mathematics of Computation, Institute for Computational and Experimental Research in Mathematics (ICERM), Providence, RI, November 1–3, 2018.
44. Conference on Advances in PDEs: Theory, Computation and Application to CFD, Institute for Computational and Experimental Research in Mathematics (ICERM), Providence, RI, August 20–24, 2018.
45. International Conference on Spectral and High Order Methods, Imperial College, London, UK, July 9–13, 2018.
46. XVII International Conference on Hyperbolic Problems Theory, Numerics, Applications, University Park, PA, June 25–29, 2018 (**plenary speaker**).
47. Workshop on Multi-Scale Geometric Numerical Methods, The Henri Lebesgue Center, Rennes, France, June 12–15, 2018.
48. Conference on Numerical Aspects of Hyperbolic Balance Laws and Related Problems, University of Ferrara, Italy, April 18–20, 2018.
49. Department of Mathematics, Imperial College, London, March 2018.

50. International Conference on Numerical Methods for Shallow Water Equations and Related Models, Southern University of Science and Technology (SUSTech), Shenzhen, China, December 2–4, 2017.
51. Workshop on Pedestrian Dynamics: Modeling, Validation and Calibration, Institute for Computational and Experimental Research in Mathematics (ICERM), Brown University, August 23–25, 2017.
52. Department of Mathematics, South University of Science and Technology of China, July 2017.
53. International Conference on Numerical Simulation for Multimaterial and Multiphysics Flows, Beijing, China, July 3–7, 2017.
54. Department of Mathematics, University of Mainz, Germany, June 2017.
55. Conference on Finite Volumes for Complex Applications VIII, Lille, France, June 12–16, 2017 (**plenary speaker**).
56. Conference Numerical Methods for Hyperbolic Problems, Monte Verita, Switzerland, May 28–June 2, 2017.
57. Department of Mathematics, Huazhong University of Science and Technology, China, April 2017.
58. Department of Mathematics, Wuhan University, China, April 2017.
59. Conference on Selected Topics in Transport Phenomena: Deterministic and Probabilistic Aspects, Center for Scientific Computation and Mathematical Modeling (CSCAMM), University of Maryland, April 18–22, 2017.
60. AMS Sectional Meetings, College of Charleston, Charleston, March 10–12, 2017 (**plenary speaker**).
61. SIAM Conference on Computational Science and Engineering, Atlanta, GA, February 28–March 3, 2017.
62. Department of Mathematics, South University of Science and Technology of China, February 2017.
63. Department of Mathematics, University of Wisconsin, Madison, February 2017.
64. Conference on Transport Phenomena in Collective Dynamics: From Micro to Social Hydrodynamics, ETH-Zürich, November 1–4, 2016.
65. Workshop on New Trends in Quantum and Classical Kinetic Equations and Related PDEs, University of Wisconsin, Madison, October 6–8, 2016.
66. SIAM Conference on Mathematics of Planet Earth, Philadelphia, PA, September 30–October 2, 2016.
67. Mathematics Department, Tulane University, New Orleans, LA, September 2016.
68. XVI International Conference on Hyperbolic Problems Theory, Numerics, Applications, Aachen, Germany, August 1–5, 2016.
69. Workshop on Hyperbolic Techniques in Modelling, Analysis and Numerics, Oberwolfach Research Institute for Mathematics, Germany, June 19–25, 2016.
70. Institute of Applied Analysis and Numerical Simulation, University of Stuttgart, Germany, June 2016.
71. Department of Civil Engineering, University of Ottawa, Canada, May 2016.
72. School of Mathematical Sciences, Tel-Aviv University, Israel, May 2016.
73. School of Mathematical Sciences, Nanjing Normal University, China, March 2016.
74. Department of Mathematics, Imperial College, London, February 2016.
75. SIAM Conference on Analysis of Partial Differential Equations, Scottsdale, AZ, December 7–10, 2015.
76. Conference “Women in Applied Maths & Soft Matter Physics”, Mainz, Germany, October 26–28, 2015.
77. First Joint International Meeting of the Israel Mathematical Union and the Mexican Mathematical Society, Oaxaca, Mexico, September 7–11, 2015.

78. Workshop on Multiscale Numerical Methods for Differential Equations, Lebesgue Center of Mathematics, Rennes, France, August 25–27, 2015.
79. The 8th International Congress on Industrial and Applied Mathematics (ICIAM), Beijing, China, August 10–14, 2015.
80. Workshop and Summer School on Kinetic Theory and Gas Dynamics, Shanghai, China, August 4–7, 2015.
81. Numerical Approximations of Hyperbolic Systems with Source Terms and Applications, Cortona, Italy, June 12–20, 2015.
82. Conference on Asymptotic Preserving and Multiscale Methods for Kinetic and Hyperbolic Problems, University of Wisconsin, Madison, May 4–8, 2015.
83. Department of Mathematics, George Washington University, February 2015.
84. Department of Civil Engineering, University of Ottawa, Canada, February 2015.
85. Department of Mathematics, Purdue University, January 2015.
86. The 9th International Conference on Computational Physics, Singapore, 7–11 January, 2015.
87. The 5th International Conference on Scientific Computing and Partial Differential Equations, Hong Kong, 8–12 December, 2014.
88. Department of Mathematics, University of Wisconsin, Madison, November 2014.
89. SIAM Conference on Nonlinear Waves and Coherent Structures, University of Cambridge, Cambridge, UK, August 11–14, 2014.
90. Department of Mathematics, University of Mainz, Germany, July 2014.
91. Second Joint International Meeting of the Israeli Mathematical Union (IMU) and the American Mathematical Society (AMS), Tel-Aviv, Israel, June 16–19, 2014.
92. The 18th European Conference on Mathematics for Industry, Taormina, Italy, June 9–13, 2014.
93. Department of Mathematics, University of California, Irvine, April 2014.
94. SIAM Conference on Analysis of PDEs, Orlando, FL, December 7–10, 2013.
95. Center for Scientific Computation and Mathematical Modeling (CSCAMM), University of Maryland, November 2013.
96. AMS Fall Eastern Sectional Meeting, Philadelphia, PA, October 12–13, 2013.
97. Numerical Approximations of Hyperbolic Systems with Source Terms and Applications, Aachen, Germany, September 23–27, 2013.
98. International Conference on Difference Schemes and Applications, Moscow, Russia, May 27–30, 2013.
99. Laboratory for Mathematical Modeling of Nonlinear Processes in Gas Media, Moscow Institute of Physics and Technology, Russia, May 2013.
100. Department of Mathematics, Imperial College, London, April 2013.
101. Clifford Lectures on Numerical Methods for Convection Dominated Partial Differential Equations, Tulane University, New Orleans, LA, March 13–16, 2013.
102. Conference on Kinetic Theory for the Emergence of Complex Behavior in Social and Economic Systems, Tempe, AZ, February 22–24, 2013.
103. Department of Mathematics, University of Houston, January 2013.
104. Department of Mathematics, Texas A&M University, January 2013.
105. Institut de Mathématiques de Toulouse, Université Paul Sabatier, France, December 2012.

106. Conference on Scientific Computing, Podbanske, Slovakia, September 9-14, 2012.
107. The Second International Conference on Scientific Computing, Nanjing, China, May 22-25, 2012.
108. Departament de Matemàtiques, Universitat Autònoma de Barcelona, Spain, May 2012.
109. Kinetic Description of Emerging Challenges in Multiscale Problems of Natural Sciences, Organizational Meeting, Center for Scientific Computation and Mathematical Modeling (CSCAMM), University of Maryland, March 8-10, 2012.
110. Workshop on Recent Developments in the Numerics of Nonlinear Hyperbolic Conservation Laws and their Use in Science and Engineering, Mathematisches Forschungsinstitut Oberwolfach, Germany, January 15-21, 2012.
111. Workshop on Efficient Mesh Adaptation Methods for Evolution Problems: Theory and Application, Wolfgang Pauli Institute, Vienna, Austria, December 14-17, 2011.
112. Department of Mathematics, University of Mainz, Germany, December 2011.
113. Department of Mathematics, Imperial College, London, October 2011.
114. Workshop on Vlasov Models in Kinetic Theory, Institute for Computational and Experimental Research in Mathematics (ICERM), Brown University, September 19-23, 2011.
115. The 7th International Congress on Industrial and Applied Mathematics (ICIAM), Vancouver, Canada, July 18-22, 2011.
116. International Conference in Honor of Saul Abarbanel's 80th Birthday, Tel-Aviv University, Israel, June 28-29, 2011.
117. International Conference "Differential Equations and Related Topics", Lomonosov Moscow State University, Russia, May 29-June 4, 2011.
118. Institut de Mathématiques de Toulouse, Université Paul Sabatier, France, April 2011.
119. Department of Mathematics, NC State University, March 2011.
120. Department of Mathematics, University of Maryland, March 2011.
121. Department of Mathematics, Temple University, March 2011.
122. Institut de Mathématiques de Toulouse, Université Paul Sabatier, France, November 2010.
123. Department of Mathematics, University of California, Berkeley, November 2010.
124. Workshop on Modeling and Computations of Shallow-Water Coastal Flows, Center for Scientific Computation and Mathematical Modeling (CSCAMM), University of Maryland, October 18-20, 2010.
125. Program on Partial Differential Equations in Kinetic Theories, Isaac Newton Institute for Mathematical Sciences, Cambridge, UK, October 2010.
126. SIAM Annual Meeting, Pittsburgh, PA, July 12-16, 2010.
127. International Conference on Computational and Mathematical Methods in Science and Engineering (CMMSE 2010), University of Wisconsin-Madison, May 24-26, 2010.
128. Workshop on Transport and Mixing in Complex and Turbulent Flows, Institute for Mathematics and Its Applications, University of Minnesota, April 12-16, 2010.
129. Mathematics Department, Tulane University, New Orleans, LA, March 2010.
130. Center for Scientific Computation and Mathematical Modeling (CSCAMM), University of Maryland, March 2010.
131. Center for Imaging Science, Johns Hopkins University, February 2010.

132. First International Workshop on Mathematical Methods in Systems Biology, Tel-Aviv University, Israel, January 4–7, 2010.
133. Department of Mathematical and Computer Sciences, University of Catania, Italy, December 2009.
134. The 8th International Conference on Spectral and High-Order Methods, Trondheim, Norway, June 22–26, 2009.
135. Division of Engineering and Applied Science, California Institute of Technology, April 2009.
136. The 6th IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, Athens, GA, March 23–26, 2009.
137. Department of Applied Mathematics and Theoretical Physics, Centre for Mathematical Sciences, University of Cambridge, UK, February 2009.
138. Center for Applied Mathematics, Cornell University, December 2008.
139. Cha-Cha Days Workshop, University of North Carolina, Chapel Hill, October 31–November 2, 2008.
140. Department of Mathematics and Statistics, University of North Carolina, Charlotte, September 2008.
141. 12th International Conference on Hyperbolic Problems Theory, Numerics, Applications, College Park, MD, June 9–13, 2008.
142. 7th AIMS International Conference on Dynamical Systems, Differential Equations and Applications, Arlington, TX, May 18–21, 2008.
143. Division of Engineering and Applied Science, California Institute of Technology, February 2008.
144. Department of Mathematics, University of Maryland, February 2008.
145. Center for Scientific Computation and Mathematical Modeling (CSCAMM), University of Maryland, February 2008.
146. Division of Applied Mathematics, Brown University, January 2008.
147. Statistical and Applied Mathematical Sciences Institute (SAMSI), Program on Random Media, Interface Problems Workshop, Research Triangle Park, NC, November 2007.
148. Mathematics Department, Tulane University, New Orleans, LA, October 2007.
149. 6th International Congress on Industrial and Applied Mathematics, ICIAM 2007, Zürich, Switzerland, July 16–20, 2007.
150. Numerical Methods for Degenerate Elliptic Equations and Applications, Banff International Research Station for Mathematical Innovation and Discovery (BIRS), Banff, Canada, December 9–14, 2006.
151. Mathematics Department, Tulane University, New Orleans, LA, November 2006.
152. European Conference on Computational Fluid Dynamics, Egmond aan Zee, Netherlands, September 2006.
153. School of Mathematical Sciences, Tel-Aviv University, Israel, June 2006.
154. Mathematics Department, Tulane University, New Orleans, LA, June 2006.
155. Multiscale Modeling of Materials: Mathematics and Computation, Tacoma, WA, May 25–30, 2006.
156. Nonlinear Diffusions: Entropies, Asymptotic Behavior and Applications, Banff International Research Station for Mathematical Innovation and Discovery (BIRS), Banff, Canada, April 15–20, 2006.
157. Mathematics Department, Tulane University, New Orleans, LA, March, 2006.
158. The 2nd International Conference on Scientific Computing and Partial Differential Equations & The First East Asia SIAM Symposium, Hong Kong, December 12–16, 2005.

159. Elizabeth C. Crosby Speaker Series, Department of Mathematics, University of Michigan, Ann Arbor, November 2005.
160. SIAM Annual Meeting, New Orleans, LA, July 11–15, 2005.
161. International Conference on Scientific Computing, Nanjing, China, June, 2005.
162. Workshop on Stiff Sources and Numerical Methods for Conservation Laws, The American Institute of Mathematics (AIM), Palo Alto, CA, April 4–8, 2005.
163. Division of Applied Mathematics, Brown University, February 2005.
164. Department of Mathematics, University of North Carolina, Chapel Hill, October 2004.
165. Mathematics Department, Tulane University, New Orleans, LA, October 2004.
166. Schemes for Multidimensional Wave Structures in Hyperbolic Systems, Hamburg University of Technology, Germany, March 1–4, 2004.
167. Center for Scientific Computation and Mathematical Modeling (CSCAMM), University of Maryland, November 2003.
168. Department of Mathematics, Duke University, November 2003.
169. Division of Applied Mathematics, Brown University, September 2003.
170. Division of Engineering and Applied Science, California Institute of Technology, July 2003.
171. Department of Electrical Engineering, NC State University, January 2003.
172. Mathematics Department, Tulane University, New Orleans, LA, October 2002.
173. Department of Mathematics, University of California, Berkeley, March 2002.
174. Department of Mathematics, University of Houston, March 2002.
175. Department of Mathematics, University of North Carolina, Chapel Hill, February 2002.
176. Department of Mathematics, NC State University, February 2002.
177. Department of Mathematics, University of Delaware, February 2002.
178. Department of Mathematics, University of Kentucky, January 2002.
179. Department of Mathematics, Texas A&M University, January 2002.
180. Department of Mathematics, University of Massachusetts, Amherst, December 2001.
181. Mathematics Department, Tulane University, New Orleans, LA, October 2001.
182. Department of Mathematics, University of Michigan, Ann Arbor, October 2000.
183. Division of Applied Mathematics, Brown University, September 1999.

## LIST OF PUBLICATIONS

All the papers can be downloaded from

<https://chertock.wordpress.ncsu.edu/publications/>

1. A. Chertock, Y. Karamzin, V. Trofimov, *On a numerical algorithm for nonlinear differential equations describing some processes in photoreceivers*, Mat. Model. **3** (1991), pp. 95–103 (in Russian).
2. S. Abarbanel, A. Chertock, *Strict stability of high-order compact implicit finite-difference schemes - the role of boundary conditions for hyperbolic PDEs. Part I*, J. Comput. Phys. **160** (2000), pp. 42–66.



3. S. Abarbanel, A. Chertock, A. Yefet, *Strict stability of high-order compact implicit finite-difference schemes - the role of boundary conditions for hyperbolic PDEs. Part II*, J. Comput. Phys. **160** (2000), pp. 67–87.
4. G. I. Barenblatt, M. Bertsch, A. E. Chertock, V. M. Prostokishin, *Self-similar intermediate asymptotics for a degenerate parabolic filtration-absorption equation*, Proc. Natl. Acad. Sci. USA **97** (2000), pp. 9844–9848.
5. A. Chertock, D. Levy, *Particle methods for dispersive equations*, J. Comput. Phys. **171** (2001), pp. 708–730.
6. A. Chertock, *On the stability of a class of self-similar solutions to the filtration-absorption equation*, European J. Appl. Math. **13** (2002), pp. 179–194.
7. A. Chertock, D. Levy, *A particle method for the KdV equation*, J. Sci. Comput. **17** (2002), pp. 491–499.
8. A. Chertock, A. Kurganov, P. Rosenau, *Formation of discontinuities in flux-saturated degenerate parabolic equations*, Nonlinearity, **16** (2003), pp. 1875–1898.
9. A. Chertock, A. Kurganov, *On a hybrid finite-volume particle method*, M2AN Math. Model. Numer. Anal. **38** (2004), pp. 1071–1091.
10. A. Chertock, D. Levy, *On wavelet-based numerical homogenization*, Multiscale Model. Simul. **3** (2004), pp. 65–88.
11. A. Chertock, A. Kurganov, *Conservative locally moving mesh method for multifluid flows*, Finite Volumes for Complex Applications IV (2005), pp. 273–284.
12. A. Chertock, A. Kurganov, G. Petrova, *Fast explicit operator splitting method. Application to the polymer system*, Finite Volumes for Complex Applications IV (2005), pp. 63–72.
13. A. Chertock, A. Kurganov, P. Rosenau, *On degenerate saturated-diffusion equations with convection*, Nonlinearity, **18** (2005), pp. 609–630.
14. A. Chertock, A. Kurganov, G. Petrova, *Finite-volume-particle methods for models of transport of pollutant in shallow water*, J. Sci. Comput. **27** (2006), pp. 189–199.
15. A. Chertock, A. Kurganov, *On a practical implementation of particle methods*, Appl. Numer. Math. **56** (2006), pp. 1418–1431.
16. A. Chertock, A. Kurganov, Yu. Rykov, *A new sticky particle method for pressureless gas dynamics*, SIAM J. Numer. Anal. **45** (2007), pp. 2408–2441.
17. A. Chertock, E. Kashdan, A. Kurganov, *Propagation of diffusing pollutant by a hybrid Eulerian-Lagrangian method*, Hyperbolic Problems: Theory, Numerics, Applications (Lyon 2006), pp. 371–380, Springer, 2008.
18. A. Chertock, A. Kurganov, *A simple Eulerian finite-volume method for compressible fluids in domains with moving boundaries*, Commun. Math. Sci. **6** (2008), pp. 531–556.
19. A. Chertock, D. Gottlieb, A. Solomonoff, *Modified optimal prediction and its application to a particle-method problem*, J. Sci. Comput. **37** (2008), pp. 189–201.
20. A. Chertock, S. Karni, A. Kurganov, *Interface tracking method for compressible multifluids*, M2AN Math. Model. Numer. Anal. **42** (2008), pp. 991–1019.
21. A. Chertock, A. Kurganov, *A second-order positivity preserving central-upwind scheme for chemotaxis and haptotaxis models*, Numer. Math. **111** (2008), pp. 169–205.
22. A. Chertock, A. Kurganov, *Computing multivalued solutions of pressureless gas dynamics by deterministic particle methods*, Commun. Comput. Phys. **5** (2009), pp. 565–581.
23. A. Chertock, A. Kurganov, G. Petrova, *Fast explicit operator splitting method for convection-diffusion equations*, Internat. J. Numer. Methods Fluids **59** (2009), pp. 309–332.
24. A. Chertock and A. Kurganov, *On splitting-based numerical methods for convection-diffusion equations*, in Numerical Methods for Balance Laws, Quad. Mat., **24** (2010), p. 303.

25. A. Chertock, C. Doering, E. Kashdan and A. Kurganov, *A fast explicit operator splitting method for passive scalar advection*, J. Sci. Comput. **45** (2010), pp. 200–214.
26. A. Chertock, C. I. Christov and A. Kurganov, *Central-upwind schemes for the Boussinesq paradigm equations*, in Computational Science and High Performance Computing IV, Notes Numer. Fluid Mech. Multidiscip. Des., Springer, **115** (2011), pp. 267–281.
27. A. Chertock, P. Du Toit and J. E. Marsden, *Integration of the EPDiff equation by particle methods*, M2AN Math. Model. Numer. Anal. **46** (2012), pp. 515–534.
28. A. Chertock, A. Kurganov, X. Wang and Y. Wu, *On a chemotaxis model with saturated chemotactic flux*, Kinet. Relat. Models **5** (2012), pp. 51–95.
29. A. Chertock, J.-G. Liu and T. Pendleton, *Convergence analysis of the particle method for the Camassa-Holm equation*, Proceedings of the 13th International Conference on “Hyperbolic Problems: Theory, Numerics and Applications” Ser. Contemp. Appl. Math. CAM **2** (2012), pp. 365–373.
30. A. Chertock, K. Fellner, A. Kurganov, A. Lorz and P. Markowich, *Sinking, merging and stationary plumes in a coupled chemotaxis-fluid model: a high-resolution numerical approach*, J. Fluid Mech. **694** (2012), pp. 155–190.
31. A. Chertock, J.-G. Liu and T. Pendleton, *Convergence of a particle method and global weak solutions for a family of evolutionary PDEs*, SIAM J. Numer. Anal. **50** (2012), pp. 1–21.
32. A. Chertock, A. Kurganov, Z. Qu and T. Wu, *Three-layer approximation of two-layer shallow water equations*, Math. Model. Anal. **18** (2013), pp. 675–693.
33. A. Chertock, A. Kurganov, A. Polizzi, and I. Timofeyev, *Pedestrian flow models with slowdown interactions*, Math. Models Methods Appl. Sci. **24** (2014), pp. 249–275.
34. A. Chertock, A. Kurganov and Y. Liu, *Central-upwind schemes for the system of shallow water equations with horizontal temperature gradients*, Numer. Math. **127** (2014), pp. 595–639.
35. A. Chertock, M. Herty and A. Kurganov, *An Eulerian-Lagrangian method for optimization problems governed by multidimensional nonlinear hyperbolic PDEs*, Comput. Optim. Appl. **59**, (2014), pp. 689–724.
36. M. Castro Diaz, Y. Cheng, A. Chertock, and A. Kurganov, *Solving two-mode shallow water equations using finite volume methods*, Commun. Comput. Phys. **16** (2014), pp. 1323–1354.
37. J. A. Carrillo, A. Chertock, and Y. Huang, *A finite-volume method for nonlinear nonlocal equations with a gradient flow structure*, Commun. Comput. Phys. **17** (2015), pp. 233–258.
38. A. Chertock, J.-G. Liu and T. Pendleton, *Elastic collisions among peakon solutions for the Camassa-Holm equation*, Appl. Numer. Math. **93** (2015), pp. 30–46.
39. A. Chertock, S. Cui, A. Kurganov and T. Wu, *Steady state and sign preserving semi-implicit Runge-Kutta methods for ODEs with stiff damping term*, SIAM J. Numer. Anal. **53** (2015), pp. 2008–2029.
40. A. Chertock, S. Cui, A. Kurganov, and T. Wu, *Well-balanced positivity preserving central-upwind scheme for the shallow water system with friction terms*, Internat. J. Numer. Methods Fluids **78** (2015), pp. 355–383.
41. A. Bernstein, A. Chertock and A. Kurganov, *Central-upwind scheme for shallow water equations with discontinuous bottom topography*, Proceedings of the XV International Conference on Hyperbolic Problems: Theory, Numerics and Applications, Bull. Braz. Math. Soc. (N.S.), Springer, **47** (2016), pp. 91–103.
42. A. Chertock, P. Degond and J. Neusser, *An asymptotic-preserving method for a relaxation of the Navier-Stokes-Korteweg equations*, J. Comput. Phys. **335** (2017), pp. 387–403.
43. A. Chertock, *A practical guide to deterministic particle methods*, Handb. Numer. Anal. **18**, 1st Edition, Elsevier, (2017), pp. 177–202.
44. A. Chertock, S. Cui and A. Kurganov, *Hybrid finite-volume-particle methods for dusty gas flows*, SMAI J. Comput. Math. **3** (2017), pp. 139–180.

45. Y. Cheng, A. Chertock, and A. Kurganov, *A simple finite-volume method on a cartesian mesh for pedestrian flows with obstacles*, Finite Volumes for Complex Applications, VIII—methods and theoretical aspects, pp. 43–55, Springer Proc. Math. Stat., 199, 2017.
46. A. Chertock, A. Coco, A. Kurganov and G. Russo, *A Second-order finite-difference method for compressible fluids in domains with moving boundaries*, Commun. Comput. Phys. **23** (2018), pp. 230–263.
47. A. Chertock, Y. Epshteyn, H. Hu and A. Kurganov, *High-order positivity-preserving hybrid finite-volume-finite-difference methods for chemotaxis systems*, Adv. Comput. Math. **44** (2018), pp. 327–350.
48. A. Chertock, M. Dudzinski, A. Kurganov and M. Lukáčová-Medvidová, *Well-balanced schemes for the shallow water equations with Coriolis forces*, Numer. Math. **138** (2018), pp. 939–973.
49. A. Chertock, S. Cui, A. Kurganov, Ş. N. Özcan and E. Tadmor, *Well-balanced schemes for the Euler equations with gravitation: Conservative formulation using global fluxes*, J. Comput. Phys. **358** (2018), pp. 36–52.
50. A. Chertock, C. Tan and B. Yan, *An asymptotic preserving scheme for kinetic models with singular limit*, Kinet. Relat. Models **11** (2018), pp. 735–756.
51. A. Chertock, M. Herty, and Ş. N. Özcan, *Well-balanced central-upwind schemes for  $2 \times 2$  systems of balance laws*, in Theory, Numerics and Applications of Hyperbolic Problems I, Springer Proc. Math. Stat., Springer, **236** (2018), pp. 345–361.
52. A. Chertock, A. Kurganov, M. Lukáčová-Medvidová, and Ş. N. Özcan, *An asymptotic preserving scheme for kinetic chemotaxis models in two space dimensions*, Kinet. Relat. Models **12** (2019), pp. 195–216.
53. X. Liu, A. Chertock, and A. Kurganov, *An asymptotic preserving scheme for the two-dimensional shallow water equations with Coriolis forces*, J. Comput. Phys. **391** (2019), pp. 259–279.
54. A. Chertock, A. Kurganov, M. Ricchiuto and T. Wu, *Adaptive moving mesh upwind scheme for the two-species chemotaxis model*, Comput. Math. Appl. **77** (2019), pp. 3172–3185.
55. A. Chertock and A. Kurganov, *High-resolution positivity and asymptotic preserving numerical methods for chemotaxis and related models*, Active Particles, Volume 2. Model. Simul. Sci. Eng. Technol., Springer International Publishing, Birkhäuser (2019), pp. 109–148.
56. Y. Cheng, A. Chertock, M. Herty, A. Kurganov, and T. Wu, *A new approach for designing moving-water equilibria preserving schemes for the shallow water equations*, J. Sci. Comput. **80** (2019), pp. 538–554.
57. A. Chertock, P. Degond, S. Hecht, and J.-P. Vincent, *Incompressible limit of a continuum model of tissue growth with segregation for two cell populations*, Math. Biosci. Eng. **16** (2019), pp. 5804–5835.
58. A. Chertock, A. Kurganov, M. Lukáčová-Medvidová, P. Spichtinger, and B. Wiebe, *Stochastic Galerkin method for cloud simulation*, Math. Clim. Weather Forecast. **5** (2019), pp. 65–106.
59. A. Chertock, A. Ditkowski, A. Gelb, S. Gottlieb, S. Tsynkov, *Preface to the special issue in memory of Professor Saul Abarbanel* [Editorial], J. Sci. Comput. **81** (2019), pp. 1119–1123.
60. X. Liu, A. Chertock, A. Kurganov, and K. Wolfkill, *One-dimensional/two-dimensional coupling approach with quadrilateral confluence region for modeling river systems*, J. Sci. Comput. **81** (2019), pp. 1297–1328.
61. A. Chertock, A. Kurganov, and Y. Liu, *Finite-volume-particle methods for the two-component Camassa-Holm system*, Commun. Comput. Phys. **27** (2020), pp. 480–502.
62. A. Chertock, A. Kurganov, J. Miller, and J. Yan, *Central-upwind scheme for a non-hydrostatic Saint-Venant system*, Proceedings of the XVII International Conference on Hyperbolic Problems: Theory, Numerics and Applications, American Institute of Mathematical Sciences, **10** (2020), pp. 25–42.
63. A. Chertock, A. Kurganov, and T. Wu, *Operator splitting based central-upwind schemes for shallow water equations with moving bottom topography*, Commun. Math. Sci. **18** (2020), pp. 2149–2168.
64. A. Chertock, S. Chu, and A. Kurganov, *Hybrid multifluid algorithms based on the path-conservative central-upwind scheme*, J. Sci. Comput. **89** (2021), no. 2, Paper No. 48, 24 pp.

65. A. Chertock, A. Kurganov, X. Liu, Y. Liu, and T. Wu, *Well-balancing via flux globalization: Applications to shallow water equations with wet/dry fronts*, J. Sci. Comput. **90** (2022), no. 1, Paper No. 9, 21 pp.
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67. A. Chertock, A. Kurganov, T. Wu and J. Yan, *Well-balanced numerical method for atmospheric flow equations with gravity*, Appl. Math. Comput. **489** (2023), Paper No. 127587, 13 pp.
68. A. Chertock, S. Chu, M. Herty, A. Kurganov and M. Lukáčová-Medvidová, *Local characteristic decomposition based central-upwind scheme*, J. Comput. Phys. **473** (2023), Paper No. 111718, 24 pp.
69. A. Chertock, A. Kurganov, M. Lukáčová-Medvidová, P. Spichtinger and B. Wiebe, *Stochastic Galerkin method for cloud simulation. Part II: A fully random Navier-Stokes-cloud model*, J. Comput. Phys., **479** (2023), Paper No. 111987, 24 pp.
70. C. Wang, A. Chertock, S. Cui, A. Kurganov, and Z. Zhang, *A diffuse-domain based numerical method for a chemotaxis-fluid model*, Math. Models Methods Appl. Sci., **33** (2023), pp. 341–375.
71. A. Chertock, S. Chu, and A. Kurganov, *Adaptive high-order A-WENO schemes based on a new local smoothness indicator*, East Asian J. Appl. Math., **13** (2023), pp. 576–609.
72. A. Chertock, C. Leonard, S. Tsynkov, and S. Utyuzhnikov, *Denoising convolution algorithms and applications to SAR signal processing*, Commun. Anal. Comput., **1** (2023), pp. 135–156.
73. A. Chertock and C. Leonard, *Simulating partial differential equations with neural networks*, Proceedings of the XVIII International Conference on Hyperbolic Problems: Theory, Numerics, Applications. (2023), accepted.
74. A. Chertock, S. Chu, and A. Kurganov, *Accurate deterministic projection methods for stiff detonation waves*, Commun. Math. Sci., (2023), to appear.
75. A. Chertock, C. Leonard and S. Tsynkov, *Finding the shape of lacunae of the wave equation using artificial neural networks*, Appl. Math. Comput., (2023), to appear, arXiv:2202.05768.
76. A. Chertock, A. Kurganov, M. Redle and K. Wu, *A new locally divergence-free path-conservative central-upwind scheme for ideal and shallow water magnetohydrodynamics*, SIAM J. Sci. Comput., (2024), accepted, arXiv:2212.02682.
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82. A. Chertock, S. Jin and A. Kurganov, *An operator splitting based stochastic Galerkin method for the one-dimensional compressible Euler equations with uncertainty*, preprint.
83. A. Chertock, S. Jin and A. Kurganov, *A well-balanced operator splitting based stochastic Galerkin method for the one-dimensional Saint-Venant system with uncertainty*, preprint.