CURRICULUM VITAE

MARKOS A. KATSOULAKIS, Professor

Department of Mathematics and Statistics, University of Massachusetts, Amherst, USA.

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Date and Place of Birth: December 15th, 1965, Athens, Greece.

Country of Citizenship: Greece

RESEARCH INTERESTS

Stochastic Analysis, Statistical Mechanics and Nonlinear Partial Differential Equations, focusing on the mathematical and computational aspects of phenomena with multiple, interrelating scales.

EDUCATION

- Ph.D in Applied Mathematics, Division of Applied Mathematics, Brown University, May 1993, (completed in May 1991).

  Dissertation Title: Boundary value problems for second order nonlinear PDEs.

  Advisor: P. E. Souganidis, University of Chicago.

- B.A. in Mathematics, National and Kapodistrian University, Athens, Greece, July 1987.

PROFESSIONAL APPOINTMENTS

1. Professor, Department of Mathematics and Statistics, University of Massachusetts, Amherst 9/03 - present.
2. Professor, Department of Applied Mathematics, University of Crete, Greece 4/08 - present (on leave).
3. Director, Center for Applied Mathematics, University of Massachusetts, Amherst 7/00 - 8/08, 9/11-present
4. Associate Professor, Department of Mathematics and Statistics, University of Massachusetts, Amherst 9/99 - 8/03.
5. Visiting Associate Professor, School of Mathematics, Georgia Institute of Technology, Fall of 01/02.
6. Assistant Professor, Department of Mathematics and Statistics, University of Massachusetts, Amherst 9/95 - 8/99.
7. Visiting Research Instructor, Department of Mathematics, Michigan State University 8/94-7/95 and 8/92-7/93.
8. Postdoctoral Fellow, Mathematical Sciences Research Institute, 1/94-6/94.

9. Postdoctoral Research Fellow, Center for the Mathematical Sciences, University of Wisconsin-Madison, 7/93-1/94.

10. Postdoctoral Research Fellow Center for Nonlinear Analysis Department of Mathematics Carnegie-Mellon University, 6/91-7/92.

PUBLICATIONS

1. Viscosity Solutions of Monotone Systems for Dirichlet problems, (with S.Koike), J. Diff. Integ. Eq. **7**, (1993), 367-382.

2. Viscosity Solutions of 2nd Order Fully Nonlinear Elliptic Equations with State Constraints, Indiana U. Math. J. **43**, (1994), 493-519.

3. A Representation Formula and Regularizing Effect for the Viscosity Solution of 2nd Order Fully Nonlinear Degenerate Parabolic Equations, Nonlinear Anal. T.M.A. **22**, (1994).

4. Interacting Particle Systems and Generalized Evolutions of Fronts (with P. E. Souganidis), Arch. Rat. Mech. Anal., **127**, (1994), 133-157.

5. Generalized motion by mean curvature with Neumann conditions and the Allen-Cahn model for phase transitions (with G. Kossioris and F. Reitich), J. Geom. Anal., **5**, (1995), 255-279.

6. Generalized motion by mean curvature as a macroscopic limit of stochastic Ising models with long range interactions and Glauber dynamics (with P. E. Souganidis), Comm. Math. Phys., **169**, (1995), 61-97.

7. Γ-Convergence, Minimizing Movements and Generalized Mean Curvature Evolution (with I. Fonseca), J. Diff. Int. Eq., **8**, (1995), 1619-1656.

8. Contractive Relaxation Systems and Interacting Particle Systems for hyperbolic conservation laws, (with A.E. Tzavaras), Compt. Rend. Acad. Science Paris I, **323**, (1996), 865-870.

9. Stochastic Ising models and anisotropic front propagation (with P.E. Souganidis), J. Stat. Phys. **87**, (1997), 63-89.

10. Contractive Relaxation Systems and the Scalar Multidimensional Conservation Law, (with A.E. Tzavaras), Comm. P.D.E. **22**, (1997), 195-233.

11. From Microscopic to Macroscopic models for Phase Transitions, Proc. RIMS Symposium on Variational Problems and Related Topics, Kyoto University, RIMS Kokyuroku Series, 1996.

12. Relaxation Approximations to Front Propagation, (with S. Jin), J. Diff. Eq. **138**, (1997), 380-387.

13. Convergence and Error Estimates of Relaxation Schemes for Multidimensional Conservation Laws (with G. Kossioris and Ch. Makridakis), Comm. P.D.E. **24**, (1999), 395-423.

14. Relaxation Schemes for Curvature-Dependent Front Propagation, (with S. Jin and Z. Xin), Comm. Pure Appl. Math. **52**, 12, (1999), 1587–1615.

15. Multiscale Analysis for Interacting Particles: Relaxation Systems and Scalar Conservation Laws (with A.E. Tzavaras), J. Stat. Phys. **96**, 3/4, (1999), 715–763.

16. From microscopic interactions to macroscopic laws of cluster growth (with D. G. Vlachos), Phys. Rev. Lett. **84**, 7, (2000), 1511-1514.

17. Relaxation limits for systems of conservation laws, satisfying a super-characteristic condition, (with S. Jin), SIAM J. Appl. Math. **61**, 1, (2000), 273-292.

18. Mesoscopic Theories for the Diffusion of Interacting Molecules, (with D. G. Vlachos), Phys. Rev. Lett. **85**, 18, (2000), 3898-3901.

19. Bridging the gap of multiple scales: From microscopic, to mesoscopic, to macroscopic models, (with P. Aghalayam, S. Raimondeau, and D. G. Vlachos), Proceedings of the "Foundations of Molecular Modeling and Simulation 2000".

20. Stochastic Curvature Flows: Asymptotic Derivation, Level Set Formulation and Numerical Experiments, (with A. T. Kho), J. Interfaces and Free Boundaries **3**, 3, (2001), 265-290.

21. Spectral Methods for Mesoscopic Models In Pattern Formation, (with D. J. Horntrop and D. G. Vlachos), J. Comp. Phys. **173**, (2001), 361-390.

22. Fokker-Planck equations for an equilibrium model of chromatin folding, (with A. T. Kho and N. Whitaker), G.A.N.G. Preprint 5.9.

23. Validation of mesoscopic theories and their application to computing concentration dependent diffusivities, (with T. Basak, R. Lam and D. G. Vlachos), J. Chem. Phys. **115**, (2001), 11278-11288.

24. Homogenization of mesoscopic theories: effective properties of model membranes, (with R. Lam and D. G. Vlachos), Amer. Inst. Chem. Eng. (AIChE) Journal, **48**, (2002), 1083-1092.

25. A novel approach to molecular modeling of transport through inorganic nanoporous membranes, (with M.A. Snyder and D. G. Vlachos), Abstr. Am. Chem Soc. (ACS) **223**, (2002), 066-FUEL Part 1.

26. Mesoscopic modeling of surface processes, (with D. G. Vlachos), "Multiscale Models for Surface Evolution and Reacting Flows", IMA Vol. Math. Appl. **136** (2003), 179-198.

27. Coarse-grained stochastic processes for lattice systems, (with A. J. Majda and D. G. Vlachos), Proc. Natl. Acad. Sci. USA **100**, (2003), 782-787.

28. Mesoscopic modeling of transport and reaction in microporous crystalline membranes, (with M.A. Snyder and D. G. Vlachos), Chem. Eng. Sci. **58**, (2003), 895-901.

29. Wave initiation through spatiotemporally structured perturbations, (with G. Ertl, I. G. Kevrekidis, X. Li, A. Papathanasiou, H.H.Rotermund and J. Wolff), Phys. Rev. Lett. **90**, 14, (2003).

30. Coarse-grained stochastic processes and Monte Carlo simulations in lattice systems, (with A. J. Majda and D. G. Vlachos), J. Comp. Phys. **186**, (2003), 250-278.

31. Coarse-grained stochastic models for tropical convection and climate, (with B. Khouider and A. J. Majda), Proc. Natl. Acad. Sci. USA **100**, (2003), 11941-11946.

32. Hierarchical kinetic Monte Carlo simulations for diffusion of interacting molecules, (with D. G. Vlachos), J. Chem. Phys. **112**, 18, (2003).

33. Multiscale couplings in prototype hybrid deterministic/stochastic systems: Part I, deterministic closures (with A. J. Majda and A. Sopasakis), Comm. Math. Sci. **2**, (2004), 255-294.

34. Spatially adaptive lattice coarse-grained Monte Carlo simulations for diffusion of interacting molecules (with A. Chaterjee and D. G. Vlachos), J. Chem. Phys. **121**, 11420 (2004).

35. Mesoscopic modeling for continuous spin lattice systems: Model problems and micromagnetics applications, (with P. Plecháč and D. Tsagkarogiannis), J. Stat. Phys., **118**, (2005).

36. Numerical assessment of theoretical error estimates in coarse-grained kinetic Monte Carlo simulations: Application to surface diffusion, (with A. Chaterjee and D. G. Vlachos), Int. J. Multiscale Comp. Eng., **3**, (2005).

37. Binomial distribution based τ-leap accelerated stochastic simulation, (with A. Chaterjee and D. G. Vlachos), J. Chem. Phys. **122**, 024112 (2005).

38. Spatially adaptive grand canonical Monte Carlo simulations, (with A. Chaterjee and D. G. Vlachos), Phys. Rev. E **71**, (2005).

39. Mathematical strategies for the coarse-graining of microscopic models, (with D. G. Vlachos), in *Handbook of Materials Modelling*, Springer, S. Yip (ed.), 1477-1490, (2005).

40. Multiscale couplings in prototype hybrid deterministic/stochastic systems: Part II: Stochastic closures (with A. J. Majda and A. Sopasakis), Comm. Math. Sci. **3**, 453 - 478, (2005).

41. A mathematical model for crystal growth by oriented aggregation of precursor metastable nanoparticles (with T. O. Drews and M. Tsapatsis), J. Phys. Chem. B **109**(50), 23879-23887 (2005).

42. Information loss in coarse-graining of stochastic particle dynamics (with J. Trashorras), J. Stat. Phys., **122** (1), 115-135 (2006).

43. Mechanistic Principles of Nanoparticle Evolution to Zeolite Crystals (with T. M. Davis, T. O. Drews, H. Ramanan, C. He, J. Dong, H. Schnablegger, E. Kokkoli, A. V. McCormick, R. L. Penn, and M. Tsapatsis), Nature Materials, **5**, 400, (2006).

44. Stochastic modeling and simulation of traffic flow: ASEP with Arrhenius look-ahead dynamics, (with A. Sopasakis), SIAM J. Appl. Math., **66**, 921-944, (2006).

45. Intermittency, metastability and coarse-graining in deterministic/stochastic lattice systems (with A. J. Majda and A. Sopasakis), Nonlinearity **19**, 1021-1047, (2006).

46. Error control and analysis in coarse-graining of stochastic lattice dynamics (with P. Plecháč and A. Sopasakis), SIAM J. Num. Analysis **4** (6), 2270-2296 (2006).

47. Stochastic Hydrodynamical Limits of Particle Systems (with A. Szepessy), Comm. Math. Sci. **4**, 513-549, (2006).

48. The role of multiple microscopic mechanisms in cluster interface evolution, (with G. Karali), J. Diff. Eq., **235** no. 2, 418–438, (2007).

49. A finite element method via noise regularization for the stochastic Allen-Cahn problem (with G. T. Kossioris and O. Lakkis), J. Interfaces and Free Boundaries, **9** (2007), no. 1, 1–30. (2007).

50. Coarse-graining schemes and a posteriori error estimates for stochastic lattice systems (with P. Plecháč, L. Rey-Bellet and D. Tsagkarogiannis), ESAIM-Math. Model. Num. Analysis, **41** (3), 627-660, (2007).

51. Prototype hybrid couplings of deterministic/stochastic systems (with A. J. Majda and A. Sopasakis), Contemp. Math. AMS Series, *Editors:* G.-Q. Chen, E. Hsu, and M. Pinsky, **429**, 143-188, (2007).

52. Mathematical strategies in the coarse-graining of extensive systems: error quantification and adaptivity (with P. Plecháč, L. Rey-Bellet and D. Tsagkarogiannis), J. Non Newt. Fluid Mech, 152 101112 (2008).

53. Numerical and Statistical Methods for the Coarse-Graining of Many-Particle Stochastic Systems (with P. Plecháč and L. Rey-Bellet), J. Sci. Comp. **37**, 43-71, (2008).

54. Multi-body interactions in coarse-graining schemes for extended systems (with S. Are, P. Plecháč and L. Rey-Bellet), SIAM Sci. Comp., 31, No. 2, 9871015, (2008).

55. A Hamilton Jacobi theory for controlled gradient flows in infinite dimensions, (with J. Feng), Arch. Rat. Mech. Analysis **192**, 2 , 275-310 (2009).

56. Coarse-Grained Langevin Approximations and Spatiotemporal Acceleration for Kinetic Monte Carlo Simulations of Diffusion of Interacting Particles, (with S. Are and A. Szepessy), Chinese Annals of Mathematics, Series B, **30** , pp 653-682, (2009), [Special volume dedicated to the sixtieth birthday of Professor Andrew Majda].

57. Hybrid Deterministic Stochastic Systems with Microscopic Look-ahead Dynamics, (with A. J. Majda and A. Sopasakis), Comm. Math. Sci. **8**, 409-437, (2010), [Special volume dedicated to the sixtieth birthday of Professor Andrew Majda].

58. Coupled coarse graining and Markov Chain Monte Carlo for lattice systems, (with Evangelia Kalligiannaki and Petr Plechac), in Numerical Analysis and Multiscale Computations, Ed. B. Enguist, O. Runborg, R. Tsai, Lecture Notes on Computational Science and Engineering (LNCSE), Springer, 2011.

59. Long-time integration methods for mesoscopic models of pattern-forming systems, (with N.M. Abukhdeir, D. G. Vlachos, and M. Plexousakis), J. Comp. Phys. **230**, 5704-5715, (2011).

60. Multilevel coarse graining and nano-pattern discovery in many particle stochastic systems. (with E. Kalligiannaki, P. Plechac and D. G. Vlachos), J. Comp. Phys., **231**, 2599-2620, (2012).

61. Hierarchical fractional-step approximations and parallel kinetic Monte Carlo algorithms (with Giorgos Arampatzis, Petr Plechac, Michela Taufer, Lifan Xu), J. Comp. Phys., **231**, 7795-7814, (2012).

62. Deterministic Equations for Stochastic Spatial Evolutionary Games, (with Sung-Ha Hwang and , Luc Rey-Bellet), Theoretical Economics, 8, 829874, (2013).

63. A Relative Entropy Rate Method for Path Space Sensitivity Analysis of Stationary Complex Stochastic Dynamics, (with Yannis Pantazis), J. Chem. Phys., **138**, 054115, (2013).

64. Parametric Sensitivity Analysis for Biochemical Reaction Networks based on Pathwise Informa tion Theory, (with Y. Pantazis and D.G. Vlachos), BMC Bionformatics, 14:311, (2013).

65. Information-theoretic tools for parametrized coarse-graining of non-equilibrium extended system, (with Petr Plechac), J. Chem. Phys., 139, 074115, (2013).

66. Coarse-graining schemes for stochastic lattice systems with short and long-range interactions, (with Petr Plechac, Luc Rey-Bellet and Dimitrios Tsagkarogiannis), Math. Comp., to appear, (2013).

67. Spatial multi-level interacting particle simulations and information theory-based error quantification, (with E. Kalligiannaki, and P. Plechac), SIAM Sci. Comp., under revision, (2014).

68. Parallelization, processor communication and error analysis in lattice kinetic Monte Carlo, (with G. Arampatzis and P. Plechac), SIAM, Num. Analysis, under revision, (2014).

69. Measuring the Irreversibility of Numerical Schemes for Reversible Stochastic Differential Equations, (with Y. Pantazis and L. Rey-Bellet), ESAIM-Math. Model. Num. Analysis, under revision, (2014).

PROFESSIONAL SERVICE

1. Member of the Editorial Board of SIAM Journal in Mathematical Analysis, 2002-present.

2. Member of the Editorial Board of Communications in Mathematical Sciences, 2006-2011.

3. Reviewer for professional journals such as Archive for Rational Mechanics and Analysis, Communications in PDE, Communications in Mathematical Physics, Journal of Computational Physics, Journal of Chemical Physics, Journal of Differential Equations, Journal of Materials Research, Indiana University Journal, SIAM Control & Optimization, SIAM Mathematical Analysis etc.

4. Served as panelist and reviewer for NSF and DOE and as a reviewer for NIH, the U.S. Civilian Research & Development Foundation (CRDF) and the Netherlands Organisation for Scientific Research (NWO).

GRANTS

1. DOE-Advanced Scientific Computing Research (ASCR) Program, Mathematical Foundations for Uncertainty Quantification in Materials Design 2013-2016, $2,300,000, Principal Investigators: Katsoulakis (UMass), Plechac (UDel), Dupuis (Brown).

2. European Commission and Greek Ministry of Education, Thales Award "AMOSICSS: Analysis, modeling and Simulations of Complex and Stochastic Systems", 2011-2015, Euros 600,000 PI: M.A. Katsoulakis.

3. European Commission FP7-REGPOT-2009-1 Award No 245749 "Archemedes Center for Modeling, Analysis and Computation" 2010-2015, Euros 3,380,000 PI: A. Tzavaras, Co-PIs M. A. Katsoulakis, C. Makridakis, G. Makrakis, C. Tsogka.

4. DOE-ASCR Program, "Multiscale mathematics for biomass conversion to renewable hydrogen" 2009-2013 $2,200,000, Principal Investigators: M. A. Katsoulakis, P. Plechac, D. G. Vlachos.

5. NSF-0835582/0835548/0835673, 2008-2013, Collaborative Research CDI-Type II: Hierarchical Stochastic Algorithms for Materials Engineering, $1,600,000, Principal Investigators: M. A. Katsoulakis, P. Plechac, D. G. Vlachos, Co-PI: B. Oggunaike.

6. DMS-0715125, 2007-2010 AMC-SS: Multiscale Methods for Many-Particle Stochastic Systems: Coarse-Graining and Microscopic Reconstruction, $336,172, Principal Investigator: Katsoulakis

7. NSF, DMS-0619492, 2006-2007. Title: "SCREMS: Computing Equipment for Mathematical Science at UMass Amherst", $84,000, Principal Investigator H. Johnston, co-PIs Gunnells, Katsoulakis, Kevrekidis and Turkington.

8. DOE/Multiscale Mathematics Program, DE-FG02-05ER25702, 2005-2008. Title: Multiscale modeling of spatially distributed biological systems, $1,120,747, Principal Investigator (PI) Vlachos (Chem. Eng. University of Delaware), Co-PIs Edwards (Chem. Eng. University of Delaware) and Katsoulakis, Collaborator: J. Faeder (Theoretical Biology and Biophysics Group, Los Alamos National Laboratory).

9. European Union IRG Marie-Curie grant FP6-517911, 2007-2009. Title: Mathematical strategies towards hierarchical coarse-grainings of multiscale systems, 80,000 Euro, PI Katsoulakis.

10. NSF/Computational Mathematics, DMS-0413864, 2004-2007. (this grant was also sponsored by the Applied Math, Statistics, and MSPA/Materials Programs of the Division of Math. Sciences). Title: Multiscale Stochastic Modeling, Analysis and Computation $314,000, PI Katsoulakis.

11. NSF/Applied Mathematics, DMS-0303565, 2003-2006. Title: Mesoscopic modeling and simulation in micromagnetism, $20,000, PI Katsoulakis; travel supplement to DMS-0219211 supporting visits of Professor Petr Plechac to the USA to collaborate with the PIs.

12. NSF/ITR Program, DMS-0219211, 2002-2006. Title: Mesoscopic modeling and simulation: a novel approach to Monte Carlo methods, $420,000, PI Katsoulakis, Co-PIs Horntrop (Math, NJIT), Vlachos (Chem. Eng. University of Delaware).

13. NSF/Analysis, DMS-0100872, 2001-2004. Title: Mesoscopic modeling in materials science, $84,000, PI Katsoulakis.

14. NSF DMS-0079536, 2000-2003. Title: Scientific Computing Research Environments for the Mathematical Sciences, $120,802, PI Wong, Co-PIs Horntrop, Katsoulakis, Kusner and Sottile.

15. NSF/Analysis-Applied Math, DMS-9801769, 1998-2001. Title: Multi-scale analysis for nonlinear PDE and IPS, $155,043, PI Katsoulakis.

16. European Union TMR grant No. FMRXCT960033 (Conservation Laws) funding for a two-month visit at the Universita di L'Aquila, Italy (January, February 1998).

17. GANG Group grant from NSF, DMS-9626804, 1996-2001. Title: Computational Methods in Mathematics and Physical Sciences, $444,600, PI Norman, co-PIs Katsoulakis, Kusner, Meeks, Pedit, Whitaker.

18. NSF/Classical Analysis grant, DMS-9500717, 1995-98. Title: Multiple scales for Interacting Particle Systems: mesoscopic and macroscopic equations, $50,000, PI Katsoulakis.

HONORS AND AWARDS

1. Katsoulakis was one of the 100 scientists from all fields of science invited to participate in the 13th Annual Frontiers of Science Symposium in November 2001, sponsored by the National Academy of Sciences, USA.

2. UNESCO, Abdus Salam ICTP Visiting Scholar. Fellowship supporting visits and lectures at the Feza Gursey Physics Institute in Instabul, Turkey, 1998-99.

Ph.D. STUDENTS

1. Giorgos Arampatzis, U. of Crete, Ph.D. expected, (2014);

2. Konstantinos Gourgoulias, UMass, Ph.D. expected (2016);

3. William Hu, UMass, Ph.D. expected (2016);

4. Sasanka Are; UMass, Ph.D. December 2008; currently a VP at JP Morgan-Chase, New York.

5. Dimitrios Tsagkarogiannis; UMass, Ph.D. August 2005; currently he a Lecturer (Assistant Professor) University of Sussex, UL; recipient of a prestigious FP7 People Marie-Curie Award for 2008-10 from the European Commission.

6. Zhixiong Chen; UMass, Ph.D. May 2002; currently she is an Associate Professor at the New Jersey City University.

7. Alvin Kho; UMass, Ph.D. May 2000; currently he is a Research Professor of Bioinformatics at the Harvard Medical School.

Past POSTDOCS

1. Dr. Alexandros Sopasakis (2003-2007); currently he is an Associate Professor at the University of Lund, Sweden.

2. Dr. Georgia Karali (2005-06); currently she is an Assistant Professor at the University of Crete, Greece.

3. Dr. Jose Trashorras (2003-04); currently he is an Assistant Professor at Universite Paris IX, France.

INVITED LECTURES AND CONFERENCES

Invited Speaker, DOE PI Meeting New Mexico, August 2013.

Invited Speaker, Workshop on "Coarse graining and condensed matter physics", Hausdorff Research Institute for Mathematics, Bonn, Germany, June, 2012.

Probability Colloquium, Division of Applied Mathematics, Brown University, March 2012.

Panelist, U.S. Department of Energy Workshop for Mathematics for the Analysis, Simulation, and Optimization of Complex Systems, Washington, September 2011.

Invited speaker, 2011 von Neumann Symposium on Multimodel and Multialgorithm Coupling for Multiscale Problems.

Colloquium, ICES, University of Texas-Austin, March 2011.

Organizer, Coarsegraining of manybody systems: analysis, computations and applications Workshop June 27 July 1, 2011, Heraklion, Greece.

Invited speaker, IMA Annual Program Year Workshop Computing with Uncertainty: Mathematical Modeling, Numerical Approximation and Large Scale Optimization of Complex Systems with Uncertainty October 18-22, 2010.

Colloquium, University of Chicago, September 2010.

Stochastic Partial Differential Equations: Approximation, Asymptotics and Computation 28 Jun - 2 Jul 2010, Isaac Newton Institute for Mathematical Sciences, Cambridge, UK.

Organizer for the IPAM Workshop Simulation Hierarchies for Climate Modeling May 3 - 7, 2010, UCLA.

U.S. DOE Applied Mathematics Program meeting May 3-5, 2010, Berkeley, CA

Applied Mathematics Colloquium, Imperial College, London, UK, February 2010.

Colloquium, Department of Mathematics and Bath Institute for Complex Systems, University of Bath, UK, February 2010.

Invited speaker at the IPAM workshop Agent-Based Complex Systems, UCLA October 2009.

Invited panel moderator at the Opening Workshop of the Stochastic Dynamics Program for 20092010 at SAMSI, August 2009.

Invited lecturer at the Summer School and Conference on Kinetics and Statistical Methods for Complex Particle Systems, Lisbon, Portugal, July 2009.

Invited speaker at the ESPRC Symposium Capstone Conference held at Warwick University and Warwick Mathematics Institute in the United Kingdom, June 2009.

Invited speaker at the Conference on Mathematical Challenges in Multi-Phase Materials, Crete, Greece June 2009.

Analysis of Stochastic Surface Evolution: From Microscopic Models to Large Scale Behaviour, January 2009, Max Planck Institute for Mathematics in the Sciences.

International Conference on Contemporary Applied Mathematics in honor of Professor A. J. Majda's 60th birthday, Fudan University, Shangai, PR China, January 2009.

Workshop on Multiscale Methods in Biology, Mathematical Biosciences Institute, Columbus, OH, November 2008.

Scientific Challenges in Solar Energy Conversion and Storage, IMA, Minneapolis, MN, October 2008.

Conference on Stochastic Differential Equations: Models and Numerics, Royal Institute of Technology, Stockholm, Sweden. October 2008.

SIAM Conference on Mathematical Aspects of Materials Science, May, 2008.

Workshop on "Numerical methods in molecular simulation", Hausdorff Research Institute for Mathematics, Bonn, Germany, April, 2008.

Workshop on Analysis and its Applications, University of Athens, Greece, June 2007.

Invited speaker, 2007 John H. Barrett Memorial Lectures at the University of Tennessee in Knoxville, April 2007.

IPAM Workshop , Small Scales and Extreme Events: The Hurricane, February 12 - 16, 2007

Colloquium, School for Computational Science, Florida State University, December 2006.

Colloquium, Iowa State University, October 2006.

4th International workshop on nonequilibrium thermodynamics and complex fluids (IWNET) 3-7 September 2006, Rhodes, Greece September 2006.

Computational and Applied Mathematics Colloquium, University of Chicago, April 2006.

Applied Mathematics Colloquium, University of Notre Dame, April 2006.

Workshop on Stochastic and Statistical Parameterization of Unresolved Features in the Atmosphere and Upper Ocean, National Center for Atmospheric Research, Boulder, February 2006.

International Conference on Stochastic Analysis and Partial Differential Equations, Northwestern University, June 2005

Computational Problems in Physics, Helsinki, May 2005.

Centre de Reserches Mathematiques, Montreal, March 2005.

Brown University, December 2004.

Mathematics of Materials and Macromolecules: Multiple Scales, Disorder, and Singularities, IMA, November 2004.

Second DOE workshop on Multiscale Mathematics, July 2004.

SIAM Conference on Materials Science, May 2004.

Courant Institute, Applied Mathematics Colloquium, March 2004.

Princeton University, Colloquium, October 2003.

New Jersey Institute of Technology, Colloquium, September 2003.

Lectures at the NSF-funded Summer School on "Modern applied mathematics for atmospheric and oceanic sciences" at IPAM (Institute for Pure and Applied Mathematics), July-August 2003.

Computational Challenges in Partial Differential Equations, Isaac Newton Institute for Mathematical Sciences, May 2003.

Conference on Stochastic PDE, Institute for Advanced Study, March 2003.

Workshop on "Multiscale Modeling of Environmental Systems", Statistical and Applied Mathematical Sciences Institute (SAMSI), February 2003.

Rensselaer Polytechnic Institute, November 2002.

AMS Sectional Meeting, Wisconsin, October 2002.

University of Wisconsin, October 2002.

SIAM Annual Meeeting, July 2002.

Notre Dame University, March 2002.

IPAM meeting on "Mathematics of Subgrid-Scale Phenomena in Atmospheric and Oceanic Flows", Jan-Feb 2002.

13th Annual Frontiers of Science Symposium sponsored by the National Academy of Sciences, Irvine, California, November 2001.

Georgia Institute of Technology, November 2001.

Annual Meeting of the American Institute of Chemical Engineers, Reno, Nevada, November 2001.

Thematic Programme on Nonlinear PDE, PIMS, University of British Columbia, July 2001.

Conference on Moving Interfaces and Threshold Dynamics, IPAM, May 2001.

University of Delaware, March 2001.

Brown University, December 2000.

Colloquium, University of Minnesota, November 2000.

First SIAM Meeting on Computational Science and Engineering, Minisymposium organizer (with D. G. Vlachos), September 2000.

SIAM Annual Meeting, Puerto Rico, July 2000.

University of Wisconsin-Madison, June 2000.

Multiscale Models for Surface Evolution, IMA, June 2000.

Nonlinear Analysis 2000 and beyond, Courant Institute, May 2000.

Georgia Institute of Technology, April 2000.

University of Crete, Greece, April 2000.

Worcester Polytechnic Institute, November 1999.

Mesoscale Modeling: Latest Advances for Materials and Structured Fluids, Boston, MA, October 1999.

Brown University, March 1999.

Colloquium, University of Minnesota, February 1999.

AMS Sectional Meeting, Chicago September 1998.

Mini-course on Microscopic and Macroscopic models for phase transitions Feza Gursey Physics Institute, Instabul Turkey, June 1998.

Oberwolfach Meeting on Phase Transitions, Germany, May 1998.

Universita di L' Aquila, Italy January 1998.

Universita di Roma, "Tor Vergata", January 1998.

NSF-CBMS Regional Conference, Atlanta, June 1997.

Colloquium, Georgia Institute of Technology, Atlanta, February 1997.

Clifford Lectures: Conference on the mathematical issues of Phase Transitions, Tulane University, November 1996.

Indiana University, Bloomington, October 1996.

Reaserch Institute in Math. Sciences, Conference on Variational Methods, Kyoto, Japan, June 1996.

Tokyo Metropolitan University, Tokyo, June 1996.

Saitama University, Tokyo, June 1996.

6th International Conference on Conservation Laws, Hong Kong, June 1996.

Brown University, May 1996.

Foundation of Reasearch & Technology-Hellas (FORTH), Iraklion, Greece, January 1996.

Euroconference on Conservation Laws and Numerical Analysis, Anogeia, July 1995.

Colloquium, University of Texas-Austin, February 1995.

Colloquium, University of British Columbia, January 1995.

University of Michigan, November 1994.

Mathematical Sciences Research Institute, May 1994.

University of California at Davis, February, 1994.

University of Wisconsin-Madison, November 1993.

Workshop on Ginzburg-Landau equations, Carnegie-Mellon University, June 1993.

Colloquium, Michigan State University, March 1993.

Workshop on Control & PDE, Philadelphia, December 1992.

University of Wisconsin-Madison, October 1992.

Conference on Kinetics of Phase Transitions, Edinburgh, Scotland, August 1992.

CONFERENCES (organizer)

- "Multiscale Approximations of Kinetic Monte Carlo Simulations", Minisymposium at ICIAM 2011, July 18-22, Vancouver, Canada. Organizers: Markos A. Katsoulakis, Petr Plechac, Raul Tempone.
- "Coarse-graining of many-body systems: analysis, computations and applications", workshop June 27 - July 1, 2011, Heraklion, Greece.
- IPAM Workshop on "Simulation Hierarchies for Climate Modeling" May 3 - 7, 2010, UCLA.
- Mathematical and Computational Methods for Accelerated Molecular, Stochastic and Hybrid Simulation, workshop held at the Foundation for Research and Technology-Hellas (FORTH) in Crete Greece, June 2007.
- "Physical applications of Interacting Particle Systems" at SIAM Conference on Applications of Dynamical Systems at Snowbird, May 2003 [co-organized with P. Mucha (Mathematics, GA Tech)].
- "Modern applied mathematics for atmospheric and oceanic sciences" NSF-funded Summer School at IPAM (Institute for Pure and Applied Mathematics), summer of 2003 [co-organized with M. Green and S. Osher (Mathematics, UCLA) and B. Stevens (Atmospheric Sciences, UCLA)]
- "Mathematics of Subgrid-Scale Phenomena in Atmospheric and Oceanic Flows", IPAM Winter 2002, January 28 - February 5, 2002, Los Angeles, CA [co-organized with K. Emanuel (Atmospheric Sciences, MIT), A. J. Majda (Mathematics, Courant Institute) and B. Stevens (Atmospheric Sciences, UCLA)]
- "Multiscale modeling: Fundamentals and Applications", in the First SIAM Conference on Computational Science and Engineering, Sept. 21-23, 2000, Washington, DC [co-organized with D. G. Vlachos (Chemical Engineering, University of Delaware)].