Maria-Rita Rosaria D'Orsogna
California State University at Northridge, CA 91130
dorsogna@csun.edu (818) 677 2703

Current position:

Associate Director, Institute for Pure and Applied Math, UCLA 2018 - present

Professor, Mathematics Department CSUN 2007 - present

Adjunct Professor, Biomathematics Department UCLA 2012 - present

Professor, Institute for Sustainability CSUN 2008 - present

Research interests:

Statistical mechanics, mathematical modeling, simulations, data analysis of biological and social systems

Education:

Postdoctoral Scholar, Mathematics Department UCLA, 2004 - 2007
Swarming many-body systems in biology and robotics. Ligand-receptor binding in biology

Postdoctoral Scholar, Chemistry Department Caltech, 2003 - 2004
Lattice models and Monte-Carlo simulations of water molecules and biological membranes

Ph.D. Physics University of California at Los Angeles, 2003
Charge transfer in DNA: the role of thermal fluctuations and of symmetry

M.A. Physics, University of Maryland at College Park, 1998
Unified treatment of step-edge fluctuations: limiting cases and crossover behavior

Baccalaureate, Physics, University of Padova, Italy, 1996
Directed paths in random media, discontinuous depinning from rough substrates
Summa cum laude

Professional service and associations:

Referee for the National Science Foundation, National Academy of Sciences, Netherlands Organisation for Scientific Research, Physical Review, SIAM, IEEE Conference Proceedings, Springer Verlag, Physica A and D, European Physical Journal, Journal of Statistical Physics, Journal of Non-Linear Science, Physics Letters A, International Journal of Control, Differential Equations and Dynamical Systems, Current Opinion in Systems Biology, PLoS, Journal of Offender Rehabilitation

Member of the American Physical Society, Society for Industrial and Applied Mathematics, Biophysical Society, American Mathematical Society

Contributions to Gradstein and Ryzhik, 'Table of Integrals, Series and Products', 7^{th} ed.
Found novel integral series. Listed at http://mathworld.wolfram.com/Erf.html

Publications - in press and preparation:

57. *Impacts of California Proposition 47 on crime trends in the city of Santa Monica*
J Crodelle, C Vallejo, M Schmidtchen, C M Topaz, M R D'Orsogna, in preparation (2019)

56. *Dynamical transitions in bistable models of depressive disorder: effects of input and circadian driving* X Cheng, M R D'Orsogna, T Chou, in preparation (2019)

55. *Heterogeneity of polymer network micro-regions formed by end-linking processes*
S CP Norris, A M Kasko, T Chou, M R D'Orsogna, submitted (2019)

54. *How heterogeneous thymic output and T cell proliferation shape immunoclone abundance distributions*, R Dessalles, M R D'Orsogna and T Chou, submitted (2019)

52. *Local alliances and rivalries shape near-repeat terror activity of al-Qaeda, ISIS, and insurgents*
Y L Chuang, N Ben-Asher, M R D'Orsogna, PNAS, **116** 20898-20903 (2019)

53. *Mathematical models of radicalization and terrorism*
Y L Chuang, M R D'Orsogna, in 'Understanding Crime Through Science',
edited by N. Derzsy (Springer, 2019)

51. *A network model of immigration: Enclave formation vs. cultural integration*
Y L Chuang, T Chou and M R D'Orsogna, Networks and Heterogeneous Media, **14** 53-77 (2019)

50. *Exact steady-state distributions of multispecies birth-death-immigration processes: Effects of mutations and carrying capacity on diversity*
R Dessalles, M R D'Orsogna and T Chou, J Stat Phys **173** 182-221 (2018)

49. *The effects of statistical multiplicity of infection on virus quantification and infectivity assays*
B Mistry, M R D'Orsogna and T Chou, Biophys J **114** 2974-2985 (2018)

48. *Age-structured social interactions enhance radicalization*
Y L Chuang, T Chou and M R D'Orsogna, J Math Sociol, **42** 128-151 (2018)

47. *Perturbing the neuroendocrine stress system: modeling HPA axis to improve diagnosis and quantfication of PTSD and related stress disorders*
L U Kim, M R D'Orsogna and T Chou, Comp Psych, **13** 1-22 (2017)

46. *Phthalates, heavy metals and PAHs in an overpopulated coastal region: Inferences from Abruzzo, central Italy* F Stoppa, M Schiazza, J Pellegrini, F Ambrosio, G Rosatelli,
M R D'Orsogna, Mar Poll Bull, **125** 501-512 (2017)

45. *Modeling radicalization: how small violent fringe sects develop into large indoctrinated societies*
M B Short, S G McCalla and M R D'Orsogna, Royal Soc Open Sci **4** 170678 (2017)

44. *Kinetic models for the sensitivity of HIV entry to receptor and coreceptor concentrations*
B Mistry, M R D'Orsogna, N Webb, B H Lee, T Chou, J Phys Chem B, **120** 6189-6199 (2016)

43. *A bistable belief dynamics model for radicalization within sectarian conflict*
Y L Chuang, M R D'Orsogna, T Chou, Quart Appl Math **75** 19-37 (2016)

42. *Swarming in viscous fluids: Three-dimensional patterns in swimmer and force induced flows*
Y L Chuang, T Chou and M R D'Orsogna, Phys Rev E **93** 043112 (2016)

41. *Onset, timing and exposure therapy of stress disorders: mechanistic insight from a mathematical model of oscillating neuroendocrine dynamics*
L U Kim, M R D'Orsogna and T Chou, Biol Direct **11:13** 1-18 (2016)

40. *Growth and containment of a hierarchical criminal network*
C Marshak, M P Rombach, A Bertozzi and M R D'Orsogna, Phys Rev E **93** 022308 (2016)

39. *Crime, punishment and evolution in an adversarial game*
M McBride, R Kendall, M R D'Orsogna and M Short, Euro J Appl Math **10:1017** 1-21 (2015)

38. *First assembly times and equilibration in stochastic coagulation-fragmentation*
M R D'Orsogna, Q Lei and T. Chou, J Chem Phys **139** 014112 (2015)

37. *Physics for better human societies*
M R D'Orsogna and M Perc, Phys Life Rev **12** 40 (2015)

36. *Statistical physics of crime: A review*
M R D'Orsogna and M Perc, Phys Life Rev **12** 1-21 (2015)

35. *Hydrocarbon contamination in sediments of the Pertusillo freshwater reservoir, Val d'Agri Southern Italy*, A Colella and M R D'Orsogna, Fresenius Env Bull **23** 3286-3295 (2014)

34. *First passage problems in biology*
T Chou and M R D'Orsogna, in "First-passage phenomena and their application", 306-345 edited by R Metzler, G Oshanin, S Redner, World Scientific, Singapore (2014)

33. *Recidivism and rehabilitation of criminal offenders: A carrot and stick evolutionary game*
B Berenji, T Chou and M R D'Orsogna, PLoS One **9** e85531 (2014)

32. *Combinatoric and mean-field analysis of heterogeneous self-assembly*
B Zhao, B Berenji, T Chou and M R D'Orsogna, J Chem Phys **139** 121918 (2013)

31. *Criminal defectors lead to the emergence of cooperation in an experimental, adversarial game*
M R D'Orsogna, M McBride, R Kendall and M Short, PLoS One **8** e61458 (2013)

30. *External conversions of player strategy in an evolutionary game: A cost benefit analysis through optimal control*
M Short, A Pitcher and M R D'Orsogna, Euro J Appl Math **24** 131-159 (2013)

29. *Territorial developments based on graffiti: a statistical mechanics approach*
A Barbaro, L Chayes and M R D'Orsogna, Physica A **392** 252-270 (2013)

28. *First passage times in homogeneous nucleation and self-assembly*
R Yvinec, M R D'Orsogna and T Chou, J Chem Phys **137** 244107 (2012)

27. *Desert locust dynamics: behavior phase change and swarming*
C Topaz, M R D'Orsogna, L Keshet and A Bernoff, PLoS Comp Biol **8** e1002642 (2012)

26. *Stochastic self-assembly of incommensurate clusters*
M R D'Orsogna, G Lakatos and T Chou, J Phys Chem **136** 084110 (2012)

25. *Coarsening and accelerated equilibration in mass-conserving heterogeneous nucleation*
T Chou and M R D'Orsogna, Phys Rev E **84** 011608 (2011)

24. *Cooperation and punishment in an adversarial game: How defectors pave the way to peaceful society*
M Short, J Brantingham, M R D'Orsogna, Phys Rev E **82** 066603 (2010)

23. *Diffusion-dependent mechanisms of receptor engagement and viral entry*
M Gibbons, T Chou, M R D'Orsogna, J Phys Chem B **114** 15403-15412 (2010)

22. *Arrival times in a zero-range process with injection and decay*
B Shargel, M R D'Orsogna and T Chou, J Phys A **43** 305003 (2010)

21. *Optimal transport and apparent drug resistance in viral infections*
M R D'Orsogna, T Chou, PLoS One **4** e8165 (2009)

20. *Enhancement of cargo processivity by cooperating molecular motors*
F Posta, M R D'Orsogna, T Chou, Phys Chem Chem Phys **11** 4851-4860 (2009)

19. *Double milling in self-propelled swarms from kinetic theory*
J Carrillo, M R D'Orsogna, V Panferov, Kin Rel Mod **2** 363-378 (2009)

18. *Measuring and modeling repeat and near-repeat burglary effects*
M Short, M R D'Orsogna, G Tita, J Brantingham, J Quant Criminol **25** 325-339 (2009)

17. *A statistical model of criminal behavior*
M Short, M R D'Orsogna, V Pasour, G Tita, P Brantigham, A Bertozzi, L Chayes, Math Mod Meth Appl Sci **18** 1249-1267 (2008)

16. *Multi-stage adsorption of diffusing macromolecules and viruses*
T Chou, M R D'Orsogna, J Chem Phys **127** 105101 (2007)

15. *State transitions and the continuum limit for interacting, self-propelled particles*
Y Chuang, M R D'Orsogna, D Marthaler, A Bertozzi, L Chayes, Phys D **232** 33-47 (2007)

14. *Exact steady states for translocation ratchets driven by random sequential adsorption*
M R D'Orsogna, T Chou, T Antal,A J Phys A **40** 5575-5584 (2007)

13. *Multi-Vehicle flocking: Scalability of Cooperative Control Algorithms using Pairwise Potentials*
Y Chuang, Y Huang, M R D'Orsogna, A Bertozzi, Proceedings from the IEEE International Conference on Robotics and Automation, 2292-2299 (2007)

12. *Self-propelled particles with soft-core interactions: patterns, stability and collapse.*
M R D'Orsogna, Y Chuang, A Bertozzi, L Chayes, Phys Rev Lett **96** 104302 (2006)

11. *Pattern formation, stability and collapse in 2D driven particle systems*
M R D'Orsogna, Y Chuang, A Bertozzi, L Chayes in 'Device applications of non linear dynamics', page 103, edited by A Bulsara and S Baglio (Springer-Verlag, Berlin Heidelberg, 2006)

10. *First Passage and Cooperativity of Queuing Kinetics*
M R D'Orsogna, T Chou, Phys Rev Lett **95** 170603 (2005)

9. *Interparticle gap distributions on one-dimensional lattices*
M R D'Orsogna, T Chou, J Phys A **38** 531-542 (2005)

8. *Chiral molecule adsorption on helical polymers*
M R D'Orsogna, T Chou, Phys Rev E **69** 021805 (2004)

7. *Interplay of chemotaxis and chemokinesis mechanisms in bacterial dynamics*
M R D'Orsogna, M A Suchard, T Chou, Phys Rev E **68** 021925 (2003)

6. *Charge transfer, symmetry, and dissipation in donor-acceptor molecules*
M R D'Orsogna, R Bruinsma, Phys Rev Lett **90** 078301 (2003)

5. *Two-level system with a thermally fluctuating transfer matrix element: Application to the problem of DNA charge transfer*
M R D'Orsogna, J Rudnick, Phys Rev E **66** 041804 (2002)

4. *Fluctuation-facilitated charge migration along DNA*
R Bruinsma, G Grüner, M R D'Orsogna, J Rudnick, Phys Rev Lett **85** 4393-4396 (2000)

3. *Edge diffusion during growth: The kink Ehrlich-Schwoebel effect and resulting instabilities*
O Pierre-Louis, M R D'Orsogna, T Einstein, Phys Rev Lett **82** 3661-3664 (1999)

2. *Wetting of rough walls*
A Stella, G Sartoni, G Giugliarelli, M R D'Orsogna, Int J Thermophys **19** 1209-1218 (1998)

1. *Effect of surface roughness on bulk-disorder-induced wetting*
G Sartoni, A Stella, G Giugliarelli, M R D'Orsogna, Europhys Lett **39** 633-638 (1997)

Seminars and colloquia:

National Research University School of Economics, Moscow, Russia, June 2020

Claremont Center for the Mathematical Sciences, November 2019

Claremont Graduate University, October 2019

RAND Corporation, Santa Monica CA, May 2019

University of Boulder, Colorado, Mathematics Department, February 2019

Middlebury Institute of International Studies, Monterey CA, November 2018

University of Gothenburg, Sweden, Department of Mathematical Sciences, October 2018

University of Nottingham, UK, School of Mathematical Sciences, October 2018

Edinburgh University, UK, School of Mathematics, May 2018

Portland Community College, Portland OR, International Women's Day Luncheon, March 2018

University of California at Santa Barbara, Mathematics Department, February 2018

Northern Arizona University, Flagstaff AZ, International Pavilion, January 2018

Arizona State University, Tempe AZ, Institute for Sustainability, January 2018

University of Arizona, Tucson AZ, Mathematics Department, January 2018

University of Arizona, Tucson AZ, School of Natural Resources and the Environment, January 2018

University of Waterloo, Ontario, Canada, Mathematics Department Holiday Lecture, December 2017

University of California at Los Angeles, Biomathematics Department, April 2017

Aberdeen Proving Ground, Aberdeen MD, April 2017

Adelphi Laboratory Center, Adelphi MD, April 2017
University of Padova, Italy, Physics Department, February 2017
University of Pescara, Italy, Economics Department, February 2017
Hong Kong University, Faculty of Education, Hong Kong, China, December 2016
California State University at Northridge, Interdisciplinary Research Institute, October 2016
USC Institute for Creative Technologies, Los Angeles CA September 2016
Ecole Polytechnique de Montreal, Montreal, Quebec, Canada, September 2016
Institut national de la recherche scientifique, Varennes, Quebec, Canada September 2016
UNAM, Physical Sciences Department, Mexico City, Mexico June 2016
IBM Research Center, Almaden CA, December 2015
RAND Corporation, Santa Monica CA, November 2015
Kavli Institute for Theoretical Physics, Santa Barbara CA, August 2015
Harvey Mudd, Claremont CA, Biology Department, June 2015
University of Pescara, Italy, Economics Department, May 2015
University of Chieti, Italy, Geology Department, December 2014
Georgia Institute of Technology, Atlanta GA, Mathematics Department, October 2014
University of Maribor, Slovenia, Physics Department, April 2014
Case Western University, Cleveland OH, Mathematics Department, April 2014
Université Pierre et Marie Curie, Paris, France, Mathematics Department, March 2014
University of North Carolina at Chapel Hill, Raleigh NC, Mathematics Department, February 2014
University of Colorado, Boulder CO, Mathematics Department, October 2013
University of Cagliari, Italy, Biochemistry Department, June 2013
University of Vienna, Austria, Mathematics Department, June 2012
University of Graz, Austria, Mathematics Department, June 2012
California Nanoscience Initiative, University of California at Santa Barbara, February 2012
University of California at Los Angeles, Biomathematics Department, February 2012
University of California at Riverside, Mechanical Engineering Department, November 2011
University of California at Santa Barbara, Mathematics Department, February 2011
University of Pescara, Italy, Economics Department, December 2010
University of Padova, Italy, Physics Department, June 2009
Centre de Recerca Matematica, Barcelona, Spain, Mathematics Department, June 2009
University of California at Los Angeles, Mechanical Engineering Department, May 2008
University of California at Riverside, Physics Department, February 2008
University of California at Los Angeles, Biomathematics Department, November 2007
University of British Columbia, Vancouver, Canada, Mathematics Department, October 2007
University of Alberta, Canada, Mathematics Department, October 2007
California State University at Northridge, Mathematics Department, May 2007

Purdue University, West Lafayette IN, Physics Department, March 2007

Virginia Tech, Roanoke VA, Engineering and Applied Math Department, March 2007

University of South Florida, Tampa FL, Physics Department, March 2007

University of California at Merced, Math Department, February 2007

University of Virginia, Physics Department, February 2007

University of Michigan at Ann Arbor, Physics Department, January 2007

Claremont Graduate University, Claremont CA, Mathematics Department, December 2006

Carnegie Mellon University, Pittsburg PA, Physics Department, November 2006

George Mason University, Fairfax VA, Physics Department, May 2006

University of Rome La Sapienza, Italy, Physics Department, March 2006

University of California at Los Angeles, Math Department, May 2005

University of California at Los Angeles, Chemistry Department, April 2005

University of Amsterdam, The Netherlands, Physics Department, March 2005

Caltech, Pasadena CA, Chemistry Department, February 2003

University of California at San Diego, Physics Department, February 2003

University of Padova, Italy, Physics Department, June 2002

University of Maryland, College Park MD, Physics Department, September 1998

Conferences and Programs:

Joint Mathematical Meetings of the MAA and AMS, Denver CO, January 2020

Workshop on interdisciplinary topics in Statistical Physics, Padova, Italy,
September 2019 - invited talk

Applied Mathematical Modeling with Topological Techniques, ICERM Brown University,
Providence RI, August 2019

Society for Mathematical Biology annual meeting, Montreal, Canada, July 2019 - invited talk

CIMPA Summer School, Mathematical models in biology and related applications of
partial differential equations, La Habana, Cuba (2019) - invited talk

SIAM conference on dynamical systems, Snowbird, UT May 2019

The science of dreams: blending qualitative theories with the latest advancements in data
and neuroscience, UCLA, Los Angeles CA, April 2019

Mathematical Criminology and Security, Banff, Canada, March 2019 - invited talk

Joint Mathematical Meetings of the MAA and AMS, Baltimore MD, January 2019

Canadian Mathematical Society Winter Meeting, Vancouver BC December 2018 - invited talk

Semana de la Complejidad, Centro de Ciencias de la Complejidad, Mexico City,
Mexico November 2018 - invited talk

Institut Mittag-Leffler, Mathematical Biology Program, Djursholm, Sweden, October 2018 - invited talk

Agent-based modeling in the life sciences, SIAM Meeting, Minnesota MN, August 2018 - invited talk

NASA, NGSS, and the health of planet Earth, JPL, Pasadena CA, July 2018 - invited talk

Agent-based modeling in biological and social systems, Mathematics Research Community, Whispering Pines RI, June 2018 - invited talk

Collective dynamics and self-organization in biological sciences, Edinburgh, UK, May 2018 - invited talk

Tenth International Conference on Climate Change, University of California at Berkeley, April 2018

Climate Action Panel, University of California at Irvine, January 2018 - invited talk

Joint Mathematical Meetings of the MAA and AMS, San Diego CA, January 2018

Cultural analytics at IPAM, Lake Arrowhead, CA December 2017

IMPA Mathematical models and modeling of biophysical phenomena Rio de Janeiro, Brazil December 2017 - invited talk

National Academies Keck Futures Initiatives on Beyond Boundaries, Irvine, CA November 2017

Association for the Advancement of Sustainability in Higher Education (AASHE) Conference, San Antonio, TX October 2017 - invited talk

NATO Advanced Research Workshop, Odessa, Ukraine September 2017 - invited talk

The Fields Institute for Research in Mathematical Sciences Multi-scale Modeling of Wave Structures in Tissues, Toronto, Canada September 2017 - invited talk

Society for Mathematical Biology annual meeting, Salt Lake City, UT July 2017 - invited talk

NetCrime 2017, Indianapolis, IN June 2017 - plenary talk

SIAM conference on dynamical systems, Snowbird, UT May 2017

IPAM Regulatory and epigenetic stochasticity in development and disease, Los Angeles, CA March 2017

Mathematical modeling and computation in medicine and biology, TSIMF, Sanya, China December 2016 - invited talk

European Conference on Mathematical and Theoretical Biology, Nottingham, UK July 2016

11^{th} AIMS conference on dynamical systems, differential equations and applications, Orlando, FL July 2016 - invited talk

Coherent structures in PDEs and their applications, Oaxaca, Mexico June 2016 - invited talk

Fluctuation-driven phenomena in biological systems, Warwick, UK April 2016 - invited talk

Cultural analytics at IPAM, Los Angeles, CA March 2016 - tutorial lecture

Schloss Dagstuhl Leibniz-Zentrum fur Informatik, Germany October 2015 - invited talk

Living systems: from interaction patterns to critical behavior Venice, Italy September 2015 - invited talk

Equadiff, Lyon, France July 2015 - invited talk

SIAM conference on dynamical systems, Snowbird, UT May 2015 - invited talk

Institute for Mathematics and its Applications St. Paul, MN April 2015

National Academies Keck Futures Initiatives on Collective Behavior Irvine, CA November 2014

Kavli Institute for Theoretical Science Santa Barbara, CA July-August 2014

7th International Conference on Biomathematics and Ecology: Education and Research,

Claremont, CA October 2014 - invited talk

10^{th} AIMS conference on dynamical systems, differential equations and applications, Madrid, Spain July 2014 - invited talk

AMS Sectional Meeting, Albuquerque, NM April 2014 - invited talk

IPAM Materials for a sustainable future, Los Angeles, CA September-December 2013

SIAM annual meeting San Diego, CA July 2013 - invited talk

Indo-American Frontiers of Science Symposium Agra, India April 2013 - invited talk

IMPA Mathematical models and modeling of biophysical phenomena
Rio de Janeiro, Brazil March 2013 - invited talk

CEAMOS Third Workshop on Analysis and Modelling of Security
WAMOS 2013, Santiago, Chile January 2013 - invited talk

PIMS Workshop on Computational Criminology, Vancouver, BC September 2012 - invited talk

MoCCsy 5^{th} Annual Symposium, Vancouver, BC September 2012 - invited talk

9^{th} AIMS conference on dynamical systems, differential equations and Applications, Orlando, FL July 2012 - 2 invited talks

SIAM Conference on Nonlinear Waves and Coherent Structures,
Seattle, WA June 2012 - invited talk

Spring Symposium on Game Theory for Security, Sustainability and Health, Stanford, Palo Alto, CA March 2012

10^{th} International Conference on Operations Research, L'Havana, Cuba, March 2012 - invited talk

Emergent behaviour in multi-particle systems with non-local interactions, Banff Interna tional Research Station, Banff, Canada, January 2012 - invited talk

Mathematical Theory and Simulation of Phase Transitions, Beijing, China, November 2011

The USC Physical Sciences in Oncology Center First Annual Short Course, Los Angeles, CA October 2011

Mathematical Biosciences Institute Workshop on New Questions in Probability Theory Arising in Biological Systems, Columbus, OH September 2011

International Congress on Industrial and Applied Mathematics, Vancouver, Canada, July 2011 - invited talk

Foundations of Computational Mathematics, Budapest, Hungary, July 2011 - invited talk

IMPA Mathematical Methods and Modeling of Biophysical Phenomena, Foz do Iguacu, Parana, Brazil, March 2011 - invited talk

Mathematical Biosciences Institute Workshop on Insect Self-organization and Swarming, Columbus, OH March 2011

Southern California Systems Biology Conference, University of California at Irvine, CA Irvine, CA January 2011

Arthur M Sackler Colloquia of the National Academy of Sciences - In the Light of

Evolution V: Cooperation, Irvine, CA January 2011

AMS Sectional Meeting - Los Angeles, CA October 2010 - invited talk

8th International Conference of Numerical Analysis and Applied Mathematics, Rhodes, Greece, September 2010 - invited talk

CAIMS - Dynamical systems, St. John's, Canada, July 2010 - invited talk

SIAM Emerging topics in dynamical systems and partial differential equations Barcelona, Spain, May 2010 - invited talk

AMS Pattern formation in biological systems, St. Paul, MN April 2010 - invited talk

Winter school and 9^{th} ICOR on PDEs and Mathematical Biology, L'Havana, Cuba, February 2010 - invited talk

SIAM Analysis of partial differential equations Miami, FL December 2009 - invited talk

Kinetic and mean-field models in the socio-economic sciences, Edinburgh, Scotland, July 2009 - invited talk

Deterministic and stochastic modeling in computational neuroscience and biology Barcelona, Spain, May 2009 - invited talk

Statistical Mechanics workshop in honor of Attilio Stella's 60^{th} birthday, Venice, Italy, April 2009 - invited talk

Mathematical models in life and social sciences, L'Aquila, Italy, July 2008 - invited talk

Centro oli - per una valutazione degli impatti, Pescara, Italy, July 2008 - invited talk

AIMS seventh international conference on dynamical systems, differential equations and applications, Arlington, TX May 2008 - invited talk

IPAM Optimal Transport, Los Angeles, CA, March-June 2008

Mathematical Systems Biology Symposium, Irvine, CA, February 2008

Biophysical society meeting, Long Beach, CA, February 2008

Dynamics Days, Knoxville, TN, January 2008 - invited talk

SIAM conference on dynamical systems, Snowbird UT, May 2007 - invited talk

International Conference on Robot Automation ICRA 2007, Rome, Italy, April 2007

IPAM Random Shapes, Los Angeles, CA, March-June 2007

Expanders and self-assembly, Hewlett Packard Palo Alto, CA, November 2006 - invited talk

Understanding complex systems, Urbana-Champaign, IL, May 2006

IPAM Cells and Materials, Los Angeles, CA, March-June 2006

Swarming by nature and by design, Los Angeles, CA, February 2006 - invited talk

Dynamics days, Bethesda, MD, January 2006

Conference on statistics, mathematics and related fields, Honolulu, HI, January 2006

Nonlinear control, Pasadena, CA, November 2005 - invited talk

Multi-scale analysis and computation, Los Angeles, CA, November 2005 - invited talk

Device applications of non-linear systems, Catania, Italy, October 2005 - invited talk

Gordon research conference on non-linear systems, Waterville, ME, July 2005

SIAM Dynamical systems, Snowbird, UT, May 2005 - invited talk
Biophysical society meeting, Long Beach, CA, February 2005
StatPhys 22, Bangalore, India, July 2004
Gordon research conference on colloids, Ventura, CA, February 2002
DNA charge transfer workshop, Los Angeles, CA, September 2001
Physics electronics conference, State College, PA, June 1998
American physical society, Various locations, 1998-present

Teaching experience:

Lecturer, Math Department CSUN, 2007-present
Sust 300: Interdisciplinary perspectives on sustainability
Math 140: Introductory statistics
Math 150A, 150B: Calculus I, Calculus II
Math 250: Calculus III
Math 351: Differential equations
Math 592C: Mathematical biology, graduate class

Lecturer, Math Department UCLA, 2004-2007
Biomath 201: Deterministic models in biology, graduate class
Math 142: Math modeling, upper division
Math 31B: Calculus
Math 151a Applied Numerical Methods I, upper division

Organizer and IPAM Associate Director activities:

High-dimensional Hamilton Jacobi PDE-s, IPAM long program Spring 2020

Computational Psychiatry, IPAM workshop, February 2020

Asymptotic Algebraic Combinatorics, IPAM workshop, February 2020

Deep Learning and Medical Applications, IPAM workshop, January 2020

Emerging Opportunities in Mathematics and Microbiome, IPAM workshop, January 2020

Applied Mathematical Modeling with Topological Techniques
ICERM, Brown University, Providence RI, August 2019

Collaborative Workshop for Women in Mathematical Biology, IPAM workshop, June 2019

Geometry and Learning from Data in 3D and beyond 2019, IPAM long program, Spring 2019

Operator Theoretic Methods in Dynamic Data Analysis and Control,
IPAM workshop, February 2019

Computational Challenges in Gravitational Wave Astronomy, IPAM workshop, January 2019

Women in Mathematics and Public Policy, IPAM workshop, January 2019

Culture Analytics, IPAM reunion, December 2018

Agent-based Modeling in Biological and Social Systems, Mathematics Research Communities AMS, Whispering Pines RI, June 2018

Computational Psychiatry: Mechanisms, diagnosis, and treatment of depressive disorders, SIAM Dynamical Systems, Snowbird UT, May 2017

Large Grants awarded:

National Aeronautics and Space Administration, 2019-2024, co-PI
NASA Autonomy Research Center for Science, Technology, Arts, Humanities, and Mathematics, $3.00M

Army Research Office, 2018-2021, PI
Mathematical modeling of limbic system dynamics, pathophysiology, and response to stress $535K

National Science Foundation DMS 2018-2021, PI
Understanding generation, maintenance, and dynamics of immune diversity via clone–count models, $103K

Army Research Office, 2017-2020, PI
Predicting and managing migrant flows: insights from game theoretic, age dependent and networked mathematical models, $375K

Army Research Office, 2014-2017, PI
Warfighter neuroendocrinology: modeling stress response, PTSD and TBI, $535K

Army Research Office MURI 2011-2016, CoPI
Scalable, stochastic and spatiotemporal game theory for real world human adversarial behavior, $580K

National Science Foundation DMS-1021850 2010-2014, PI
Hierarchical kinetic models for chemically and hydrodynamically coupled organisms, $106K

National Science Foundation DMS-0719462 2007-2011, PI
Stochastic models of viral adsorption, fusion and replication, $118K

National Science Foundation DUE-0969627 2010-2013, Senior Personnel
Students Targeting Engineering and Physical Science