Paul J. Atzberger

Professor
Department of Mathematics
University of California, Santa Barbara

Email: atzberg@gmail.com **Phone:** (805) 893 3239
Website: http://atzberger.org/ **Fax:** (805) 893 2385

Education

Courant Institute, New York University	Ph.D. Mathematics	2003
Courant Institute, New York University	M.S. Mathematics	2000
New York University	B.A. Mathematics	1998

Academic Positions

Professor of Mathematics	University of California Santa Barbara	2017 –
Associate Professor of Mathematics	University of California Santa Barbara	2011 – 2017
Assistant Professor of Mathematics	University of California Santa Barbara	2006 – 2011
Postdoctoral Researcher and Instructor	Rensselaer Polytechnic Institute	2003 – 2006
Graduate Student Researcher and Instructor	Courant Institute, New York University	1998 – 2003

Awards and Fellowships

NSF CAREER Award.	2010 – 2015
Hellman Faculty Fellowship	2009 – 2010
VIGRE Postdoctoral Research Fellowship (RPI)	2003 - 2006
Founders' Day Award for Academic Excellence (NYU)	1998

Publications:

For up-to-date list and PDFs of publications and preprints please visit:
http://atzberger.org/

Meshfree Methods on Manifolds for Hydrodynamic Flows on Curved Surfaces: A Generalized Moving Least-Squares (GMLS) Approach, B. J. Gross, N. Trask, P. Kuberry, and P. J. Atzberger, Journal of Computational Physics, Vol. 409, 15 May (2020).

Variational Autoencoders for Learning Nonlinear Dynamics of Physical Systems, R. Lopez, and P. J. Atzberger, (submitted), (available: http://arxiv.org/abs/2012.03448), (2020).

Surface Fluctuating Hydrodynamics Methods for the Drift-Diffusion Dynamics of Particles and Microstructures within Curved Fluid Interfaces, D. Rower, M. Padidar, and P. J. Atzberger, (submitted), (available:https://arxiv.org/abs/1906.01146), (2019).

GMLS-Nets: A Framework for Learning from Unstructured Data, N. Trask, R. G. Patel, B. J. Gross, and P. J. Atzberger, AAAI-MLPS Proceedings (peer-reviewed), (available: http://ceur-ws.org/Vol-2587/article_9.pdf), (2020).

GMLS-Nets: Scientific Machine Learning Methods for Unstructured Data, N. Trask, R. G. Patel, B. J. Gross, and P. J. Atzberger, NeurIPs 2019: Workshop on Machine Learning and the Physical Sciences, (peer-reviewed, four-page limit), (2019).

Heterogeneous Vesicles with Phases having Different Preferred Curvatures: Shape Fluctuations and Mechanics of Active Deformations, D.A. Rower, P.J. Atzberger, (submitted), (available:http://arxiv.org/abs/1901.05085), (2019).

Stochastic Discontinuous Galerkin Methods (SDGM) Based on Fluctuation-Dissipation Balance, W. Pazner, N. Trask, P.J. Atzberger, 4, Results in Applied Mathematics, (2019).

Topological Methods for Polymeric Materials: Characterizing the Relationship Between Polymer Entanglement and Viscoelasticity, E. Panagiotou, K. Millett, and P. J. Atzberger, Polymers, 11(3), 437 (2019).

Importance of the Mathematical Foundations of Machine Learning Methods for Scientific and Engineering Applications, P. J. Atzberger, Position paper accepted for presentation at SciML2018 Workshop, (two-page limit), US Department of Energy, January, (2018).

Hydrodynamic Flows on Curved Surfaces: Spectral Numerical Methods for Radial Manifold Shapes, B. Gross and P.J. Atzberger, 371, pp 663–689, Journal of Computational Physics, (2018).

Spectral Numerical Exterior Calculus Methods for Differential Equations on Radial Manifolds, B. Gross and P.J. Atzberger, 76, pp 145–165, Journal of Scientific Computing, (2018).

Electrostatics of Particle Confinement within Nanochannels: Role of Double-Layer Interactions and Ion-Ion Correlations, I.S. Sidhu, A.L. Frischknecht, P.J. Atzberger, ACS Omega 3 (9), 11340-11353, (2018).

Fluctuating Hydrodynamic Methods for Fluid-Structure Interactions in Confined Channel Geometries, Y. Wang, H. Lei, P. Atzberger, Applied Mathematics and Mechanics (Springer), January, Volume 39, Issue 1, pp 125–152, (2018).

Förster Resonance Energy Transfer: Role of Diffusion of Fluorophore Orientation and Separation in Observed Shifts of FRET Efficiency, B. Wallace, P.J. Atzberger, PLoS ONE 12(5): e0177122, (2017).

Hydrodynamic Coupling of Particle Inclusions Embedded in Curved Lipid Bilayer Membranes, (*featured on journal cover)*, J.K. Sigurdsson and P.J. Atzberger, 12, 6685-6707, Soft Matter, The Royal Society of Chemistry, (2016).

Fluctuating Hydrodynamics Methods for Dynamic Coarse-Grained Implicit-Solvent Simulations in LAMMPS, Y. Wang, J. K. Sigurdsson, and P.J. Atzberger, SIAM J. Sci. Comput. , 38(5), S62–S77, (2016).

Stochastic Reductions for Inertial Fluid-Structure Interactions Subject to Thermal Fluctuations, G. Tabak and P.J. Atzberger, SIAM Journal of Applied Mathematics, 75(4), 1884–1914, (2015).

Simulation of Osmotic Swelling by the Stochastic Immersed Boundary Method, C.H. Wu, T.G. Fai, P.J. Atzberger, and C.S. Peskin, SIAM J. Sci. Comput., 37, (2015).

Shape matters in protein mobility within membranes, F. Quemeneura, J.K. Sigurdsson, M. Rennerf, P.J. Atzberger, P. Bassereaua, and D. Lacosted, Proceedings of the National Academy of Sciences (PNAS), Vol. 11, No. 14, pg. 5083–5087, (2014).

Spatially Adaptive Stochastic Methods for Fluid-Structure Interactions Subject to Thermal Fluctuations in Domains with Complex Geometries, P. Plunkett, J. Hu, C. Siefert, P.J. Atzberger, Journal of Computational Physics, Vol. 277, 15 Nov. 2014, pg. 121--137, (2014).

A First-Passage Kinetic Monte Carlo Method for Reaction-Drift-Diffusion Processes, A. Mauro, J. Shrake. J. Sigurdsson, P. Atzberger, S. Isaacson, Journal of Computational Physics, Vol. 259, 15, pg. 536-567, (2014).

Incorporating Shear into Stochastic Eulerian Lagrangian Methods for Rheological Studies of Complex Fluids and Soft Materials, P.J. Atzberger, Physica D : Nonlinear Phenomena, Physica D, Vol. 265, pg. 57–70, (2013).

Simulation of Edge Facilitated Adsorption and Critical Concentration Induced Rupture of Vesicles at a Surface, P. Plunkett, B. Camley, K. Weirich, J. Israelachvili, P. Atzberger, 9, 8420-8427, Soft Matter, The Royal Society of Chemistry *(featured on cover)*, (2013).

Dynamic Implicit-Solvent Coarse-Grained Models of Lipid Bilayer Membranes : Fluctuating Hydrodynamics Thermostat, Y. Wang, J. K. Sigurdsson, E. Brandt, and P.J. Atzberger, Physical Review E, 88, 023301, (2013).

Force Spectroscopy of Complex Biopolymers with Heterogeneous Elasticity, D. Valdman, B. Lopez, M. T. Valentine, and P.J. Atzberger, Soft Matter, The Royal Society of Chemistry, (2013).

Hybrid Continuum-Particle Method for Fluctuating Lipid Bilayer Membranes with Diffusing Protein Inclusions, J.K. Sigurdsson, F.L.H. Brown, and P.J. Atzberger, Journal of Computational Physics, Vol. 252, pg 65–85, (2013).

Spectral Analysis Methods for the Robust Measurement of the Flexural Rigidity of Biopolymers, D. Valdman, P.J. Atzberger, D. Yu, and M. T. Valentine, Biophysical Journal., Vol. 102, Iss. 5, pg. 1144-–1153, (2012).

Influence of Target Concentration and Background Binding on In Vitro Selection of Affinity Reagents, J. Wang, J. F. Rudzinski, Q. H. Gonga, H.T. Soh, P.J. Atzberger, PLoS ONE 7(8), (2012).

Stochastic Eulerian Lagrangian Methods for Fluid Structure Interactions with Thermal Fluctuations, P.J. Atzberger, Journal of Computational Physics, 230, pp. 2821--2837, (2011).

Stochastic Reduction Method for Biological Chemical Kinetics using Time-Scale Separation, C.D. Pahlajani, M. Khammash, P.J. Atzberger, Journal of Theoretical Biology, Vol. 272, Iss. 1, 7 March, Pages 96-112, (2011).

Experimental Study of the Separation Behavior of Nanoparticles in Micro- and Nano-Channels, M. Napoli, P.J. Atzberger, S. Pennathur, Journal of Microfluidics and Nanofluidics, Volume 10, Issue 1, Page 69, (2011).

Spatially Adaptive Stochastic Numerical Methods for Intrinsic Fluctuations in Reaction-Diffusion Systems, P.J. Atzberger, Journal of Computational Physics, Vol. 229, Iss. 9, 1 May, pp. 3474-3501, (2010).

Hybrid Elastic and Discrete-Particle Approach to Biomembrane Dynamics with Application to the Mobility of Curved Integral Membrane Proteins, A. Naji, P.J. Atzberger and F.L.H. Brown, Physical Review Letters. 102, 138102, (2009).

A Microfluidic Pumping Mechanism Driven by Non-equilibrium Osmotic Effects, P.J. Atzberger, S.A. Isaacson, and C.S. Peskin, Physica D: Nonlinear Phenomena, Vol. 238, Iss. 14, July, pp. 1168-1179, (2009).

Micromagnetic Selection of Aptamers in Microfluidic Channels, X. Lou, J. Qian, X. Yi, L. Viel, A.E. Gerdon, E.T. Lagally, P.J. Atzberger, A.J. Heeger, and H.T. Soh, Proceedings of the National Academy of Sciences (PNAS), Vol. 106 No. 9 pp. 2989-2994, (2009).

On the Foundations of the Stochastic Immersed Boundary Method, P.R. Kramer, C.S. Peskin, and P.J. Atzberger, Computer Methods in Applied Mechanics and Engineering, Vol. 197, Iss. 25-28, 15 April, pp. 2232-2249, (2008).

Error Analysis of a Stochastic Immersed Boundary Method Incorporating Thermal Fluctuations, P.J. Atzberger and P.R. Kramer, Mathematics and Computers in Simulation, Vol. 79, Iss. 3, pg. 379 -- 408, (2008).

A Stochastic Immersed Boundary Method for Fluid-Structure Dynamics at Microscopic Length Scales, P.J. Atzberger, P.R. Kramer, and C.S. Peskin, J. Comp. Phys., Vol. 224, Iss. 2, (2007).

Theoretical Framework for Microscopic Osmotic Phenomena, P.J. Atzberger and P.R. Kramer, Physical Review E, 75, 1, (2007).

A Note on the Correspondence of the Immersed Boundary Method with Thermal Fluctuations To Stokesian-Brownian Dynamics, P.J. Atzberger, Physica D, Vol. 226, Iss. 2, 15, pg. 144-150, (2007).

Velocity Correlations of a Thermally Fluctuating Brownian Particle: A Novel Model of the Hydrodynamic Coupling, P.J. Atzberger, Physics. Letter A, Vol. 351, Iss. 4-5, 6, March, pp. 225-230, (2006).

A Brownian Dynamics Model of Kinesin in Three Dimensions Incorporating the Force-Extension Profile of the Coiled-Coil Cargo Tether, P.J. Atzberger and C.S. Peskin, Bulletin of Mathematical Biology., vol. 68, no. 1, pp. 131-160, (2006).

Grant Support and Awards

DOE ASCR MMICs Center PhIMLs for Machine Learning (founding member), (co-PI with G. Karniadakis, A. Tartakovsky, M. Parks, M. Ainsworth, E. Darve), Department of Energy (DOE) Advanced Scientific Computing Research.

NSF DMS Award: Interfacial Mechanics of Cell Membranes: Stochastic Exterior Calculus Approaches for Curved Fluid Lipid-Protein Bilayers, NSF DMS-1616353, 2016 –.

NSF CAREER Award: Emergent Biological Mechanics of Cellular Microstructures, NSF CAREER DMS-0956210, 2010 – 2015.

Nanoelectrofluidic Systems: New Tools for Nanoparticle Analysis, (co-PI with S. Pennathur, A. Cleland, F. Gibou, T. Squires). W. M. Keck Foundation, 2011 – 2014.

DOE ASCR MMICs Center CM4 for Mesoscale Methods (founding member), emphasis on development of multiscale/multiphysics methods (co-PI with G. Karniadakis, M. Maxey, Weinan E, J. Xu, M. Parks, P. Stinis, E. Darve), Department of Energy (DOE) Advanced Scientific Computing Research (ASCR), 2012 – 2016..

Nanofluidic Technology for Rapid Biomolecule Manipulation and Detection, (with S. Pennathur, F. Gibou), Institute for Collaborative Biotechnologies, 2009 – 2010.

Hellman Faculty Fellowship, 2009 – 2010.

Microscale Stochastic Modeling of Biological Mechanics, NSF DMS-0635535, 2006 – 2009.

Graduate Students

Christian Bueno, (current).

Cole Hawkins, (co-advisor / chair Zheng Zhang).

Aaron Bagnell, (co-advisor/ chair Tim DeVries).

Ben Gross, "Hydrodynamics on Smooth 2-Manifolds with Spherical Topology," graduated 2019.

Arya Pourzanjani, "Novel Computational Methods for Bayesian Hierarchical Modeling in the Biomedical Domain," (co-advisor / chair Linda Petzold), graduated 2019.

Jon Karl Sigurdsson, **"Continuum and Coarse-Grained Modeling of Lipid Bilayer Membranes,"** graduated 2013.

Chia-Chun Fu, **"Multiscale Modeling, Analysis and Simulation in Multiphase Systems,"** (co-advisor / chair G. Leal), graduated 2014.

Pat Plunkett, "Spatially Adaptive Numerical Methods for Stochastic Biophysical Processes," graduated 2013.

Tom Wynne, "Electrokinetic Transport Behavior of Nanoparticles and Reactive Biomolecules in Micro- and Nanouidic Channels," (co-advisor / chair S. Pennathur), graduated 2013.

David Valdman, "Spectral Methods for Analyzing Biological Polymers," graduated 2012.

Per Danzl, "Dynamical Characterization and Feedback Control of Oscillatory Neural Systems," (co-advisor / chair J. Moehlis), graduated 2011.

Jordan Fischer, "Efficiently removing stiffness in the Immersed Boundary Method," (co-advisor / chair H. Ceniceros), graduated 2011.

Patrick Sheppard, "Cellular Strategies for Controlling the Glial Response to Ischemic Injury and Sensitivity Analysis of Stochastic Biochemical Reaction Networks," (co-advisor / chair M. Khummash), graduated 2011.

Undergraduate Students

Patrick Tran, (current).

Ryan Lopez, (current).

Chris McMahon, (current).

David Rower, "Heterogeneous Vesicles with Phases having Different Preferred Curvatures: Shape Fluctuations and Mechanics of Active Deformations," graduated 2019, (went on to graduate program at Massachusetts Institute of Technology (MIT), recipient of National Science Foundation (NSF) Graduate Fellowship).

Misha Padidar, "Hydrodynamic coupling of Microstructures on Curved Fluid Interfaces," graduated 2017, (went to graduate program at Cornell University in Mathematics).

Inderbir Sidhu, "Electrostatics of Colloidal Particles Confined in Nanochannels: Role of Double-Layer Interactions and Ion-Ion Correlations," graduated 2017, (went on to R&D in defense industry, published work as paper in journal ACS Omega of the American Chemical Society).

Bram Wallace, "Förster Resonance Energy Transfer: Role of Diffusion of Fluorophore Orientation and Separation in Observed Shifts of FRET Efficiency," graduated 2016, (went to graduate program at Cornell University in Mathematics, published work as paper in PLoS ONE).

Gil Tabak, "Systematic Reductions in the Stochastic Eulerian-Lagrangian Method for Fluid-Structure Interactions with Thermal Fluctuations," graduated 2013, (went to graduate program at Stanford University, published work as paper in the SIAM Journal of Applied Mathematics).

Justin Shrake, "First-Passage Kinetic Monte-Carlo Methods for the Reaction of Particles Subject to Drift and Diffusion," graduated 2011, (went on to AT&T in R&D division).

Daniel Kerr, "Geometric Dynamics of DnaB Helicase Translocation along Double Stranded DNA and its Effects on FRET Measurements", graduated 2011, (went to graduate program at University of Chicago).

Joseph Rudzinski, "Analysis of Selection Approaches for Aptamer Molecular Libraries," graduated 2010, (went to graduate program at Pennsylvania State University).

Postdoctoral Researchers

Eleni Panagiotou, (co-advised with K. Millet), 2014 – 2016, (went on to faculty position at University of Tennessee at Chattanooga).

Ming Gong, 2015- 2017.

Kai Sikorski, 2013 – 2014, (went on to Goldman Sachs).

Yoahong Wang, 2011 – 2013.

Chetan Pahlajani, (co-advised with M. Khammash), 2008- 2011, (went on to faculty position at Indian Institute of Technology Gandhinaga).

Presentations (subset)

Surface Fluctuating Hydrodynamics Methods: Soft Materials with Fluid-Structure Interactions within Curved Fluid Interfaces, Umass Amherst, Applied Math Seminar, October 2020.

Geometric Approaches for Machine Learning in the Sciences and Engineering, UC Davis, Colloquium, May 2020.

GMLS-Nets: Scientific Machine Learning Methods for Unstructured Data (poster), NeurIPs 2019: Workshop on Machine Learning and the Physical Sciences, Vancouver, Canada, December 2019.

Incorporating Physics-Based Inductive Bias into Machine Learning Methods, Sandia National Laboratories (SNL) (California Location), Livermore, CA, May 2019.

Meshless Methods for Manifolds: GMLS Approximations of Hydrodynamic Responses in Curved Fluid Interfaces, Approximation Theory 16, May 2019.

Challenges and Opportunities using Machine Learning Approaches in the Sciences and Engineering, Sandia National Laboratories (SNL), Alberquerque, NM, April 2019.

Capturing Physical Invariances in Machine Learning Methods for PDE Approximation and Inverse Problems, Pacific Northwestern National Laboratories (PNNL), Webinar, March 2019.

Fluctuating Hydrodynamics for Biological Membranes: Roles of Curvature in Drift-Diffusion Dynamics, Society of Industrial and Applied Mathematics (SIAM) Life Sciences, Minneapolis, MN, August 2018.

Protein Transport in Curved Lipid Bilayer Membranes: An Extended Saffman-Delbruck Approach Incorporating Hydrodynamics in Curvatured Fluid Intefaces, American Physical Society (APS) March Meeting, 2018.

Meshless Methods for Manifolds: Hydrodynamics of Curved Fluid Interfaces and Related Applications, World Congress on Computational Mechanics (WWCM), New York, NY, July 2018.

Importance of the Foundations of Machine Learning for Scientific and Engineering Applications, SciML 2018, Department of Energy (DOE) Workshop, Washington, DC, January 2018.

Fluctuating Hydrodynamic Approaches for Mesoscopic Simulation: Applications in Soft Materials and Fluidics, Colloquium, MEA, University of California San Deigo (UCSD), October 2017.

On Mimetic Computational Approaches from Stochastic Methods to Numerical Exterior Calculus, Sandia National Laboratories (SNL), August 2017.

Hydrodynamic coupling within curved lipid bilayer membranes: The role of curvature in the drift-diffusion dynamics of proteins, (key-note lecture for session on Mechanobiology of Cells, Vesicles and Biomembranes), U.S. National Congress on Computational Mechanics (USNCCM14), July 2017.

An introduction to stochastic analysis motivated by applications in scientific computation and machine learning, UC Santa Barbara, REI Talk, August 2017.

An Introduction to Machine Learning: Foundations and Applications, UC Santa Barbara, SIAM Talk Series, January 2017.

Fluctuating Hydrodynamic Thermostats for kinetic coarse-grained implicit-solvent simulations of lipid bilayer membranes, Biofluids Symposium, Caltech, February 2016.

Fluctuating Hydrodynamics Approaches for Lipid Bilayer Membranes, UCLA, IPAM Workshop: Partial Order: Mathematics, Simulations and Applications, January 2016.

Computational Methods for Mesoscopic Fluid-Structure Interactions Subject to Thermal Fluctuations : Applications in Soft Materials and Microfluidics, Colloquium, Department of Computing and Mathematical Sciences, Caltech, April 2015.

Fluctuating Hydrodynamic Methods for Simulation of Soft Materials : Applications to Polymeric Fluids and Lipid Bilayer Membranes, University of Washington, October 2015.

Computational Methods for Fluid-Structure Interactions Subject to Thermal Fluctuations: Applications in Soft Materials and Microfluidics, University of California Irvine, November 2014.

Fluctuating Hydrodynamics Methods for Complex Geometries, Sandia National Laboratories, October 2014.

Mesoscale Methods for the Hydrodynamics of Microstructures: Applications in Soft Materials and Microfluidics, Northeastern University, March 2014.

Stochastic Eulerian Lagrangian Methods for Fluid-Structure Interactions in Confined Geometry, Society of Industrial and Applied Mathematics (SIAM) Annual Meeting, San Diego, CA, July 2013.

Hybrid Continuum-Particle Thermostats based on Fluctuating Hydrodynamics: Dynamic Implicit-Solvent Coarse-Grained Simulations of Planar Lipid Bilayers and Vesicles, Society of Industrial and Applied Mathematics (SIAM) Materials, Pennsylvania, PA, May 2013.

Force Spectroscopy of Complex Biopolymers with Heterogeneous Elasticity (poster), Biophysical Society Annual Meeting, Philidelphia, PA, January 2013.

New Approaches for Dynamic Simulations of Implicit Solvent Coarse-Grained Models of Lipid Bilayer Membranes (poster), Biophysical Society Annual Meeting, Philidelphia, PA, January 2013.

Fluctuating Hydrodynamics for Dynamic Simulations of Coarse-Grained Implicit-Solvent Models of Lipid Bilayer Membranes, Society of Industrial and Applied Mathematics (SIAM) Computer Science and Engineering (SCE) Conference, Boston, MA, January 2013.

Spatially Adaptive Methods for Fluid-Structure Interactions subject to Thermal Fluctuations (poster), Department of Energy (DOE), Advanced Scientific Computing Research (ASCR), Applied Mathematics Program Meeting, Albuquerque, NM, August 2013.

Fluctuating Hydrodynamics Thermostats for Dynamic Implicit-Solvent Coarse-Grained Simulations (poster), LAMMPS Workshop, Albuquerque, NM, August 2013.

Fluctuating Hydrodynamics Thermostats for Dynamic Studies of Soft Materials Using Implicit-Solvent Coarse-Grained Models, Society of Industrial and Applied Mathematics (SIAM) Annual Meeting, San Diego, CA, July 2013.

Stochastic Analysis: Analytic and Computational Approaches (Part I of Lecture Series), Shanghai Jiao Tong University, China, May 2012.

Mathematical Problems in Soft Condensed Matter (Part II of Lecture Series), Shanghai Jiao Tong University, China, May 2012.

Biophysics and Biomathematics: Current Challenges and Future Directions (Part IIIof Lecture Series), Shanghai Jiao Tong University, China, May 2012.

Stochastic Eulerian Lagrangian Methods for Fluid-Structure Interactions Subject to Thermal Fluctuations, Kavli Institute for Theoretical Physics (KITP), Santa Barbara, CA, June 2012.

Fluctuating Lipid Bilayer Membranes with Diffusing Protein Inclusions : Hybrid Continuum-Particle Model, Kavli Institute for Theoretical Physics (KITP), Santa Barbara, CA, June 2012.

New Approaches for Microscopic Hydrodynamics for the Study of Fluid-Structure Interactions Subject to Thermal Fluctuations, American Physical Society (APS) March Meeting, San Diego, CA, March 2012.

Spectral Analysis Methods for the Robust Measurement of the Flexural Rigidity of Biopolymers (poster), Biophysical Society (BPS) Annual Meeting, San Diego, March 2012.

Fluctuating Lipid Bilayer Membranes with Diffusing Protein Inclusions: Hybrid Continuum-Particle Model, American Physics Society (APS) March Meeting, Boston, MA, February 2012.

Stochastic Reduction Methods for Biological Chemical Kinetics using Time-Scale Separation, University of California Santa Barbara, Integrative Graduate Education and Research Traineeship (IGERT) Seminar, Santa Barbara, CA, February 2012.

Stochastic Eulerian Lagrangian Methods for Fluid-Structure Interactions Subject to Thermal Fluctuations, International Conference on Applied Mathematics (ICIAM), Vancouver, Canada, May 2012.

Fluctuating hydrodynamics for coarse-grained implicit solvent models of soft materials, American Physics Society (APS) Division of Fluids, San Diego, November 2012.

Hydrodynamics of Lipid Bilayer Membranes, Lawrence Berkeley National Labs (LBNL), Berkeley, CA, November 2012.

Capillary Electrophoresis in Nanochannels, Nanotech,Conference and Exposition, Boston, MA, June 2011.

Robust filament tracking and spectral analysis techniques to determine bending stiffness of uniform and heterogeneous biopolymers (poster), 12th Annual University of California Systemwide Bioengineering Symposium, San Diego, CA, July 2011.

Numerical Methods for SPDEs based on Fluctuation-Dissipation Balance: Applications to Implicit Solvent Models with Fluctuating Hydrodynamics, Society for Industrial and Applied Mathematics (SIAM) Meeting on Partial Differential Equations, San Diego, CA, November 2011.

Organization of Conferences, Workshops, Minisymposiums

Developments in Machine Learning: Foundations and Applications: Parts I -- III,
(minisymposium), Society of Industrial and Applied Mathematics (SIAM) Annual Meeting, Toronto, Canada (virtual), July 2020.

Advances in Computational Biology Workshop, (organizer), UCSB (virtual), May 2020.

Data-Driven Approaches for the Sciences and Engineering: Recent Developments and Adaptations, (minisymposium), Society of Industrial and Applied Mathematics (SIAM) Computational Science and Engineering (CSE), February 2019.

Mathematical Challenges in Interfacial Phenomena in Cell Biology: Parts I – II,
(minisymposium),Society of Industrial and Applied Mathematics (SIAM) Life Sciences Meeting, August 2018.

Mesoscale Computational Approaches for Heterogeneous Materials, (minisymposterium), Society of Industrial and Applied Mathematics (SIAM) Computational Science and Engineering (CSE), February 2017.

Active Complex Fluids in Biology at Multiple Scales,
(minisymposium), Society of Industrial and Applied Mathematics (SIAM) Annual Meeting, July 2014.

Physical Principles of Multiscale Modeling, Analysis, and Simulation in Soft Condensed Matter,
(4 month workshop), Kavli Institute for Theoretical Physics (KITP), April 2012 – July 2012.

Fluid-Structure Interactions: Applications and Advances in Numerical Methods,
(minisymposium), SIAM Annual Meeting, July 2013.

Intracellular Processes: Stochastic Modeling and Numerical Methods (minisymposium), SIAM CSE Conference, Jan 2013.

Partial Differential Equations for Biomolecular Interactions: Electrostatics, Hydrodynamics, and Fluctuations (minisymposium), SIAM PDE, Nov 2011.

Coarse-Grained Stochastic Models in Soft Condensed Matter: Part I -- II,
(minisymposium), Society of Industrial and Applied Mathematics (SIAM) Materials, May 2010.

Complex Fluids in Biological Systems: Parts I – II,
(minisymposium), Society of Industrial and Applied Mathematics (SIAM) Life Sciences Meeting, August 2008.

Mathematical Modeling and Simulation of Biological Membranes: Parts I – II,
(minisymposium), Society of Industrial and Applied Mathematics (SIAM) Annual Meeting, July 2008.

Stochastic Dynamics of Cellular Processes,
(minisymposium), Society of Industrial and Applied Mathematics (SIAM) Dynamical Systems, May 2007.

Applications of Mathematics in Biology, Physiology, and Medicine: in Honor of Charles Peskin's and David McQueen's 60th Birthdays,
(two-day conference), Courant Institute of Mathematical Sciences, New York University, October 2006.
