

# DAVID SAINTILLAN

Mechanical and Aerospace Engineering  
University of California San Diego  
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## RESEARCH INTERESTS

Fluid Dynamics	Soft-Matter Physics	Hydrodynamic Stability
Complex Fluids	Microfluidics	Dynamical Systems
Biological Fluid Dynamics	Biophysics	Mathematical Modeling
Microscale Transport	Electrokinetics	Scientific Computing

## EDUCATION

Stanford University, Ph.D., Mechanical Engineering, 2006

Co-Advisors: Professor Eric S. G. Shaqfeh and Professor Eric Darve

Dissertation title: Collective Dynamics in Dispersions of Anisotropic and Deformable Particles

Stanford University, M.S., Mechanical Engineering, 2003

École Polytechnique, France, Diplôme d'Ingénieur, 2001

Lycée Louis-Le-Grand, France, Classes préparatoires, 1996 – 1998

## ACADEMIC EMPLOYMENT

Professor, Mechanical and Aerospace Engineering, University of California San Diego, 2017 – Present

Associate Professor, Mechanical and Aerospace Engineering, University of California San Diego, 2013 – 2017

Assistant Professor, Mechanical Science and Engineering, University of Illinois at Urbana-Champaign, 2008 – 2013  
Faculty Affiliate in the Computational Science and Engineering Program

Associate Research Scientist, Courant Institute of Mathematical Sciences, New York University, 2006 – 2008  
Postdoctoral Mentor: Professor Michael J. Shelley

## HONORS AND AWARDS

Professeur Invité, Chaire Paris Sciences, ESPCI, Paris, France, 2019

Fellow of the American Physical Society, 2018

Professeur Invité, Chaire Joliot, ESPCI, Paris, France, 2015, 2017

Teacher of the Year, Mechanical and Aerospace Engineering, UCSD, 2014 – 2015

National Science Foundation CAREER Award, Division of Engineering, 2012 – 2017

University of Illinois List of Teachers Ranked as Excellent by Their Students, 2008, 2009, 2010, 2011, 2012, 2013

Professeur Invité, Chaire Total-ESPCI ParisTech, ESPCI, Paris, France, July 2012

Pi Tau Sigma Gold Medal in Mechanical Engineering, 2011

Arnold O. Beckman Research Award, University of Illinois Research Board, 2010

Maître de Conférence Invité, Aix-Marseille Université, France, July 2008

Andreas Acrivos Dissertation Award in Fluid Dynamics, American Physical Society, 2007

Courant Institute of Mathematical Sciences Postdoctoral Fellowship, 2006 – 2008

Gerald J. Lieberman Graduate Fellowship, 2005 – 2006

Edgar N. Meakin Memorial Fellowship, 2001 – 2003

Fondation de l'École Polytechnique Scholarship, 2001

## REFEREED JOURNAL PUBLICATIONS

(advised students and postdocs in bold)

1. **B. Chakrabarti**, Y. Liu, O. du Roure, A. Lindner, D. Saintillan, “Signatures of elastoviscous buckling in the dilute rheology of stiff polymers,” submitted (2021).
2. A. Nourhani, D. Saintillan, “Spontaneous directional flow of active magnetic particles,” *Physical Review E*, to appear (2021).
3. **D. Das**, D. Saintillan, “A three-dimensional small deformation theory for electrohydrodynamics of dielectric drops”, *Journal of Fluid Mechanics*, **914** A22 (2021).
4. O. Chepizhko, D. Saintillan, F. Peruani, “Revisiting the emergence of order in active matter,” *Soft Matter*, Advance Article (2021).
5. **A. Mahapatra**, D. Saintillan, P. Rangamani, “Transport phenomena in fluid films with curvature elasticity”, *Journal of Fluid Mechanics*, **905** A8 (2020).
6. **B. Chakrabarti**, D. Saintillan, “Shear-enhanced dispersion in peristaltic flow”, *Physics of Fluids*, **32** 113102 (2020).
7. **B. Chakrabarti**, **C. Gaillard**, D. Saintillan, “Trapping, gliding, vaulting: Transport of semiflexible polymers in periodic post arrays,” *Soft Matter*, **16** 5534 (2020).
8. **B. Chakrabarti**, Y. Liu, J. LaGrone, R. Cortez, L. Fauci, O. du Roure, D. Saintillan, A. Lindner, “Flexible filaments buckle into helicoidal shapes in strong compressional flows”, *Nature Physics*, **16** 689 (2020).
9. **B. Chakrabarti**, D. Saintillan, “Hydrodynamic synchronization of spontaneously beating filaments”, *Physical Review Letters*, **123** 208101 (2019).
10. **M. Theillard**, D. Saintillan, “Computational mean-field modeling of confined active fluids,” *Journal of Computational Physics*, **397** 108841 (2019).
11. **R. Alonso-Matilla**, D. Saintillan, “Interfacial instabilities in active viscous films,” *Journal of Non-Newtonian Fluid Mechanics*, **259** 57–64 (2019).  
★ Invited article, special issue on “Complex Fluids in Biological Systems”
12. **M. Theillard**, F. Gibou, D. Saintillan, “Sharp numerical simulation of two-phase flows,” *Journal of Computational Physics*, **391** 91–118 (2019).
13. **B. Chakrabarti**, D. Saintillan, “Spontaneous oscillations, beating patterns and hydrodynamics of active microfilaments,” *Physical Review Fluids*, **4** 043102 (2019)
14. **R. Alonso-Matilla**, **B. Chakrabarti**, D. Saintillan, “Transport and dispersion of active particles in periodic porous media,” *Physical Review Fluids*, **4** 043101 (2019).
15. D. Saintillan, M. J. Shelley, A. Zidovska, “Extensile motor activity drives coherent motions in a model of interphase chromatin,” *Proceedings of the National Academy of Sciences of the USA*, **115** 11442–11447 (2018).  
★ In the news: *Phys.org*, *ScienceDaily*
16. Y. Liu, **B. Chakrabarti**, D. Saintillan, A. Lindner, O. du Roure, “Morphological transitions of flexible filaments in shear flow,” *Proceedings of the National Academy of Sciences of the USA*, **115** 9438–9443 (2018).
17. **R. Alonso-Matilla** & D. Saintillan, “Microfluidic flow actuation using magnetoactive suspensions,” *Europhysics Letters*, **121** 24002 (2018).
18. D. Saintillan, “Rheology of active fluids,” *Annual Review of Fluid Mechanics*, **50** 563–592 (2018).

19. **D. Das** & D. Saintillan, “Electrohydrodynamics of viscous drops in strong electric fields: Numerical simulations,” *Journal of Fluid Mechanics*, **829** 127–152 (2017).
20. **M. Theillard**, **R. Alonso-Matilla** & D. Saintillan, “Geometric control of active collective motion,” *Soft Matter*, **13** 363–375 (2017).
21. **D. Das** & D. Saintillan, “A nonlinear small-deformation theory for transient droplet electrohydrodynamics,” *Journal of Fluid Mechanics*, **810** 225–253 (2017).
22. **R. Alonso-Matilla**, **B. Ezhilan** & D. Saintillan, “Microfluidic rheology of active particles suspensions: Kinetic theory,” *Biomicrofluidics*, **10** 043505 (2016).  
 ★ Invited article, special issue on “Microfluidic Rheology”
23. **H. Manikantan** & D. Saintillan, “Effect of flexibility on the growth of concentration fluctuations in a suspension of sedimenting fibers: Particle simulations,” *Physics of Fluids*, **28** 013303 (2016).
24. **H. Manikantan** & D. Saintillan, “The buckling transition of a semiflexible filament in extensional flow,” *Physical Review E: Rapid Communications*, **92** 041002 (2015).
25. **B. Ezhilan**, **R. Alonso-Matilla** & D. Saintillan, “On the distribution and swim pressure of run-and-tumble particles in confinement,” *Journal of Fluid Mechanics: Rapids*, **781** R4 (2015).
26. T. Brotto, D. Bartolo & D. Saintillan, “Spontaneous flows in suspensions of active cyclic swimmers,” *Journal of Nonlinear Science*, **5** 1125–1139 (2015).  
 ★ Invited article, special issue on “Emergent Collective Behavior”
27. R. Dong, J. Li, I. Rozen, **B. Ezhilan**, T. Xu, C. Christianson, W. Gao, D. Saintillan, B. Ren & J. Wang, “Vapor-driven propulsion of catalytic micromotors,” *Scientific Reports*, **5** 13226 (2015).
28. **B. Ezhilan** & D. Saintillan, “Transport of a dilute active suspension in pressure-driven channel flow,” *Journal of Fluid Mechanics*, **777** 482–522 (2015).
29. A. Bricard, J.-B. Caussin, O. Chepizhko, **D. Das**, C. Savoie, V. Chikkadi, F. Peruani, D. Saintillan & D. Bartolo, “Emergent vortices in populations of colloidal rollers,” *Nature Communications*, **6** 7470 (2015).
30. **B. Ezhilan**, W. Gao, A. Pei, I. Rozen, R. Dong, B. Jurado-Sánchez, J. Wang & D. Saintillan, “Motion-based threat detection using microrods: Experiments and numerical simulations,” *Nanoscale*, **7** 7833–7840 (2015).
31. **H. Manikantan**, L. Li, S. E. Spagnolie & D. Saintillan, “The instability of a sedimenting suspension of weakly flexible fibres,” *Journal of Fluid Mechanics*, **756** 935–964 (2014).
32. J. Orozco, B. Jurado-Sánchez, G. Wagner, W. Gao, R. Vazquez-Duhalt, S. Sattayasamitsathit, M. Galarnyk, A. Cortés, D. Saintillan & J. Wang, “Bubble-propelled micromotors for enhanced transport of passive tracers,” *Langmuir*, **30** 5082–5087 (2014).
33. **A. Lefauve** & D. Saintillan, “Globally aligned states and hydrodynamic traffic jams in confined suspensions of active asymmetric particles,” *Physical Review E: Rapid Communications*, **89** 021002 (2014).
34. L. Li, **H. Manikantan**, D. Saintillan & S. Spagnolie, “The sedimentation of flexible filaments,” *Journal of Fluid Mechanics*, **735** 705–736 (2013).
35. D. Saintillan & M. J. Shelley, “Active suspensions and their nonlinear models,” *Comptes Rendus Physique*, **14** 497–517 (2013).  
 ★ Invited review, thematic issue on “Living Fluids”.
36. **B. Ezhilan**, M. J. Shelley & D. Saintillan, “Instabilities and nonlinear dynamics of concentrated active suspensions,” *Physics of Fluids*, **25** 070607 (2013).  
 ★ Invited article, special section on “Mobile Particulate Systems”  
 ★ Also featured on the cover of the July 2013 issue of *Physics of Fluids*

37. **H. Manikantan** & D. Saintillan, “Subdiffusive transport of fluctuating elastic filaments in cellular flows,” *Physics of Fluids*, **25** 073603 (2013).
38. **D. Das** & D. Saintillan, “Electrohydrodynamic interaction of spherical particles under Quincke rotation,” *Physical Review E*, **87** 043014 (2013).
39. **B. Ezhilan**, **A. Alizadeh Pahlavan** & D. Saintillan, “Chaotic dynamics and oxygen transport in thin films of aerotactic bacteria,” *Physics of Fluids* **24** 091701 (2012).
40. **R. Vishnampet** & D. Saintillan, “Concentration instability of sedimenting spheres in a second-order fluid,” *Physics of Fluids* **24** 073302 (2012).
41. D. Saintillan & M. J. Shelley, “Emergence of coherent structures and large-scale flows in motile suspensions,” *Journal of the Royal Society Interface* **9** 571–585 (2012).
42. **J. S. Park** & D. Saintillan, “From diffusive dynamics to local aggregation: Effect of surface contamination in diplophoresis,” *Soft Matter* **7** 10720 (2011).
43. J. G. Gibbs, **S. Kothari**, D. Saintillan & Y.-P. Zhao, “Geometrically designing the kinematic behavior of catalytic nanomotors,” *Nano Letters* **11** 2543–2550 (2011).
44. **J. S. Park** & D. Saintillan, “Electric-field-induced ordering and pattern formation in colloidal suspensions,” *Physical Review E* **83** 041409 (2011).
45. **A. Alizadeh Pahlavan** & D. Saintillan, “Instability regimes in flowing suspensions of swimming micro-organisms,” *Physics of Fluids*, **23** 011901 (2011).  
 \* Also featured in the “Research Highlights” on the *Physics of Fluids* website, January 2011
46. D. Saintillan, “The dilute rheology of swimming suspensions: A simple kinetic model,” *Experimental Mechanics* **50** 1275–1281 (2010).  
 \* Invited article, special issue on “Mechanical Aspects of Biological Locomotion”
47. **J. S. Park** & D. Saintillan, “Diplophoresis in large-scale suspensions of ideally polarizable spheres,” *Journal of Fluid Mechanics* **662** 66–90 (2010).
48. D. Saintillan, “Extensional rheology of active suspensions,” *Physical Review E* **81** 056307 (2010).  
 \* Also featured in *Physical Review E*’s “Kaleidoscope”, <http://pre.aps.org/kaleidoscope/May2010>
49. **F. Pignatelli**, M. Nicolas, E. Guazzelli & D. Saintillan, “Falling jets of particles in viscous fluids,” *Physics of Fluids* **21** 123303 (2009).  
 \* Also featured on the cover of the December 2009 issue of *Physics of Fluids*
50. K. A. Rose, B. Hoffman, D. Saintillan, E. S. G. Shaqfeh & J. G. Santiago, “Hydrodynamic interactions in metal rod-like particle suspensions due to induced charge electrophoresis,” *Physical Review E* **79** 011402 (2009).
51. D. Saintillan & M. J. Shelley, “Instabilities, pattern formation and mixing in active suspensions,” *Physics of Fluids* **20** 123304 (2008).  
 \* Also selected to appear in the *Virtual Journal of Biological Physics Research*, January 1 2009
52. D. Saintillan, “Nonlinear interactions in electrophoresis of ideally polarizable particles,” *Physics of Fluids* **20** 067104 (2008).
53. D. Saintillan & M. J. Shelley, “Instabilities and pattern formation in active particle suspensions: Kinetic theory and continuum simulations,” *Physical Review Letters* **100** 178103 (2008).  
 \* Also selected to appear in the *Virtual Journal of Biological Physics Research*, May 1 2008
54. D. Saintillan & M. J. Shelley, “Orientational order and instabilities in suspensions of self-locomoting rods,” *Physical Review Letters* **99** 058102 (2007).  
 \* Also selected to appear in the *Virtual Journal of Biological Physics Research*, August 1 2007

55. D. Saintillan, E. S. G. Shaqfeh & E. Darve, “Stabilization of a suspension of sedimenting rods by induced-charge electrophoresis,” *Physics of Fluids* **18** 121701 (2006).  
★ Invited article, special section on “Interactions for dispersed systems in Newtonian and viscoelastic fluids”
56. D. Saintillan, E. S. G. Shaqfeh & E. Darve, “The effect of stratification on the wave number selection in the instability of sedimenting spheroids,” *Physics of Fluids* **18** 121503 (2006).
57. D. Saintillan, E. Darve & E. S. G. Shaqfeh, “Hydrodynamic interactions in the induced-charge electrophoresis of colloidal rod dispersions,” *Journal of Fluid Mechanics* **563** 223–259 (2006).
58. D. Saintillan, E. S. G. Shaqfeh & E. Darve, “Effect of flexibility on the shear-induced migration of short-chain polymers in parabolic channel flow,” *Journal of Fluid Mechanics* **557** 297–306 (2006).
59. D. Saintillan, E. S. G. Shaqfeh & E. Darve, “The growth of concentration fluctuations in dilute dispersions of orientable and deformable particles under sedimentation,” *Journal of Fluid Mechanics* **553** 347–388 (2006).
60. D. Saintillan, E. Darve & E. S. G. Shaqfeh, “A smooth particle-mesh Ewald algorithm for Stokes suspension simulations: the sedimentation of fibers,” *Physics of Fluids* **17** 033301 (2005).

## BOOK CHAPTERS

1. D. Saintillan & M. J. Shelley, “Theory of active suspensions,” in *Complex Fluids in Biological Systems*, S. Spagnolie (ed.), Springer (2015).
2. D. Saintillan, “Kinetic models for biologically active suspensions,” in IMA Volume on *Natural Locomotion in Fluids and on Surfaces: Swimming, Flying, Sliding*, S. Childress, A. Hosoi, W. W. Schultz, Z. J. Wang (eds.), Springer (2012).

## REFEREED CONFERENCE PROCEEDINGS

1. J. S. Park & D. Saintillan, “Direct numerical simulations of electrophoretic deposition of charged colloidal suspensions,” *Proceedings of the 4th International Conference on Electrophoretic Deposition*, in *Key Engineering Materials* **507** 47 (2012).  
★ Also featured on the cover of the same issue of *Key Engineering Materials*
2. F. Pignatelli, M. Nicolas, E. Guazzelli & D. Saintillan, “Instabilité d’un jet de particules dans un fluide visqueux,” *19ème Congrès Français de Mécanique*, Marseille, France, August 24–28 2009.
3. D. Saintillan, E. Darve & E. S. G. Shaqfeh, “Microstructure in the sedimentation of orientable and deformable particles,” *ASME International Mechanical Engineering Congress and Exposition*, Orlando, FL, November 5–11 2005 (IMECE2005–80119).
4. D. Saintillan, E. Darve & E. S. G. Shaqfeh, “Induced-charge electrophoresis in suspensions of rodlike particles: theory and simulations,” *ASME International Mechanical Engineering Congress and Exposition*, Orlando, FL, November 5–11 2005 (IMECE2005–80104).
5. D. Saintillan, E. Darve & E. S. G. Shaqfeh, “Dynamic simulations of the instability of sedimenting fibers,” *Proceedings of the 21st International Congress of Theoretical and Applied Mechanics (ICTAM)*, Warsaw, Poland, August 15–21 2004 (Springer).

## NON-REFEREED PUBLICATIONS

1. D. Saintillan, “Physical mechanisms of platelet formation,” *Proceedings of the National Academy of Sciences of the USA*, **117** 21841 (2020).  
★ Invited “Commentary”
2. E. Kanso, D. Saintillan, “Emergent collective behavior: From fish schools to bacterial colonies,” *Journal of Nonlinear Science*, **25** 1051–1052 (2015).  
★ Special issue editorial note

3. D. Saintillan, “Swimming in shear,” *Journal of Fluid Mechanics*, **744** 1–4 (2014).  
★ Invited “Focus on Fluids” article
4. P. R. Nott, R. H. Davis, M. Reeks, D. Saintillan, S. Sundaresan, “Report on IUTAM Symposium on Mobile Particulate Systems: Kinematics, rheology and complex phenomena,” *Physics of Fluids*, **25** 070501 (2013).
5. D. Saintillan, “A quantitative look into microorganism hydrodynamics,” *Physics* **3** 84 (2010).  
★ Invited “Viewpoint” article

## INVITED SEMINAR TALKS

- 2020 Biologically Active Fluids Virtual Seminars, United Kingdom
- 2019 Department of Mechanical Engineering, University of California Santa Barbara, CA  
École Supérieure de Physique et de Chimie Industrielles, Paris, France  
Institute for Advanced Simulation, Forschungszentrum Jülich, Germany  
Applied Mathematics Seminar, Imperial College, London, UK
- 2018 Applied Math Seminar, University of California Merced, Merced, CA  
Center for Soft Matter Research, Department of Physics, New York University, New York, NY  
Department of Mathematics, Zhejiang University, Hangzhou, China  
Engineering Sciences and Applied Mathematics, Northwestern University, Evanston, IL  
Benjamin Levich Institute for Physicochemical Hydrodynamics, New York, NY  
Flatiron Institute, Simons Foundation, New York, NY  
Math Bio Seminar, Department of Applied Mathematics, New Jersey Institute of Technology, Newark, NJ  
Center for Quantitative Modeling in Biology, University of California Riverside, Riverside, CA  
Seminar on Mathematics for Complex Biological Systems, University of California San Diego, La Jolla CA
- 2017 Fluid Mechanics Seminar, University of California Santa Barbara, Santa Barbara, CA
- 2016 Applied and Engineering Physics Seminar, Cornell University, Ithaca, NY  
Penn Institute of Computational Science Colloquium, University of Pennsylvania, Philadelphia, PA  
Swiss Federal Institute of Technology (ETHZ), Zürich, Switzerland  
Fluid Mechanics Seminar, Brown University, Providence, RI  
Applied Math Lab Seminar, Courant Institute, New York University, New York, NY
- 2015 Physics Colloquium, Laboratoire de Physique, École Normale Supérieure de Lyon, Lyon, France  
Biophysics Seminar, École Normale Supérieure, Paris, France  
Fluid Mechanics Seminar, Stanford University, Palo Alto, CA  
Quantitative Biology (qBio) Seminar, University of California San Diego, La Jolla, CA  
Fluid Mechanics Seminar, University of California Los Angeles, Los Angeles, CA
- 2014 Fluid Mechanics Seminar, University of British Columbia, Vancouver, BC, Canada  
GALCIT Colloquium, California Institute of Technology, Pasadena, CA  
Biophysics Seminar, Center for Theoretical Biological Physics, University of California San Diego, La Jolla, CA  
Fluid Mechanics Seminar, University of California Santa Barbara, Santa Barbara, CA  
Department of Aerospace and Mechanical Engineering, University of Southern California, Los Angeles, CA
- 2013 Department of Engineering Sciences and Applied Mathematics, Northwestern University, Evanston, IL  
Department of Mechanical Engineering, University of Washington, Seattle, WA  
Fluid Mechanics Seminar, University of Illinois at Urbana-Champaign, Urbana, IL  
Fluid Mechanics Seminar, University of California San Diego, La Jolla, CA
- 2012 Institute for Computational Engineering and Science Seminar, University of Texas, Austin, TX  
Applied and Computational Mathematics Seminar, University of Wisconsin, Madison, WI  
École Supérieure de Physique et de Chimie Industrielles, Paris, France  
Fluid Mechanics Seminar, Brown University, Providence, RI
- 2011 Applied Physics and Applied Mathematics Seminar, Columbia University, New York, NY

- Mathematics and Its Applications Seminar, University of Illinois at Chicago, Chicago, IL  
 École Supérieure de Physique et de Chimie Industrielles, Paris, France  
 Laboratoire d'Hydrodynamique (LadHyX), École Polytechnique, Palaiseau, France
- 2010 Mechanical Engineering Graduate Seminar, University of Iowa, Iowa City, IA  
 IUSTI Seminar, Polytech' Marseille, Centre National de la Recherche Scientifique, Marseille, France  
 Materials Science Division, Argonne National Laboratory, Argonne, IL  
 Mechanical and Aerospace Engineering Seminar, Polytechnic Institute of NYU, Brooklyn, NY
- 2009 Fluid Mechanics Seminar, University of Illinois at Urbana-Champaign, Urbana, IL
- 2008 Applied Mathematics Seminar, Courant Institute, New York University, New York, NY  
 Mechanical Engineering and Applied Mechanics Seminar, University of Pennsylvania, Philadelphia, PA
- 2007 Fluid Mechanics Seminar, New Jersey Institute of Technology, Newark, NJ  
 Applied Math Lab Seminar, Courant Institute, New York University, New York, NY  
 Fluid Mechanics Seminar, Benjamin Levich Institute for Physicochemical Hydrodynamics, New York, NY
- 2006 Mechanical and Aerospace Engineering, Rutgers University, Piscataway, NJ  
 Applied Math Lab Seminar, Courant Institute, New York University, New York, NY  
 Department of Mechanical Engineering, University of Illinois at Urbana-Champaign, Urbana, IL  
 Division of Engineering and Applied Science, Harvard University, Cambridge, MA

## INVITED CONFERENCE AND WORKSHOP TALKS

- 2021 Society of Mathematical Biology Annual Meeting, virtual  
 American Physical Society March Meeting, virtual
- 2020 Workshop on Microswimmers and Soft Robotics, Technion, Haifa, Israel
- 2019 Shaqfeh Research Symposium, Stanford University, Stanford, CA  
 Workshop on 3D Nucleome, Flatiron Institute, New York, NY  
 Workshop on Physics of Active Matter, Viña del Mar, Chile
- 2018 Annual Meeting of the American Institute of Chemical Engineers, Pittsburgh, PA (keynote)  
 Workshop on Complex Fluids in Biological Systems, Banff International Research Station, Canada  
 International Conference on Nonlinear PDEs, NYU Shanghai, Shanghai, China  
 IMA Workshop on Electrohydrodynamics and Electrodifffusion, Minneapolis, MN  
 Conference on Fundamental Problems in Active Matter, Aspen Center for Physics, Aspen, CO
- 2017 Workshop on Complex Creeping Fluids, Banff International Research Station, Oaxaca, Mexico  
 Workshop on Modeling Complex Fluids for Biological Applications, University of Utah, Salt Lake City, UT  
 Flatiron Institute Workshop on Biological Active Matter, Simons Foundation, New York City, NY  
 Workshop on Physics of Microfluidics, Sde Boker, Israel
- 2016 DFG International Conference on Microswimmers, Bonn, Germany  
 Summer School on Living and Active Soft Matter, Corsica, France  
 Workshop on Active and Smart Matter, Syracuse University, NY  
 Workshop on Fluid Mechanics and Collective Behavior, Ascona, Switzerland (keynote)
- 2015 Society of Engineering Science Technical Meeting, College Station, TX
- 2014 Workshop on "Active fluids: Bridging Complex Fluids and Biofluids", Aspen Center for Physics, Aspen, CO
- 2013 International Symposium on Nonlinear Theory and its Applications, Santa Fe, NM  
 Annual Congress of the Canadian Association of Physicists, Montreal, Canada
- 2012 NYU-Tulane FRG Workshop, New York University, New York, NY  
 IUTAM Symposium on Mobile Particulate Systems, Bangalore, India
- 2011 Workshop on Individual and Collective Dynamics in Active Suspensions, Institut Henri Poincaré, Paris, France  
 SIAM Conference on Applications of Dynamical Systems, Snowbird, UT  
 SIAM Conference on Computational Science and Engineering, Reno, NV

- Workshop on Electrokinetic Phenomena in Nanocolloids and Nanofluidics, Technion, Israel
- 2010 IMA Workshop on Natural Locomotion in Fluids and on Surfaces, Minneapolis, MN  
SIAM conference on Mathematical Aspects of Materials Science, Philadelphia, PA
- 2009 SIAM Conference on Computational Science and Engineering, Miami, FL
- 2008 American Physical Society March Meeting, New-Orleans, LA
- 2007 Andreas Acrivos Award Lecture, 60th APS Division of Fluid Dynamics Annual Meeting, Salt Lake City, UT  
Notions of Biological Locomotion Workshop, Aspen Center for Physics, Aspen, CO  
Self-Organization Workshop, Argonne National Laboratory, Argonne, IL

## CONTRIBUTED CONFERENCE ABSTRACTS

- 2020 73rd Annual Meeting of the APS Division of Fluid Dynamics, virtual
- 2019 72nd Annual Meeting of the APS Division of Fluid Dynamics, Seattle, WA  
Statphys Congress 2019, Buenos Aires, Argentina
- 2018 71st Annual Meeting of the APS Division of Fluid Dynamics, Atlanta, GA  
Annual Meeting of the American Institute of Chemical Engineers, Pittsburgh, PA
- 2017 70th Annual Meeting of the APS Division of Fluid Dynamics, Denver, OR  
88th Annual Meeting of the Society of Rheology, Tampa, FL
- 2016 69th Annual Meeting of the APS Division of Fluid Dynamics, Portland, OR  
MechBio Symposium, University of California San Diego, La Jolla, CA  
SIAM Annual Meeting, Boston, MA  
SIAM conference on Parallel Processing for Scientific Computing, Paris, France
- 2015 68th Annual Meeting of the APS Division of Fluid Dynamics, Boston, MA  
Bifurcations and Instabilities in Fluid Dynamics, Paris, France  
Fluid & Elasticity Meeting, Biarritz, France
- 2014 67th Annual Meeting of the APS Division of Fluid Dynamics, San Francisco, CA  
81st Annual Meeting of the Society of Rheology, Philadelphia, PA  
SIAM Annual Meeting, Chicago, IL
- 2013 66th Annual Meeting of the APS Division of Fluid Dynamics, Pittsburgh, PA  
50th Annual Technical Meeting of the Society of Engineering Science, Providence, RI
- 2012 65th Annual Meeting of the APS Division of Fluid Dynamics, San Diego, CA  
Fluid & Elasticity Meeting, La Jolla, CA  
Annual Meeting of the American Institute of Chemical Engineers, Pittsburgh, PA  
23rd International Congress on Theoretical and Applied Mechanics, Beijing, China  
SoftFlow 2012, Complex Biological Fluids, Cargèse, Corsica, France  
ICREA Symposium on Nanofluidics, Colloids and Membranes, Barcelona, Spain  
86th Annual ACS Colloid and Surface Science Symposium, Baltimore, MD
- 2011 64th Annual Meeting of the APS Division of Fluid Dynamics, Baltimore, MD  
48th Annual Technical Conference of the Society of Engineering Science, Evanston, IL  
4th International Conference on Electrophoretic Deposition, Puerto Vallarta, Mexico
- 2010 63rd Annual Meeting of the APS Division of Fluid Dynamics, Long Beach, CA  
Annual meeting of the American Electrophoresis Society, Salt Lake City, UT  
47th Annual Technical Meeting of the Society of Engineering Science, Ames, IA  
Frontiers in Applied and Computational Mathematics, Newark, NJ  
American Physical Society March Meeting, Portland, OR
- 2009 62nd Annual Meeting of the APS Division of Fluid Dynamics, Minneapolis, MN  
Annual Meeting of the American Institute of Chemical Engineers, Nashville, TN  
81st Annual Meeting of the Society of Rheology, Madison, WI



- Fluid & Elasticity Meeting, Carry-Le-Rouet, France
- 2008 61st Annual Meeting of the APS Division of Fluid Dynamics, San Antonio, TX  
 Annual Meeting of the American Institute of Chemical Engineers, Philadelphia, PA  
 45th Annual Technical Meeting of the Society of Engineering Science, Urbana-Champaign, IL
- 2007 60th Annual Meeting of the APS Division of Fluid Dynamics, Salt Lake City, UT
- 2006 59th Annual Meeting of the APS Division of Fluid Dynamics, Tampa Bay, FL  
 78th Annual Meeting of the Society of Rheology, Portland, ME  
 15th U.S. National Congress on Theoretical and Applied Mechanics, Boulder, CO
- 2005 58th Annual Meeting of the APS Division of Fluid Dynamics, Chicago, IL  
 ASME International Mechanical Engineering Congress and Exposition, Orlando, FL  
 Annual Meeting of the American Institute of Chemical Engineers, Cincinnati, OH  
 SIAM Symposium on Current Research in Engineering and Applied Mathematics, Stanford, CA
- 2004 57th Annual Meeting of the APS Division of Fluid Dynamics, Seattle, WA  
 21st International Congress of Theoretical and Applied Mechanics, Warsaw, Poland

## ACADEMIC TEACHING

### At the University of California San Diego:

- MAE 105 Introduction to Mathematical Physics: Fall 2015, Spring 2017, Fall 2017, Fall 2018, Spring 2020
- MAE 108 Probabilities and Statistics for Engineers: Spring 2015, Spring 2016
- MAE 201 Mechanics of Fluids: Fall 2020
- MAE 207 Complex and Biological Fluids: Winter 2015
- MAE 210A Fluid Mechanics I: Fall 2014, Winter 2017, Fall 2018, Fall 2019
- MAE 210B Fluid Mechanics II: Winter 2016
- MAE 210C Fluid Mechanics III: Spring 2014, Spring 2019, Spring 2020
- MAE 262: Biological Fluid Mechanics: Spring 2017, Winter 2018

### At the University of Illinois:

- TAM 335 Introductory Fluid Dynamics: Spring 2011, Spring 2013
- TAM 435 Intermediate Fluid Dynamics: Fall 2010, Fall 2011, Fall 2012, Fall 2013
- TAM 536 Instability and Transition: Spring 2012
- TAM 541 Mathematical Methods I: Fall 2008, Fall 2009
- TAM 542 Mathematical Methods II: Spring 2009, Spring 2010

## SHORT COURSES

1. "Hydrodynamics of active suspensions: from single swimmers to collective motion," *Short Course on Microswimmers*, Beijing Computational Science Research Center. Beijing, China, October, 14–18 2019 (5 lectures).
2. "Fluid mechanics of active suspensions," *Advanced School on: "Flowing Soft Matter: Bridging the Gap between Statistical Physics and Fluid Mechanics"*, International Center for Mechanical Sciences, Udine, Italy, June 30 – July 4 2014 (3 lectures).
3. "Fluid mechanics of biologically active suspensions," *SoftFlow 2012, Summer School on Biological Complex Fluids*, Cargèse, Corsica, France, June 25 – July 7 2012 (2 lectures).
4. "Electrokinetic phenomena in particulate suspensions: an introduction," *Tutorial on Mathematics of Microfluidic Transport Phenomena*, Institute for Mathematics and its Applications, Minneapolis, MN, December 5 2009 (1 lecture).

## CURRENT RESEARCH ADVISEES

- Yuzhu Chen**, Ph.D. Candidate in Mechanical Engineering, 2020 – Present (co-advised with P. Rangamani)  
Previous institution: Shanghai Jiao Tong University, China
- Tanumoy Dhar**, Ph.D. Candidate in Mechanical Engineering, 2020 – Present  
Previous institution: Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India
- Mohammadhossein Firouznia**, Ph.D. Candidate in Mechanical Engineering, 2018 – Present  
Previous institution: Ohio University, Athens, OH
- Achal Mahajan**, Ph.D. Candidate in Mechanical Engineering, 2016 – Present  
Previous institution: Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India
- Arijit Mahapatra**, Ph.D. Candidate in Mechanical Engineering, 2020 – Present (co-advised with P. Rangamani)  
Previous institution:
- Chenji Li**, M.S. Candidate in Mechanical Engineering, 2019 – Present  
Previous institution: Beijing Institute of Technology, Beijing, China
- Pedro Castilla**, Undergraduate Researcher, 2020 – Present
- Luca Scotzniovsky**, Undergraduate Researcher, 2019 – Present

## PAST RESEARCH ADVISEES

- Maxime Theillard**, Postdoctoral Researcher, 2014 – 2017  
Current Position: Assistant Professor, University of California Merced
- Brato Chakrabarti**, Ph.D. in Mechanical Engineering, 2019  
Ph.D. Thesis: Problems on viscous dynamics of passive and active microfilaments  
Current position: Research Fellow, Center for Computational Biology, Flatiron Institute (Mentor: Michael Shelley)
- Roberto Alonso-Matilla**, Ph.D. in Mechanical Engineering, 2018  
Ph.D. Thesis: Dispersion, rheology, and microfluidic flow actuation of active particle suspensions  
Current position: Postdoctoral Researcher Columbia University (Mentor: Ben O'Shaughnessy)
- Debasish Das**, Ph.D. in Mechanical Engineering, 2016  
Ph.D. Thesis: Electrohydrodynamics of particles and drops in strong electric fields  
Current position: Postdoctoral Researcher, Cambridge University (Mentor: Eric Lauga)
- Barath Ezhilan**, Ph.D. in Engineering Sciences, 2016  
Ph.D. Thesis: Fluid dynamics of active suspensions: Effects of interparticle interactions, external fields and confinement  
Current position: Data Scientist, Optimization and Machine Learning, Amazon
- Harishankar Manikantan**, Ph.D. in Applied Mechanics, 2015  
Ph.D. Thesis: Bending, buckling, tumbling, trapping: Viscous dynamics of elastic filaments  
Current position: Assistant Professor, University of California Davis
- Jae Sung Park**, Ph.D. in Mechanical Engineering, 2012  
Ph.D. Thesis: Collective behavior of colloidal suspensions under electric fields and confinement  
Current position: Assistant Professor, University of Nebraska Lincoln
- Can Yang**, M.S. in Mechanical Engineering, 2020  
M.S. Thesis: Diffusion of run-and-tumble particles in porous media
- Piyush Prakash**, M.S. Mechanical Engineering, 2018  
M.S. Thesis: Geometric control of confined active flow  
Current position: Design and Development Engineer at Fluxergy
- Ku Da**, M.S. in Mechanical Engineering, 2013  
M. S. Thesis: Electrochemical transport and diffuse charge dynamics in nanoscale devices using a Langevin equation  
Current position: Mechanical Engineer, 3M

**Shrenik Kothari**, M.S. in Mechanical Engineering, 2011

M.S. Thesis: Modeling the dynamics of autonomous catalytic nanomotors using the method of regularized Stokeslets  
Current position: Engineer, Thermal and Fluid Core Competency Group, Intel Corporation

**Karthik Chikmagalur**, M.S. in Theoretical and Applied Mechanics, 2011

M.S. Thesis: A study of electrochemical transport and diffuse charge dynamics using a Langevin equation  
Current position: Ph.D Candidate, University of California Santa Barbara

**Amir Alizadeh Pahlavan**, M.S. in Theoretical and Applied Mechanics, 2010

M.S. Thesis: Collective dynamics in flowing suspensions of swimming micro-organisms  
Current position: Ph.D. Candidate in Mechanical Engineering, Massachusetts Institute of Technology

**Yixuan Jia**, M.S. Mechanical Engineering, 2016

**Ramanathan Vishnampet**, M.S. in Mechanical Engineering, 2012

Current position: Senior Research Engineer, ExxonMobil Upstream Research

**Qizheng Yan**, M.S. in Mechanical Engineering, 2010

**Zhengyang Cheng**, M.S. in Mechanical Engineering, 2010

Current position: Hydraulic Engineer, Hydrologic Research Center, San Diego CA

**Maxime Bollard**, Visiting Intern, 2014 – 2015

Other institution: Ecole Centrale Lyon, France

**Antoine Beringer**, Visiting Intern, 2018

Other institution: Ecole Centrale Lyon, France

**Adrien Lefauve**, Visiting Intern, 2013

Current position: Research Fellow, Cambridge University, Cambridge, U.K.

**Albert Le**, Undergraduate Researcher, 2018 – 2019

**Shancheng Li**, Undergraduate Researcher, 2018

**Samuel Park**, Undergraduate Researcher, 2018

**Danny K. Chan**, Undergraduate Researcher, 2016

**Arjun Sharma**, Undergraduate Researcher, 2013

**Thomas W. King**, Undergraduate Research, 2012

## SERVICE AND ACTIVITIES

### EXTERNAL SERVICE

Member of the Fellowship Selection Committee, American Physical Society Division of Fluid Dynamics, 2021 – 2022

Panel Reviewer, National Science Foundation Division of Engineering, 2010 – 2021

Proposal Reviewer, American Chemical Society Petroleum Research Fund, 2009 – 2021

Proposal Reviewer, US – Israel Binational Science Foundation, 2020

Proposal Reviewer, American Chemical Society Petroleum Research Fund, 2009, 2014, 2016, 2018, 2020

Proposal Reviewer, Dutch Research Council. 2020

Proposal Reviewer, European Research Council, 2013, 2015, 2019

Proposal Reviewer, Luxemburg National Research Fund, 2019

Proposal Reviewer, Natural Sciences and Engineering Research Council of Canada, 2019

Member of the Irwin Oppenheim Award selection committee, Physical Review E, 2018-2020

Panel Reviewer, National Science Foundation Division of Engineering, 2010, 2012, 2013, 2014, 2016, 2018

Member of the Executive Committee (elected), American Physical Society Division of Fluid Dynamics, 2017 – 2020

Member of the Nominating Committee, American Physical Society Division of Fluid Dynamics, 2016 – 2018

Proposal Reviewer, Deutsche Forschungsgemeinschaft (German National Research Agency), 2016

Proposal Reviewer, Nederlandse Organisatie voor Wetenschappelijk Onderzoek (Dutch National Research Agency), 2015

Proposal Reviewer, Agence Nationale de la Recherche (French National Research Agency), 2015

Proposal Reviewer, German-Israeli Foundation for Scientific Research and Development, 2014  
Poster Session Judge for the Gallery of Fluid Motion, American Physical Society Division of Fluid Dynamics, 2013  
Member of the External Affairs Committee, American Physical Society Division of Fluid Dynamics, 2012 – 2014  
Poster Session Judge, Annual Meeting of the American Physical Society Division of Fluid Dynamics, 2012  
Proposal Reviewer, Israel Science Foundation, 2009, 2012  
Proposal Reviewer, Department of Energy Office of Basic Science, 2012  
Member of the Scholarship Selection Committee, Pi Tau Sigma, 2012  
Panel Reviewer, National Science Foundation Division of Mathematical Sciences, 2011  
Book review for Springer Verlag, 2010  
Member of the François Frenkiel Award Committee, American Physical Society Division of Fluid Dynamics, 2009 – 2010  
Poster Session Judge for the Gallery of Fluid Motion, American Physical Society Division of Fluid Dynamics, 2010  
Member of the Selection Committee, Programme de bourses d'enseignement en génie et en administration dans les universités québécoises, 2009  
Proceeding Reviewer for International Mechanical Engineering Congress and Exposition, 2005

## EDITORSHIP

Member of the Editorial Board, *Physical Review Fluids*, 2019 – Present  
Member of the Editorial Board, *Physical Review X*, 2018 – Present  
Guest Co-Editor (with E. Kanso), Special Issue of *Journal of Nonlinear Science* on “Emergent Collective Behavior”, 2015

## CONFERENCE ORGANIZATION

Discussion leader, Gordon Conference on Physics and Chemistry of Microfluidics, Hong Kong, China, June 16-21 2019  
Conference Co-Organizer (with S. Spagnolie, B. Thomases, S. Alben, J. Zhang), Conference on Mathematical Fluids, Materials and Biology, Ann Arbor, MI, June 12-14 2019  
Conference Organizer, 11th Southern California Flow Physics Symposium (So Cal Fluids XI), University of California San Diego, La Jolla, CA, April 22 2017  
Session Co-Organizer (with C. Wagner), “Biorheology and Active Fluids”, 88th Annual Meeting of the Society of Rheology, Tampa, FL, February 12-16 2017  
Focus Session Organizer, “Electrohydrodynamics of Drops, Vesicles and Membranes”, 68th Annual Meeting of Division of Fluid Dynamics, American Physical Society, Boston, MA, November 22-24 2015  
Topical Session Co-Organizer (with O. du Roure), 6th International Symposium on Bifurcations and Instabilities in Fluid Dynamics, ESPCI ParisTech, Paris, France, July 15–17 2015  
Conference Co-Organizer (with G. Jacobs, X. Liu, I. Battiato, A. E. Marsden), 9th Southern California Flow Physics Symposium (So Cal Fluids IX), San Diego State University, San Diego, CA, 2015  
Summer School Co-Organizer (with D. Bartolo), “Flowing Soft Matter: Bridging the Gap between Statistical Physics and Fluid Mechanics,” 2014 Summer School, International Center for Mechanical Sciences, Udine, Italy, June 30 – July 4 2014  
Conference Co-Organizer (with A. Ardekani, Y. Renardy, J. Zhang, E. Lauga), “Active Fluids: Bridging Complex Fluids and Biofluids,” 2014 Winter Conference, Aspen Center for Physics, Aspen, CO, January 27 – February 1 2014  
Symposium Co-Organizer (with A. Khair), “Electrohydrodynamics and Electrokinetics of Fluid Systems,” 50th Annual Technical Meeting of the Society of Engineering Science, Providence, RI, July 28–31, 2013  
Symposium Organizer, “Dynamics and Rheology of Complex Fluids”, 47th Annual Technical Meeting of the Society of Engineering Science, Ames, IA, October 4–6 2010  
Symposium Co-Organizer (with J. Bławdziewicz), “Complex Multiphase Flows”, 2009 Annual meeting of the American Institute of Chemical Engineers, Nashville, TN, November 8–13 2009

## REVIEWER FOR ARCHIVED JOURNALS

Analytical Chemistry (2009), Applied Physics Letters (2014), Biomicrofluidics (2016), Biophysical Journal (2013), Chemical Engineering Communications (2008), Chemical Engineering Science (2012), Cytoskeleton (2019), eLife (2018, 2020), European Journal of Mechanics B/Fluids (2012), European Journal of Physics (2012), European Physical Journal (2015), Europhysics Letters (2016), Experimental Mechanics (2009), Experiments in Fluids (2010), IMA Journal of Applied Mathematics (2017), Journal of Chemical Physics (2011, 2015, 2018), Journal of Computational Physics

(2005, 2009–2011, 2013–2016, 2018, 2019), Journal of Fluids Engineering (2006), Journal of Fluid Mechanics (2005–2021), Journal of Fluids and Structures (2013, 2014–2016), Journal of Nonlinear Science (2008, 2014, 2015), Journal of Non-Newtonian Fluid Mechanics (2005, 2006), Journal of Plankton Research (2013), Journal of Rheology (2009, 2012, 2016, 2017), Journal of the Royal Society Interface (2009), Langmuir (2010, 2012, 2014, 2015, 2018, 2019), Macromolecules (2009), Mechanics Research Communications (2011), Multiscale Modeling and Simulation (2012), Nanoscale (2015), Nature (2013), Nature Communications (2017, 2018), Nature Physics (2018), New Journal of Physics (2010, 2013, 2018), Physics of Fluids (2007–2015), Physical Review E (2007–2014), Physical Review X (2016), Physical Review Fluids (2016–2021) Physical Review Letters (2007–2013, 2015–2017), Proceedings of the National Academy of Science of the USA (2014, 2015, 2017, 2019, 2020, 2021), Proceedings of the Royal Society A (2009,2019), Quarterly Journal of Mechanics and Applied Mechanics (2010), Reviews of Modern Physics (2010), Rheologica Acta (2014, 2016), Science (2016), Scientific Reports (2015), Soft Matter (2011, 2012, 2015–2017, 2019, 2020), SIAM Journal on Applied Dynamical Systems (2011), SIAM Journal on Applied Mathematics (2014), SIAM Journal on Scientific Computing (2018).

## INTERNAL SERVICE

### At the University of California San Diego:

Member, MAE Graduate Admissions Committee, 2020 – Present

Member, MAE Space Committee, 2020 – Present

Chair, Ad Hoc Committee for Faculty Search in Biomechanics, 2019

Member, MAE Policies and Bylaws Committee, 2017 – 2020

Organizer, Biomechanics and Mechanobiology Seminar series, Fall 2014, Fall 2015, Spring 2020

Member, Penner Lecture Committee, 2017 – 2019

Organizer, Fluid Mechanics and Combustion Seminar series, Winter 2015, Fall 2017, Fall 2018

Departmental TA Advisor, Mechanical and Aerospace Engineering, 2016 – Present

Vice-Chair of the Graduate Affairs Committee, Mechanical and Aerospace Engineering, 2016 – 2017

Member of the External Affairs Committee, Mechanical and Aerospace Engineering, 2014 – Present

Member of the Undergraduate Affairs Committee, Mechanical and Aerospace Engineering, 2014

### At the University of Illinois at Urbana-Champaign:

Member of the Departmental Advisory Committee, Mechanical Science and Engineering Department, 2011 – 2013

Member of the Departmental Seminar Committee, Mechanical Science and Engineering Department, 2008 – 2013

Member of the Communications Advisory Group, Mechanical Science and Engineering Department, 2011 – 2012

Member of the Fellowship Committee, University of Illinois Computational Science and Engineering Program, 2009

## PH.D. DISSERTATION COMMITTEES

### At the University of California San Diego:

Heng Liu, Department of Structural Engineering

Brian Yamashiro, Department of Structural Engineering

Jennifer Lawrence, Department of Mechanical and Aerospace Engineering

Channing Prend, Scripps Institution of Oceanography

Anindita Bhattacharya, Department of Mechanical and Aerospace Engineering

Ritvik Vasan, Department of Mechanical and Aerospace Engineering

Haleh Halimohamadi, Department of Mechanical and Aerospace Engineering

Adam Weiss, Department of Mechanical and Aerospace Engineering

Qingyang Wang, Department of Mechanical and Aerospace Engineering

Shuai Zhang, Department of Mechanical and Aerospace Engineering

Ching Chang, Department of Mechanical and Aerospace Engineering (defended 2020)

Sungwon Lee, Department of Mechanical and Aerospace Engineering (defended 2020)

Ernesto Criado Hidalgo, Department of Mechanical and Aerospace Engineering (defended 2020)

Alexandra Vandine, Department of Mechanical and Aerospace Engineering (defended 2019)

Bei Fan, Department of Mechanical and Aerospace Engineering (defended 2019)

Benjamin Ciotti, Department of Mathematics (defended 2019)

Erica Rosenblum, Scripps Institution of Oceanography (defended 2018)

Edward Ronan, Department of Physics (defended 2018)  
Bryce G. Inman, Scripps Institution of Oceanography (defended 2018)  
Daniel Moreno Boza, Department of Mechanical and Aerospace Engineering (defended 2017)  
Bengu Ozge Akyurek, Department of Mechanical and Aerospace Engineering (defended 2017)  
Jixing Li, Department of Nanoengineering (defended 2017)  
Josh Villanueva, Department of Nanoengineering (defended 2016)  
Bowen Ling, Department of Mechanical and Aerospace Engineering (defended 2016)  
Soren Taverniers, Department of Mechanical and Aerospace Engineering (defended 2016)  
Cecily Keppel, Department of Mechanical and Aerospace Engineering (defended 2016)  
Manuel Gómez-González, Department of Mechanical and Aerospace Engineering (defended 2015)

**At the University of Illinois at Urbana-Champaign:**

Cheng Wang, Department of Mechanical Science and Engineering (defended 2013)  
Myungeun Suk, Department of Mechanical Science and Engineering (defended 2013)  
Reetesh Ranjan, Department of Mechanical Science and Engineering (defended 2012)  
Eakkachai Pengwang, Department of Mechanical Science and Engineering (defended 2011)  
Adam M. Willis, Department of Mechanical Science and Engineering (defended 2011)  
Amir H. G. Isfahani, Department of Mechanical Science and Engineering (defended 2011)  
Andrew J. Dorgan, Department of Aerospace Engineering (defended 2009)

**At other institutions:**

Nicolas Desreumaux, ESPCI, Paris, France (defended 2015) (rapporteur)  
Nawal Quennouz, ESPCI, Paris, France (defended 2013) (rapporteur)

## IMPROVEMENT ACTIVITIES

ASEE National Effective Teaching Institute Workshop (NETI-1B), Tampa, FL, January 4–6, 2013.  
NSF Short Course on Mechanics of Soft Materials, Northwestern University, Evanston, IL, May 10–12, 2010.  
NSF CAREER Proposal Writing Workshop, Georgia Institute of Technology, Atlanta, GA, March 25–26, 2010.

## CURRENT FUNDING

**National Science Foundation Division of Engineering** (CBET-1934199), Co-I (with E. Yariv, Technion, Israel), “NSF–BSF: From microscopic propulsion to macroscale dynamics: Active particle transport in complex environments,” 2019 – 2022, \$303,297.

**National Science Foundation Division of Engineering** (CMMI-1762566), Co-I (with A. Zidovska and M. J. Shelley, New York University) “Collaborative Research: Interphase Chromatin as a Complex Active Fluid: Experiments and Microscopic to Mesoscopic Modeling,” 2018 – 2021, \$300,000.

**National Science Foundation Division of Engineering** (CBET-1705377), Co-I (with P. M. Vlahovska and M. J. Miksis, Northwestern University) “Collaborative Research: Electrorotational Fluid Instabilities,” 2017 – 2020, \$199,932.

## COMPLETED FUNDING

**National Science Foundation Division of Mathematical Sciences** (DMS-1463965), Co-I (with M. J. Shelley, L. Reistroph and J. Zhang, Courant Institute) “Collaborative Research: Understanding and controlling active fluids through modeling, simulation, and experiment,” 2015 – 2018, \$187,500.

**National Science Foundation Division of Engineering CAREER Award** (CBET-1150590), PI, “Electrokinetic transport of fluid, particles, and macromolecules through nanochannels and nanopores,” 2012 – 2017, \$407,752.

**American Chemical Society Petroleum Research Fund** (ACS PRF #53240-ND9), PI, “Nonlinear electrohydrodynamics of emulsions in strong electric fields,” 2013 – 2015, \$100,000.

**National Science Foundation Division of Engineering** (CBET-1440106), PI, “Travel support for students and young researchers to attend ‘Flowing Soft Matter: Bridging the Gap Between Statistical Physics and Fluid Mechanics’ in Udine, Italy”, 2014, \$20,000.

**Projet International de Collaboration Scientifique, CNRS-UIUC, Co-I** (with E. Guazzelli, L. Bergounoux and M. Nicolas, CNRS Marseille), “Experimental and numerical study of finite-inertia effects in sedimenting suspensions,” 2011 – 2013, \$20,000.

**University of Illinois Research Board, PI**, “A novel computational model for short semiflexible polymers under strong confinement,” 2011 – 2013, \$15,320.

**National Science Foundation Division of Mathematical Sciences (DMS-0920931-ARRA), Co-I** (with M. J. Shelley, Courant Institute), “Collaborative Research: The analysis and simulation of biologically active suspensions,” 2009 – 2012, \$290,403.

**Lawrence Livermore National Laboratory Subcontract, Department of Energy (DOE-B583843), PI**, “Model development for electrophoretic deposition process,” 2009 – 2013, \$171,000.

**Center for Compact and Efficient Fluid Power, A National Science Foundation Engineering Research Center, PI**, “Nanoscale additives for pump performance: a computational study of carbon nanotube rheology,” 2010 – 2011, \$25,000.

**Arnold O. Beckman Award, University of Illinois Research Board, PI**, “Electrochemical transport and diffuse charge dynamics in nanoscale devices,” 2010 – 2011, \$21,268.

Welcome to the Saintillan Research Group! Our research centers on the study of fundamental fluid mechanics problems involving complex fluids and complex flows, typically on small scales. We use a combination of modeling, theory, and numerical simulations to study the dynamics and properties of flows involving a microstructure (such as particles... Electrohydrodynamics of viscous drops in strong electric elds: Numerical simulations. Debasish Das and David Saintillan, Department of Mechanical and Aerospace Engineering, University of California San Diego, 9500 Gilman Drive, La Jolla, CA 92093, USA. (Received xx; revised xx; accepted xx). David Saintillan is an Assistant Professor of Mechanical Science and Engineering at the University of Illinois at Urbana-Champaign. He received a B.S. in Engineering from Ecole Polytechnique, France, in 2001, and an M.S. and a Ph.D. in Mechanical Engineering from Stanford University in 2003 and 2006. He then worked as a Junior Research Scientist at the Courant Institute of Mathematical Sciences of New York University before joining the University of Illinois in 2008. View all. Follow. David Saintillan. Mechanical and Aerospace Engineering, University of California San Diego. Verified email at ucsd.edu - Homepage. KA Rose, B Hoffman, D Saintillan, ESG Shaqfeh, JG Santiago. Physical Review E 79 (1), 011402, 2009. 61. 2009. The sedimentation of flexible filaments. L Li, H Manikantan, D Saintillan, S Spagnolie. Journal of Fluid Mechanics 735, 705-736, 2013. 57. David Santillan. wiki follow. ID# 225684.