

## Vitae of Blair Perot

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### EMPLOYMENT

- Professor** University of Massachusetts, Amherst, MA (2009 - Present).  
Department of Mechanical and Industrial Engineering  
and Graduate School of Marine Sciences and Technology
- Visiting Professor** Delft University of Technology, Netherlands (2010 - 2011).  
Multi-Scale Physics Department.
- Associate Professor** University of Massachusetts, Amherst, MA (2003 - 2009).  
Department of Mechanical and Industrial Engineering  
and Graduate School of Marine Sciences and Technology
- Visiting Professor** Delft University of Technology, Netherlands (2003 - 2004).  
Applied Mathematics Department.
- Assistant Professor** University of Massachusetts, Amherst, MA (1997 - 2003).  
Department of Mechanical and Industrial Engineering
- Founder** Aquasions Inc., Canaan, NH. (1995 - Present).  
Software Development.
- Staff Scientist** Los Alamos National Laboratory, Los Alamos, NM. (1994 - 1995).  
T3 Group, Fluid Dynamics.

### EDUCATION

- Stanford University, Ph.D.** Mechanical Engineering, January 1994.  
Dissertation: "Shear-Free Turbulent Boundary Layers".  
Ph.D. Minor: **Computer Science**: Parallel Architectures and Algorithms.
- Stanford University, M.S.E.** Mechanical Engineering, June 1989.  
Research: "Coherent Structures in Near Wall Turbulence".
- Princeton University, B.S.E. with Highest Honors**, Aerospace Engineering, June 1987.  
Senior Thesis: "A Method for Determining the Dimension of Chaotic Systems".  
Minor: **Physics**.

### HONORS & AWARDS

- N.W.O. Visiting Professor*, Delft University of Technology, 2010-2011  
*Professor of the Year*, ASME Student Society, 2008, 2010, 2018.  
*J.M. Burgers Visiting Professor*, Delft University of Technology, Netherlands, 2003-2004  
*Lilly Fellowship*, Center for Teaching, 2002-2003.  
*Joseph Goldstein Award for Outstanding Junior Faculty*, University of Massachusetts, 2002.  
*College Outstanding Teacher Award*, University of Massachusetts, 2002.  
*STEMTEC Fellow*, Five Colleges, 2002.  
*College Outstanding Advisor Award*, University of Massachusetts, 2000.  
*Terman Graduate Fellowship*, Stanford University, 1988-1989.  
*Summa Cum Laude* (Highest Honors), Princeton University, 1987.  
*Phi Beta Kappa*, National Honor Society, Princeton University, 1987.  
*Tau Beta Pi*, Engineering Honor Society, Princeton University, 1986.

## PATENTS

1. Kaustubh Rao and Blair Perot, *Convergence Estimation Of Non-Linear PDE And Linear Solvers*, US 20170185707 A1. Docket No. 4412.1027-000, Filed December 2015. European Patent. Issued June 2017
2. Martin Sanchez-Rocha and Blair Perot, *Optimal Pressure-Projection Method for Incompressible Transient and Steady-State Navier-Stokes Equations*, US 201514981263. Filed January 2016. European Patent
3. Jai Gupta, Nihar Athreyas, Abbie Mathew, Blair Perot, *Analog co-processor*, WO 2017139342 A1, Filed February 2017, PCT/US2017/016955. US Patent (granted February 26, 2109, 10216703)  
Patent number 17706362.5-1221, filed September 14, 2018, European Patent.
4. Shujaut Bader and Blair Perot, *Wind Turbine Airfoil Structure for Increasing Wind Farm Efficiency*, US Patent, Ref. No. UMA 17-023 - SLW Ref. No. 3724.037US1 Patent Application Serial No.: 16/288,976, filed February 28, 2019.

## JOURNAL AND BOOK PUBLICATIONS

1. J. B. Perot, C. Chartrand, *A Mimetic Method for Polygons*, Journal of Computational Physics, Accepted, Sept 2020. doi.org/10.1016/j.jcp.2020.109853
2. J. B. Perot, M. Sanchez-Rocha, P. Malan: *A Fractional-Step Method for Steady-State Flow*, Journal of Computational Physics, **403**, 2020, doi.org/10.1016/j.jcp.2019.109057
3. V. Inguva, R. Graceffa, J. Schulz, O. Bilsel, J. B. Perot, *Creating round focused micro-jets from rectangular nozzles*, Journal of Mechanical Science and Technology (2019) 33(9): 4281-4289. 2019, doi.org/10.1007/s12206-019-0824-x
4. V. Inguva; J. P. Rothstein; J. B. Perot, *High-speed velocimetry in microfluidic protein mixers using confocal fluorescence decay microscopy*, Experiments in Fluids, **59** (12), 117, 2018. doi.org/10.1007/s00348-018-2630-0
5. S. Bader, V. Inguva, and J. B. Perot, *Improving the Efficiency of Wind Farms via Wake Manipulation*, Wind Energy, 2018. <https://doi.org/10.1002/we.2226>
6. V. Inguva, S. V. Kathuria O. Bilsel and J. B. Perot, *Computer Design of Microfluidic Mixers for Protein/RNA Folding Studies*, Plos One, 2018. doi.org/10.1371/journal.pone.0198534
7. N. Athreyas, W. Song, J.B. Perot, Q. Xia, A. Mathew, J. Gupta, J Yang, *Memristor-CMOS Analog Co-Processor for Acceleration of High Performance Computing Applications*, ACM Journal on Emerging Technologies in Computing (JETC), **14** (3), 1-30, 2018. doi: 10.1145/3269985
8. K. Rao, P. Malan, J. B. Perot, *A Stopping Criterion for the Iterative Solution of Partial Differential Equations*. Journal of Computational Physics, **352**, 265-284, 2017. doi: 10.1016/j.jcp.2017.09.033
9. Y. Song and J. B. Perot, *CFD Simulation of the NREL Phase VI Rotor*, Wind Engineering, 39 (3), 299–310, 2015. doi: 10.1260/0309-524X.39.3.299
10. T. P. Eiting, J. B. Perot, E. R. Dumont, *How much does nasal cavity morphology matter? Patters and rates of olfactory airflow in phyllostomid bats*, Proceedings of the Royal Society B – Biological Sciences, 7:282 (1800) :20142161, 2015. doi: 10.1098/rspb.2014.2161.
11. B. Koren, R. Abgrall, P. Bochev, J. Frank and J. B. Perot *Physics-compatible Numerical Methods*, Journal of Computational Physics, **257** B, 1039-1526, 2014, doi: 10.1016/j.jcp.2013.10.015
12. C. J. Zusi and J. B. Perot, *Simulation and Modeling of Turbulence Subjected to a Periods of Axisymmetric Contraction or Expansion*, Physics of Fluids, 26, 115103, 2014; <http://dx.doi.org/10.1063/1.4901188>

13. T.P. Eiting, T. D. Smith, J. B. Perot and E. R. Dumont, *The Role of the Olfactory Recess in Olfactory Airflow*, Journal of Experimental Biology, **217** (10), 1799-1803, 2014, doi:10.1242/jeb.097402
14. J. B. Perot and C. J. Zusi, *Differential Forms for Scientists and Engineers*, Journal of Computational Physics, **257B**, 1373–1393, 2014. doi: 10.1016/j.jcp.2013.08.007
15. C. J. Zusi and J. B. Perot, *Simulation and Modeling of Turbulence Subjected to a Period of Uniform Plane Strain*, Physics of Fluids, **25**, 110819, 2013, doi: 10.1063/1.4821450
16. S.V. Kathuria, A. Chan, R. Graceffa, R. Nobrega, C. R. Matthews, T. C. Irving, J. B. Perot, O. Bilsel, *Advances in turbulent mixing techniques to study microsecond protein folding reactions*. Biopolymers, **99** (11), 888-896, 2013. doi: 10.1002/bip.22355
17. A. Khajeh-Saeed, and J. B. Perot, *Direct Numerical Simulation of Turbulence Using GPU Accelerated Supercomputers*, Journal of Computational Physics, **235**, 241-257, 2013. doi:10.1016/j.jcp.2012.10.050
18. M. B. Martell and J. B. Perot, *The Oriented-Eddy Collision Turbulence Model*, Flow Turbulence and Combustion, **89** (3), 335-359, 2012. doi: 10.1007/s10494-012-9395-y
19. A. Khajeh-Saeed, and J. B. Perot, *Computational Fluid Dynamics Simulations using Many Graphics Processors*, Computing in Science and Engineering, **14** (3), 10-19, 2012. Doi: doi.ieeecomputersociety.org/10.1109/MCSE.2011.117
20. J. B. Perot, *Determination of the Decay Exponent in Mechanically Stirred Isotropic Turbulence*, Advances in Physics, **1**, 022104, 2011.
21. J. B. Perot, *Discrete Conservation Properties of Unstructured Mesh Schemes*, Annual Reviews of Fluid Mechanics, **43**, 299–318, 2011.
22. A. Khajeh-Saeed and J. B. Perot, *Chapter 13: GPU-Supercomputer Acceleration of Pattern Matching*, GPU Computing Gems, Emerald Edition, Wen-mei Hwu editor, Elsevier Inc, pp 185-198, 2011.
23. M. Martell, J. Rothstein & J. B. Perot, *An Analysis of Super-hydrophobic Turbulent Drag Reduction Mechanisms using Direct Numerical Simulation*, Physics of Fluids, **22**, 065102, 2010. doi.org/10.1063/1.3432514
24. A. Khajeh-Saeed, S. Poole & J. B. Perot, *Acceleration of the Smith-Waterman Algorithm using Single and Multiple Graphics Processors*, Journal of Computational Physics, **229** (11) 4247-4258, 2010.
25. J. B. Perot & J. Gadebusch, *A Stress Transport Equation Model for Simulating Turbulence at any Mesh Resolution*. Theoretical and Computational Fluid Dynamics. **23** (4), 271-286, 2009.
26. M. Martell, J. B. Perot & J. Rothstein, *Direct Numerical Simulation of Turbulent Flow over Drag-Reducing Ultrahydrophobic Surfaces*, Journal of Fluid Mechanics, **620**, 31-41, 2009.
27. J. B. Perot & J. Gadebusch, *A Self-adapting Turbulence Model for Flow Simulation at any Mesh Resolution*, Physics of Fluids, **19** (11), 115105, 2007.
28. J. B. Perot and V. Subramanian, *A Discrete Calculus Analysis of the Keller Box Scheme and a Generalization of the Method to Arbitrary Meshes*, Journal of Computational Physics, **226** (1), 494-508, 2007.
29. J. B. Perot and V. Subramanian, *Discrete Calculus Methods for Diffusion*, Journal of Computational Physics, **224** (1), 59-81, 2007.
30. J. B. Perot & S. de Bruyn Kops, *Modeling Turbulent Dissipation at Low and Moderate Reynolds Numbers*, Journal of Turbulence. **7** (69), 1-14, 2006.
31. V. Subramanian & J. B. Perot, *Higher-Order Mimetic Methods for Unstructured Meshes*, Journal of Computational Physics, **219** (1), 68-85, 2006.
32. J. B. Perot, D. Vidovic and P. Wesseling, *Mimetic Reconstruction of Vectors*, Compatible Spatial Discretizations, IMA Volumes in Mathematics and its Applications, Volume 142: Editors: D. N.

- Arnold, P. B. Bochev, R. B. Lehoucq, R. A. Nicolaides, and M. Shashkov, Springer, New York, pp 173-188, 2006. doi.org/10.1007/0-387-38034-5\_9
33. J. B. Perot & C. Chartrand, *Modeling Return to Isotropy Using Kinetic Equations*, Physics of Fluids. **17** (3), 2005.
  34. J. Ou, J. B. Perot and J. Rothstein, *Laminar Drag Reduction in Microchannels Using Ultrahydrophobic Surfaces*, Virtual Journal of Nanoscale Science & Technology. **10** (21), 2004.
  35. J. B. Perot & S. Natu, *A Model for the Dissipation Tensor in Inhomogeneous and Anisotropic Turbulence*, Physics of Fluids. **16** (11), 4053-4065, 2004.
  36. J. Ou, J. B. Perot and J. Rothstein, *Laminar Drag Reduction in Microchannels Using Ultrahydrophobic Surfaces*, Physics of Fluids, **16** (12), 4635-4643. 2004.
  37. F. Giraldo & J. B. Perot, *A Spectral Element Semi-Lagrangian Method for the Spherical Shallow Water Equations*, Journal of Computational Physics. **190** (2), 623-650, 2003.
  38. S. Are, X. Zhang & J. B. Perot, *Application of the Turbulent Potential Model to Unsteady Flows and Three-Dimensional Boundary Layers*, International Journal of Rotating Machinery, **9** (5), 375, 2003. <http://dx.doi.org/10.1155/S1023621X03000356>
  39. J. B. Perot & R. Nallapati, *A Moving Unstructured Staggered Mesh Method for the Simulation of Incompressible Free-Surface Flows*, Journal of Computational Physics, **184**, 192-214, 2003.
  40. M. Dai, H. Wang, J. B. Perot, and D. P. Schmidt, *Direct Interface Tracking of Droplet Deformation*, Atomization and Sprays, **12**, 721-735, 2002.
  41. C Wang and J. B. Perot, *Prediction of Turbulent Transition in Boundary Layers Using the Turbulent Potential Model*, Journal of Turbulence, **3**, 022, 2002.
  42. W. Chang, F. Giraldo & J. B. Perot, *Analysis of an Exact Fractional Step Method*, Journal of Computational Physics, **179**, 1-17, 2002.
  43. X. Zhang, D. Schmidt and J. B. Perot, *Accuracy and Conservation Properties of a Three-Dimensional Unstructured Staggered Mesh Scheme for Fluid Dynamics*, Journal of Computational Physics, **175**, 764-791, 2002.
  44. J. B. Perot, *Conservation Properties of Unstructured Staggered Mesh Schemes*, Journal of Computational Physics, **159** (1), 58-89, 2000.
  45. J. B. Perot, *Turbulence Modeling Using Body Force Potentials*, Physics of Fluids, **11** (9), 1999.
  46. J. B. Perot, *Comments on the Fractional Step Method*, Journal of Computational Physics, **121**, 1995.
  47. J. B. Perot and P. Moin, *Shear-Free Turbulent Boundary Layers, Part II: New Concepts for Reynolds Stress Transport Equation Modeling of Inhomogeneous Flows*, Journal of Fluid Mechanics, **295**, 1995.
  48. J. B. Perot and P. Moin, *Shear-Free Turbulent Boundary Layers, Part I: Physical Insights into Near Wall Turbulence*, Journal of Fluid Mechanics, **295**, 199-227, 1995.
  49. J. B. Perot, *An Analysis of the Fractional Step Method*, Journal of Computational Physics, **108** (1), 1993.
  50. P. Bradshaw and J. B. Perot, *A Note on the Turbulent Dissipation Rate in the Viscous Wall Region*, Physics of Fluids A, **5** (12), 1993.

### Conference Publications & Presentations

1. N. Athreyas, Qiangfei Xia, D. Gupta, W. Song, , J Yang, J.B. Perot, J. Gupta, *Memristor-CMOS Analog Co-Processor for Acceleration of High Performance Computing Applications*, Conference: 2018 International Conference on Current Trends towards Converging Technologies, March 2018. doi: 10.1109/ICCTCT.2018.85511153269985

2. C. Chartrand and J. B. Perot, *A New Hybrid Particle-Mesh Approach for Incompressible Fluid Dynamics*, 13th World Congress on Computational Mechanics (WCCM XIII), New York, NY July 2018. [http://www.wccm2018.org/sites/default/files/WCCM\\_Abstracts\\_A-D.pdf](http://www.wccm2018.org/sites/default/files/WCCM_Abstracts_A-D.pdf)
3. O. Bilsel, S. Chakravarthy, S. Kathuria, V Inguva, J.B. Perot, T Irving, Time-resolved SAXS using continuous-flow microfluidic mixers, *Acta Crystallographica Section A: Foundations and Advances* 74(a1):a449-a449.
4. J. B. Perot, The Keller-Box Scheme: A Mimetic Method that is a Bit Different, *Connections in Geometric Integration and Structure-Preserving Discretization*, BIRS Conference. Banff, Canada, June 2017, <https://open.library.ubc.ca/cIRcle/collections/48630/items/1.0361979>.
5. V. Inguva, J. B. Perot S. Kathuria, O. Bilsel, *High Speed Velocimetry and Concentration Measurements in Microfluidic Mixers Using Fluorescence Confocal Microscopy*, 69<sup>th</sup> Meeting of the American Physics Society Division of Fluid Dynamics, Portland, Or, Nov 2016.
6. J. B. Perot, *Superhydrophobic Drag Reduction*, *American Physics Society New England Meeting, Invited Plenary Speaker, April 2016*.
7. V. Inguva and J. B. Perot, *Design of an Efficient Turbulent Micro-Mixer for Protein Folding Experiments*, 68<sup>th</sup> Meeting of the American Physics Society Division of Fluid Dynamics, Boston, Nov 2015.
8. Nate DeVelder and J. B. Perot, *Turbulent Potential Model Predictions of High Re Flow Around the S809 Airfoil*, 68<sup>th</sup> Meeting of the American Physics Society Division of Fluid Dynamics, Boston, Nov 2015.
9. J. B. Perot and C. Zusi, *The Decay of Turbulence After it Stops Rotating*, 68<sup>th</sup> Meeting of the American Physics Society Division of Fluid Dynamics, Boston, Nov 2015.
10. T. P. Eiting, J. B. Perot, E. R. Dumont, *Smelling the difference: How do the size and shape of the olfactory recess relate to olfactory airflow?* Annual Meeting of the Society-for-Integrative-and-Comparative-Biology; January, 2014
11. N. deVelder and J. B. Perot, *Turbulent Potential Model Predictions of High Re Flow Around the S809 Airfoil*, 68<sup>th</sup> Meeting of the American Physics Society Division of Fluid Dynamics, Boston, Nov 2015
12. J. B. Perot and J. Gadebusch, *Can Reynolds Stress Transport Models be Used for Large Eddy Simulation?* 15<sup>th</sup> European Turbulence Conference, Delft, Netherlands, August, 2015
13. J. B. Perot, *Mimetic Methods and Why They Are Better*, UMass Amherst High Performance Computing Seminar, Amherst, February, 2015.
14. T. P. Eiting, J. B. Perot, E. R. Dumont, *Smelling the difference: How do the size and shape of the olfactory recess relate to olfactory airflow?* *Integrative and Comparative Biology*, 54, E57, Dec. 2014.
15. J.B. Perot, *Numerical Investigation of the Decay Rate of Isotropic Turbulence*, 26<sup>th</sup> IUPAP Conference on Computational Physics, CCP2014, Boston MA, August 2014.
16. T. P. Eiting, T. D. Smith, J. B. Perot, E. R. Dumont, *The Extent of the Transverse Lamina and its Role in Olfactory Airflow*, International Congress of Vertebrate Morphology, Barcelona, Spain, July 2013.
17. J. B. Perot, *The Utility of Mimetic Methods for Computing Geophysical Flows*, 2<sup>nd</sup> Conference on Flow Problems in Oil and Gas Industry, Rotterdam, Netherlands, March 2013
18. J. B. Perot, *Is the Keller Box Scheme Mimetic?*, SIAM Conference on Computational Science and Engineering, Boston, MA February 2013.
19. T. P. Eiting, J. B. Perot, E. R. Dumont, *Nasal airway morphology and olfactory airflow in phyllostomid bats*, Society for Integrative and Comparative Biology Annual Meeting, San Francisco CA, January 2013.
20. C. Zusi and J. B. Perot, *Simulation of Homogeneous Turbulence Subjected to Plane Strain*, 65<sup>th</sup> Meeting of the American Physical Society, Division of Fluid Dynamics, San Diego, CA, November 2012.
21. J. B. Perot and C. Zusi, *Simulation and Modeling of Turbulence Subjected to Plane Strain*, Parviz 60<sup>th</sup> Birthday Workshop, San Diego CA, October 2012.
22. A. Khajeh-Saeed, S. Poole, J. B. Perot, *A Comparison of Multi-Core Processors on Scientific Computing Tasks*. InPar 2012: Innovative Parallel Computing, Foundations and Applications of GPU, Manycore, and Heterogeneous Systems, San Jose, CA, May 2012.
23. J. B. Perot, *Simulation and Modeling of the Decay of Anisotropic Turbulence: Distilling Order from Chaos*, NSF CBET Contractors Meeting Division of Fluid Dynamics, Baltimore, MD, May 2012.
24. A. Khajeh-Saeed and J. B. Perot, *Efficient Implementation of CFD Algorithms on GPU Accelerated Supercomputers*, GPU Technology Conference, San Jose, CA. May 2012.

<http://developer.download.nvidia.com/GTC/PDF/GTC2012/PresentationPDF/S0217-GTC2012-Implementation-GPU-Supercomputers.pdf>

25. J. B. Perot & M. Martell, *Drag Reduction Using Super Hydrophobic Surfaces*, Workshop: Simulation of Complex Flows: Large Scale DNS and LES of Gaseous and Two-phase Flows, Madrid, April 16-17th 2012. **(Invited)**
26. J. B. Perot & C. Zusi, *Determination of the Turbulent Decay Exponent*, 64<sup>th</sup> Meeting of the American Physical Society, Division of Fluid Dynamics, Baltimore, MD, November 2011.
27. A. Khajeh-Saeed & J. B. Perot, *Turbulence Simulation using many Graphics Processors*, 64<sup>th</sup> Meeting of the American Physical Society, Division of Fluid Dynamics, Baltimore, MD, November 2011.
28. M. Martell & J. B. Perot, *The Oriented-Eddy Collision Model*, 64<sup>th</sup> Meeting of the American Physical Society, Division of Fluid Dynamics, Baltimore, MD, November 2011.
29. C. Zusi & J. B. Perot, *Simulation of Homogeneous Turbulence Subjected to Plane Strain*, 64<sup>th</sup> Meeting of the American Physical Society, Division of Fluid Dynamics, Baltimore, MD, November 2011.
30. J. Blair Perot, *The Relationship Between Discrete Calculus Methods and Other Mimetic Approaches*, Woudschoten Conference, Zeist, Netherlands, Oct. 2011. **(Invited)**
31. J. Blair Perot, *Discrete Calculus Methods and Their Application to Fluid Dynamics*, Woudschoten Conference, Zeist, Netherlands, Oct. 2011. **(Invited)**
32. J. Blair Perot, Mike Martel, Chris Zusi, *Implementation of the Oriented-Eddy Collision Model in OpenFoam*, First Dutch OpenFoam Users Meeting, Delft, Netherlands, Nov. 2010. **(Invited)**
33. J. Blair Perot, *Development of the Oriented-Eddy Collision Model*, Office of Naval Research Contractors Meeting, Annapolis, MD, Sept 29<sup>th</sup>, 2010.
34. T. McGuinness and J. B. Perot *Parallel Graph Analysis and Adaptive Meshing using Graphics Processing Units*, 2010 Meeting of the Canadian CFD Society, Ottawa, Canada, May 2010.
35. Russell Tessier, Salma Mirza, and J. Blair Perot: *Reconfigurable Sparse Matrix-Vector Multiplication on FPGAs*. ERSAs 2010: 77-83, 2010.
36. N. Trask, J. Perot, and D. Schmidt, M. Lightfoot and S. Danczyk, *Modeling of the Internal Two- Phase Flow in a Gas- Centered Coaxial Fuel Injector*, 48th AIAA Aerospace Sciences Meeting, January, AIAA-2010-0095, 2010.
37. M. Martell & J. B. Perot, *Direct Numerical Simulations of Turbulent Flows over Superhydrophobic Surfaces*, 61<sup>st</sup> Meeting of the American Physical Society, Division of Fluid Dynamics, San Antonio, TX, November 2008.
38. M. Nilsson & J. B. Perot, *Wall Boundary Conditions for Two Point Correlations*, 61<sup>st</sup> Meeting of the American Physical Society, Division of Fluid Dynamics, San Antonio, TX, November 2008.
39. M. B. Martell, B. Perot and J. Rothstein. *DNS of Turbulent Channel Flow Past Ultrahydrophobic surfaces with Periodic Microfeatures*. 8th. World Congress on Computational Mechanics (WCCM8) 5th. European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS 2008), Venice, Italy, July 2008.
40. M. Martell & J. B. Perot, *DNS of Turbulent Channel Flow Past Ultrahydrophobic Surfaces with Periodic Microfeatures*, 60<sup>th</sup> Meeting of the American Physical Society, Division of Fluid Dynamics, Salt Lake City, UT, November 2007.
41. J. B. Perot & M. Nilsson, *Modeling Wall Blocking Effects*, 60<sup>th</sup> Meeting of the American Physical Society, Division of Fluid Dynamics, Salt Lake City, UT, November 2007.
42. J. B. Perot & S. Menon, *CFD Computations on Multi-GPU Configurations*, 60<sup>th</sup> Meeting of the American Physical Society, Division of Fluid Dynamics, Salt Lake City, UT, November 2007.
43. J. B. Perot, *Higher Order Discrete Calculus Methods*, 22nd Biennial Conference on Numerical Analysis, Dundee, Scotland, June 2007.
44. S. Menon & J. B. Perot, *Implementation of an Efficient Conjugate Gradient Algorithm for Poisson Solutions on Graphics Processors*, 2007 Meeting of the Canadian CFD Society, Toronto, Canada, June 2007.
45. J. Gadebusch & J. B. Perot, *Self-Adapting Turbulence Model for Hybrid RANS/LES*, 2007 Meeting of the Canadian CFD Society, Toronto, Canada, June 2007.



46. V. Subramanian & J. B. Perot, *On the Development of Discrete Calculus Methods*, 2007 Meeting of the Canadian CFD Society, Toronto, Canada, June 2007.
47. J. B. Perot & V. Subramanian, *Exact Fractional Step Methods for Solving the Incompressible Navier-Stokes Equations*, 2007 Meeting of the Canadian CFD Society, Toronto, Canada, June 2007.
48. J. Gadebusch & J. B. Perot, *A Self-Adapting Turbulence Model for Hybrid RANS/LES*, 59<sup>st</sup> Meeting of the American Physical Society, Division of Fluid Dynamics, Tampa, FL, November 2006.
49. J. B. Perot & S. Menon, *Using Graphics Processors for CFD*, 59<sup>st</sup> Meeting of the American Physical Society, Division of Fluid Dynamics, Tampa, FL, November 2006.
50. J. B. Perot, *An Oriented-Eddy Collision Model for Turbulence Prediction*, Office of Naval Research Contractors Meeting, Newport, RI, October, 2006.
51. J. B. Perot, *Large Eddy Simulation using a Transport Equation for the Subgrid Scale Stress Tensor*, Air Force Office of Scientific Research Integrated Meeting, Atlanta, GA, August, 2006.
52. A. Paschedag, J. B. Perot: *Treatment of surface tension in a flow solver for discontinuous two-phase systems* (Behandlung der Grenzflächenspannung in einem Strömungslöser für diskontinuierliche zweiphasige Systeme), Sitzung des GVC-Fachausschusses 'Computational Fluid Dynamics', 2. March 2006, Überlingen, Germany.
53. J. B. Perot & J. Gadebusch, *Using a RANS model to Perform LES of Isotropic Decaying Turbulence*, 58<sup>st</sup> Meeting of the American Physical Society, Division of Fluid Dynamics, Chicago, IL, November 2005.
54. J. B. Perot, *An Oriented Eddy Collision Model for Turbulence Prediction*, Office of Naval Research Contractors Meeting, Princeton, NJ, October 2005.
55. J. B. Perot & D. Schmidt, *Unstructured Adaptive Moving Mesh Solution of Unsteady Shear Flows and Free Surface Flows*, Proceedings of the 4th International Symposium on Turbulence and Shear Flow Phenomena, Williamsburg, VA, June 2005.
56. J. B. Perot, & C. Chartrand, *Eddy Collision Models for Turbulence*, Proceedings of the 6th International Conference on Turbulence Modeling and Measurements, Sardinia, Italy, May, 2005.
57. J. Ou, J. B. Perot & J. Rothstein, *Drag Reduction in Flows Past Ultrahydrophobic Surfaces*, 57<sup>st</sup> Meeting of the American Physical Society, Division of Fluid Dynamics, Seattle, WA, November 2004.
58. J. B. Perot & C. Chartrand, *Modeling Return to Isotropy as PDF Collision Process*, 57<sup>st</sup> Meeting of the American Physical Society, Division of Fluid Dynamics, Seattle, WA, November 2004.
59. J. Ou, J. B. Perot & J. Rothstein, *Laminar Drag Reduction in the Flow through Microchannels Using Ultrahydrophobic Surfaces*, 78th ACS Colloid and Surface Science Symposium, New Haven CT , June 2004.
60. J. B. Perot, *Compatible Reconstruction of Vectors*, Compatible Spatial Discretizations for Partial Differential Equations, Institute for Mathematical Applications Workshop, University of Minnesota, May 2004. (**Invited**).
61. J. Ou, J. B. Perot & J. Rothstein, *Laminar Drag Reduction in Microchannels Using Ultrahydrophobic Surfaces*, 56<sup>st</sup> Meeting of the American Physical Society, Division of Fluid Dynamics, New York, NY, November 2003.
62. J. B. Perot & D. Schmidt, *Solution of the Incompressible Navier-Stokes Equations using Moving Unstructured Staggered Mesh Methods.*, 56<sup>st</sup> Meeting of the American Physical Society, Division of Fluid Dynamics, New York, NY, November 2003.
63. J. B. Perot & D. Schmidt, *The Solution of Incompressible Flow Problems on Moving Staggered Meshes*, Mimetic Discretizations of Continuum Mechanics, San Diego, July, 2003.
64. J. B. Perot, *An Exact Projection Method*, Perspectives on Incompressible Flows: Comparison of Different Computational Strategies, University of Maryland, April 2003. (**Invited**).
65. J. B. Perot, *An Eddy Collision Model of Turbulence*, 55<sup>st</sup> Meeting of the American Physical Society, Division of Fluid Dynamics, Dallas, TX, November 2002.
66. J. B. Perot, S. Are, & . W. Chang, *Application of the Turbulent Potential Model to Complex Flows*, Proceedings of the 5th International Conference on Turbulence Modeling and Measurements, Mallorca, Spain, Sept, 2002.
67. M. Dai, B. Perot & D. Schmidt, *Heat Transfer Within Deforming Droplets*, ASME Internal Combustion Engine Division Technical Conference, New Orleans, LA, September 2002.

68. M. Dai, W. Hudong, J. B. Perot, and D. Schmidt, *A Numerical Method for Interface Tracking*, 15<sup>th</sup> ILASS Meeting, Madison, WI, May, 2002.
69. J. B. Perot, S. Are, X. Zhang, *Application of the Turbulent Potential Model to Unsteady Flows and Three-Dimensional Boundary Layers*, 9<sup>th</sup> International Symposium on Transport Phenomena and Dynamics of Rotating Machinery, Honolulu, HA, February 2002.
70. J. B. Perot, *Development of an Eddy Collision Model of Turbulence*, 54<sup>st</sup> Meeting of the American Physical Society, Division of Fluid Dynamics, San Diego, CA, November 2001.
71. W. Chang & J. B. Perot, *Modeling Transition to Turbulence using the Turbulent Potential*, 54<sup>st</sup> Meeting of the American Physical Society, Division of Fluid Dynamics, San Diego, CA, November 2001.
72. J. B. Perot & X. Zhang, *The Development of an Adaptive Moving Unstructured Staggered Mesh Method for Incompressible Flows*. 19<sup>th</sup> Biennial Numerical Analysis Conference, Dundee, Scotland, June 2001.
73. M. Dai, B. Perot & D. Schmidt, *New Numerical Methods for Interface Tracking in Two-Phase Flow*, 14<sup>th</sup> Annual Conference on Liquid Atomization and Spray Systems, Dearborn, MI, May 2001.
74. J. B. Perot & R. Nallapati, *The Application of a Moving Unstructured Staggered Mesh Method to Free-Surface Flows*, 53<sup>st</sup> Meeting of the American Physical Society, Division of Fluid Dynamics, Washington, DC, November 2000.
75. A. Bhattacharya, J. B. Perot, *Modeling Rotating Turbulent Flows with the Body Force Potential Model*, 53<sup>st</sup> Meeting of the American Physical Society, Division of Fluid Dynamics, Washington, DC, November 2000.
76. R. Nallapati & J. B. Perot, *Numerical Simulation of Free-Surface Flows Using a Moving Unstructured Staggered Mesh Method*. ASME Fluid Engineering Summer Conference, Boston, MA, June, 2000. FEDSM2000-11255.
77. X. Zhang & J. B. Perot, *Unsteady Flow Prediction of Turbulent Flow Around a Triangular Cylinder*. ASME Fluid Engineering Summer Conference, Boston, MA, June, 2000. FEDSM2000-11172.
78. J. B. Perot & M. Ramanathpura, *Performance of a Potential Flow Solver Using PC Clusters*. ASME Fluid Engineering Summer Conference, Boston, MA, June, 2000. FEDSM2000-11223.
79. J. B. Perot & X. Zhang, *Potential Turbulence Model Prediction of Flow Around a Triangular Cylinder Using an Unstructured Staggered Mesh Method*, Proceedings of the Eighth Annual Conference of the Computational Fluid Dynamics Society of Canada, Montreal, June, 2000.
80. H.-S. Tsuei & J. B. Perot, *Turbomachinery Predictions Using the Turbulent Potential Model*, AIAA 2000-0135, Reno, Nevada, Jan, 2000.
81. J. B. Perot & J. Taupier, *Modeling Three-Dimensional Boundary Layers Using the Turbulent Potential Model*, AIAA 2000-0914, Reno, Nevada, Jan, 2000.
82. J. B. Perot *Conservation Properties of Unstructured Staggered Mesh Schemes*, 52<sup>st</sup> Meeting of the American Physical Society - Division of Fluid Mechanics, New Orleans, LA, Nov, 1999.
83. J. B. Perot *Turbulence Modeling using Body Force Potentials*, ONR Contractors Meeting, Stanford University, Stanford, CA, Sept, 1999.
84. J. B. Perot & X. Zhang, *Reformulation of the Unstructured Staggered Mesh Method as a Classic Finite Volume Method*, 2<sup>nd</sup> International Conference on Finite Volume Methods and Applications, Duisburg, Germany, July, 1999.
85. J. B. Perot & W. Hudong, *Modeling Separation and Reattachment Using the Turbulent Potential Model*, Proceedings of the 4<sup>th</sup> International Conference on Turbulence Modeling and Measurements, Corsica, France, May, 1999.
86. J. B. Perot, *Turbulence Modeling using Body Force Potentials*, 51<sup>st</sup> Meeting of the American Physical Society - Division of Fluid Mechanics, Philadelphia, PA, 1998.
87. W. Hudong & J. B. Perot, *Modeling Boundary Layers using the Turbulent Potential Model*, 51<sup>st</sup> Meeting of the American Physical Society - Division of Fluid Mechanics, Philadelphia, PA, 1998.
88. J. B. Perot & C. Zusi, *A New Approach to Turbulence Modeling*, NASA Phase I SBIR Report, August 1997.
89. J. B. Perot & P. Moin, *A New Approach to Turbulence Modeling*, CTR Summer Program Report -1996, Center for Turbulence Research, Stanford University, November 1996.



90. J. B. Perot & P. Moin, *A New Approach to Turbulence Modeling*, 49th Meeting of the American Physical Society - Division of Fluid Mech., November 24-26, 1996, Syracuse, NY.
91. J. B. Perot & P. Moin, *Modeling Shear-Free Turbulence*, Summer School on Turbulence and Transition Modeling, Stockholm, Sweden, June 10-20, 1995.
92. P. Malan, J. Johnston, & J. B. Perot, *Heat Transfer in a Shear-Free Turbulent Boundary Layer*, Proceedings of the 2<sup>nd</sup> International Symposium on Engineering Turbulence Modeling and Measurements, W. Rodi & F. Martelli, eds., Elsevier Publishers, Florence, Italy, June 1993,
93. J. B. Perot, *Direct Numerical Simulation of Turbulence on the Connection Machine*, Parallel Computational Fluid Dynamics '92, R. B. Pelz, A. Ecer & J. Hauser, eds., North-Holland, 1993.
94. J. B. Perot & P. Moin, *New Concepts for Reynolds Stress Transport Equation Modeling of Inhomogeneous Flows*, Annual Research Briefs, Center for Turbulence Research, Stanford University, 1993.
95. J. B. Perot, *Turbulence Simulation on the Connection Machine*, NAS Technical Summaries, NASA-Ames Research Center, 1993.
96. J. B. Perot & P. Moin, *A Near Wall Model for the Dissipation Tensor*, Eleventh Australasian Fluid Mechanics Conference, December 13-18, 1992, Hobart, Tasmania, Australia.
97. J. B. Perot & P. Moin, *Direct Numerical Simulation of the Shear-Free Turbulent Boundary Layer*, 44th Meeting of the American Physical Society - Division of Fluid Mech., Tempe, AZ. 1991.

## INVITED LECTURES

1. *Construction of Mimetic Numerical Methods*, Deltares, Netherlands, June 2013.
2. *Construction of Mimetic Numerical Methods*, Dassault Systemes, Providence RI, May 2013.
3. *An Approach to Higher-Order Mimetic Finite Volume Schemes*, Eindhoven University, Netherlands, March 2013.
4. *On the Decay of Isotropic Turbulence*, University of Illinois, Urbana-Champaign. Oct 2011.
5. *Discrete Calculus Analysis*, Aerospace Lecture Series, Delft University, Netherlands. June 2011.
6. *Discrete Calculus Analysis of the Keller Box Scheme*, CWI Seminar, Amsterdam, Netherlands, May 2011.
7. *Scientific Computation Using Graphics Processors* Los Alamos National Laboratory, Aug. 2009.
8. *Higher Order Discrete Calculus Method for Diffusion*, Los Alamos National Laboratory, Aug. 2009.
9. *Mimetic Discretization Methods for Incompressible Flow Problems on Moving Meshes*, MAS Scientific Computing Seminar, CWI, Amsterdam, Netherlands, June 2004.
10. *Mimetic Numerical Methods for Free-Surface Flows and Turbulence*, Delft Hydraulics, Netherlands, April 2004.
11. *Numerical Simulation of Two-Phase Flows*, Dept. of Multiscale Physics, Technical University of Delft, December 2003.
12. *Moving Mesh Methods for the Solution of the Navier-Stokes Equations*, Los Alamos National Laboratory, November 2003.
13. *Moving Unstructured Staggered Mesh Methods for Fluid Dynamics*, Applied Mathematics Dept, Technical University of Delft, September 2003.
14. *Development of an Eddy Collision Model of Turbulence*, Mechanical Engineering Seminar, California Institute of Technology, March 2003.
15. *Unstructured Staggered Mesh Methods*, Stanford University, Dept. of Mechanical Engineering, August 2001.
16. *Modeling Turbulence Using Turbulent Potentials*, Brown University, Applied Mathematics Seminar Series, February 2000.
17. *A New Approach to Turbulence Modeling*, Cornell University, Seminar Series on Turbulence and Transition Modeling, January 1999.
18. *Future Directions in CFD*, Small Turbine Design Conference, Concepts ETI, Vermont, May 1998.
19. *Turbulence Modeling Using Turbulent Potentials*, Stanford University, Center for Turbulence Research, October 1997.

20. *Advanced Turbulence Models: Theory & Implementation*, Concepts ETI Inc., Norwich, Vermont, September 1997.
21. *Shear-Free Turbulent Boundary Layers*, Royal Institute, Stockholm, Sweden, June, 1994.

### **SENIOR PERSONNEL SUPERVISED**

Anja Paschdag, Visiting Faculty, 2005.  
 Satoshi Yokojima, PostDoc, 2004-2005.

### **PH.D. STUDENTS ADVISED**

Xing Zhang,	Mech. Eng.	2002
Wang Chang	Mech. Eng.	2003
Wei Lui	Mech. Eng.	2004
Venkat Subramanian	Mech. Eng.	2007
Mike Martell	Mech. Eng.	2012
Ali Khajeh-Saeed	Mech. Eng.	2012
Chris Zusi	Mech. Eng.	2014
Nate DeVelder	Mech. Eng.	2018
Venkatesh Inguva	Mech. Eng.	2018
Chris Chartrand	Mech. Eng.	2019

### **MASTERS. STUDENTS ADVISED**

Hudong Wang	Mech. Eng.	1999
Ramesh Nallapti	Mech. Eng.	2000
Joris Taupier	Mech. Eng.	2001
Manju Ramanathpura	Mech. Eng.	2001
Sasanka Are	Mech. Eng.	2002
Amitahb Bhattacharya	Mech. Eng.	2002
Siddhatha Katoley	Mech. Eng.	2003
Sadbahw Natu	Mech. Eng.	2003
Chris Chartrand	Mech. Eng.	2004
Jason Gadebusch	Mech. Eng.	2007
Sandeep Menon	Mech. Eng.	2008
RaeAnn Mba	Mech. Eng.	2008
Mike Nilsson	Mech. Eng.	2008
Mike Martell	Mech. Eng.	2009
Dnyanesh Digaskar	Mech. Eng.	2009
Tim McGuinness	Mech. Eng.	2010
Yang Song	Mech. Eng.	2013
Barnali Paul	Mech. Eng.	2015
Shujaut Bader	Mech. Eng.	2017

### **UNDERGRADUATE HONORS STUDENTS ADVISED**

Tim Gordon	Mech. Eng.	2000
Nicole Nicoles	Mech. Eng.	2004
Michael Hayek	Mech. Eng.	2009
Dedi Setiadi	Mech. Eng.	2009
Alex Chan	Mech. Eng.	2013
Jared Detwiler	Mech. Eng.	2017
Amy Morin	Mech. Eng.	2018
Daniel Gadre	Mech. Eng.	2021

## RESEARCH GRANTS

<b>Dates</b>	<b>Agency</b>	<b>Title</b>
2020-2021 2019	DARPA Massachusetts Technology Transfer Center	<i>Template Library for Mimetic Physics Simulation Wind Turbine Power Augmenter.</i>
2017-2019	Department of Energy	<i>Sandia Special Degree Program contract DE- NA0003525</i>
2014-2018	National Science Foundation DBI-1353942	<i>Optimization of microsecond mixing devices for biological kinetics via simulation and experiment. With O. Bilsel, UMass Medical,</i>
2013-2017	National Science Foundation CBET-1336502	<i>Collaborative Research: Analysis and design of textured super-hydrophobic surfaces capable of preventing ice formation on wind turbine blades With M. Lackner,</i>
2010-2013	National Science Foundation CBET-1032364	<i>Simulation and Modeling of the Decay of Anisotropic Turbulence</i>
2008-2011	Department of Energy	<i>Implementation and Performance Testing of High Performance Computing Benchmarks on Coupled Graphics Processors.</i>
2008-2011	Office of Naval Research	<i>Application of the Oriented-Eddy Collision Model to Complex Turbulent Flows.</i>
2008	College of Engineering	<i>Development of a Supercomputing Facility for Undergraduate Research.</i>
2007	National Science Foundation	<i>REU Supplement: Predictive Turbulence Models for Computational Fluid Dynamics</i>
2005-2008	National Science Foundation	<i>Predictive Turbulence Models for Computational Fluid Dynamics.</i>
2004-2007	Office of Naval Research	<i>An Oriented Eddy Collision Model for Turbulence Prediction</i>
2004-2007	Air Force Office of Scientific Research	<i>Large Eddy Simulation using a Transport Equation for the Subgrid-Scale Stress Tensor</i>
2003-2004	Technical University Delft, Netherlands	<i>Burgers Center Faculty Fellowship</i>
2003-2004	National Science Foundation	<i>Direct Numerical Simulation of Turbulent Drop Dispersion SGER. With D. Schmidt,</i>
2002-2003	Air Force Office of Scientific Research	<i>Laminar Drag Reduction using Ultrahydrophobic Surfaces</i>
2001-2004	Office of Naval Research	<i>Development of an Eddy Collision Model of Turbulence</i>
2000-2001	Office of Naval Research	<i>DURIP: High Performance Parallel Computer for Research in Unsteady Turbulence Modeling, Large-Eddy Simulation and Advanced Numerical Methods.</i>
1999-2000	National Science Foundation	<i>MRI: Acquisition of a High-Performance Parallel Computer to Support an Interdisciplinary Computational Science Center for Physical Science. With Martin Weinberg, Astrophysics, .</i>
1999-2002	Air Force Office of	<i>Turbulence Modeling Using Turbulent Potentials</i>

1998-1999	Scientific Research University of Massachusetts	<i>Numerical Method for the Simulation of Free- Surface Flows</i>
1998-2001	Office of Naval Research	<i>Turbulence Modeling Using Body force Potentials</i>
1997-2000	Department of Energy	<i>An Energy and Momentum Conserving Numerical Scheme for Unstructured Meshes</i>
1997	NASA	<i>A New Approach to Turbulence Modeling</i>

## TEACHING ACTIVITIES

Class	Name	Semester	Rating*	Enrollment
MIE 113	Introduction to Engineering	S05	4.34	41
MIE 124	Problem Solving with Computers	S02	2.83	96
		S03	4.40	105
		S06	4.22	110
		S07	4.50	121
		S09	4.20	171
MIE 230	Thermodynamics	F04	4.47	82
		F06	4.24	104
		S08	4.66	65
		F11	4.50	181
		S13	4.70	52
MIE 310	Dynamics	S16	4.00	182
MIE 340	Fluid Dynamics	F97	4.83	24
		S98	4.73	24
		S99	4.80	38
		F02	4.86	46
		F09	4.50	87
		F11	4.40	121
		F12	4.80	145
		F13	4.40	172
		F15	4.30	178
		F16	4.70	191
		F17	4.40	202
MIE 354	Heat Transfer	S01	5.00	19
		F04	4.47	48
		S15	4.47	48
CC 391a	Chaos Theory	F13	4.10	12
MIE 440	Aerospace Fluid Dynamics	S00	5.00	11
		F07	4.83	12
MIE 597nm	Intro to Numerical Methods	F18		40
MIE 603	Numerical Methods	F01	4.37	24
		F02	3.90	10
		F08	4.30	24
		F09	4.50	24
		F13	4.40	27
		F15	4.10	22
		F16	4.40	19

MIE 604	Computational Fluid Dynamics	S09	4.30	13
		S13	4.40	11
		S18	4.60	15
MIE 607	Advanced Fluid Dynamics	F99	4.57	8
		S00	4.67	7
		S01	4.67	6
		F06	4.32	43
		F17	3.70	20
MIE 707	Viscous Flows	F98	4.00	6
		F00	4.67	5
		S15	4.67	5
MIE 821	Turbulence	S05	4.00	4
		S10	4.50	12
		S12	4.90	9
		S14	4.70	13
		S17	4.40	11

(\*Rating of Overall Instructor Teaching from SRTI evaluations, out of 5)

### **PROPOSAL REVIEW ACTIVITIES**

INCITE. Panel Reviewer, Fluid Dynamics (2014-17)

Dutch National Science Foundation. (2012, 2014)

XSEDE Supercomputing Resource Committee, standing member, 2011 – 2014. (4 times per year)

NSF Teragrid Supercomputing Resource Committee, standing member, 2009 – 2011. (4 times per year)

NSF Turbulence Panel, Fluid Dynamics (2012, 2014)

NSF Career Panel, Fluid Dynamics (2011)

NSF Interfacial Flows Panel. (2008).

NSF Applications for Petascale Computing Panel (2007).

NSF MRI Panel (2005).

NSF Information Technology (ITR) Panel (2003).

NSF, Reviewer for Division of Chemical and Transport Systems (2001, 2002).

### **JOURNAL REVIEW ACTIVITIES**

Reviewer for the *Journal of Computational Physics* (about 4 reviews a year).

Reviewer for *Physics of Fluids* (about 2 review per year).

Reviewer for the *Journal of Fluid Mechanics* (about 1 review a year).

Reviewer for the *Journal of Turbulence* (about 1 review per year).

Occasional reviews for *Journal of Fluids Engineering, Computers and Fluids, Journal of Atmospheric Sciences, Finite Elements in Analysis and Design, Journal of Applied Mechanics*.

### **SERVICE**

#### **Department**

Department Personnel Committee (5 years)

Dept. Head Search Committee (1 year)

Sigma Tau Pi Faculty Advisor (2 years)

Tau Beta Pi Faculty Advisor (2 years)

ASME Faculty Advisor (2 years)

Faculty Search Committee (4 years)

Graduate Committee (4 years)  
Undergraduate Committee (5 years)  
Strategic Planning Committee (1 year)  
Public Relations Committee (3 years)

### **College**

College Personnel Committee (3 years)  
Steering Committee for Industrial Engineering (3 years)  
College Information Technology Committee (3 years)

### **University**

Steering Committee, Center for Computational Science, College of Natural Science and Math. (3 years)  
Faculty Senator (2006- 2011)

### **Public**

Technical Advisor, Montshire Museum of Science, Norwich, Vermont  
Host for Amherst Middle School Laboratory Tours, 2005,2006,2013,2014.  
Industry Seminar on Computational Fluid Dynamics 4/99. Hanover, NH.  
Short Course in Turbulence Modeling, 2/98 Concepts ETI, Norwich, VT.  
Judge for the Regional High School Science Fair held at UMass, 1999, 2001.  
Princeton University Alumni Schools Committee.

### **MEMBERSHIP**

American Physical Society, Fluid Dynamics Division  
American Society of Mechanical Engineers (previous Faculty Advisor)  
Tau Beta Pi (previous Faculty Advisor)  
Phi Beta Kappa

### **CONSULTING**

Sciex, Toronto, CA, 2019-2021  
Spero Design, Providence, RI, 2015 - 2020  
Dassault Systemes, Providence, RI, 2013 - 2019  
ClearEdge Power, East Windsor, CT, 2013.  
WindPower Associates, Northfield, MA, 2006 - 2012.  
SkyYacht, Amherst MA, 2002 – 2011  
Ash Erosion Inc. Springfield, MA, 2005.  
MediaBlimp, Sacramento, CA, 2003.