

CURRICULUM VITAE

CHARLES MENEVEAU

Louis M. Sardella Professor, Department of Mechanical Engineering
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Birth Date: December 04, 1960 (Paris, France).

Education: Ph.D. in Mechanical Engineering: Yale University, May 1989
Master of Philosophy: Yale University, 1988
Master of Science: Yale University, 1987
B.S. in Mechanical Engineering: Universidad Técnica Federico Santa María, Valparaíso (Chile), 1985

Positions: 2005 – present: L.M. Sardella Professor of Mechanical Engineering, JHU
2009 – present: Associate Director, Institute for Data Intensive and Engineering Science (IDIES).
June-August, '13: Visiting Professor, EPFL Lausanne, Switzerland
May 2013: Visiting Professor, Università di Roma Tor Vergata, Italy
March-April '13: Visiting Professor, École Normale Supérieure de Lyon, France
2012 – Febr. '13: Visiting Professor, University of Melbourne, Australia
2001 –2012: Director, Center for Environmental and Applied Fluid Mechanics (CEAFM).
2016 – present: Secondary appointment in Department of Environmental Health and Engineering, JHU (EHE).
2001 – 2016: Secondary appointment in Department of Geography and Environmental Engineering, JHU (DoGEE).
2002 – 2004: Vice-Chair, Department of Mechanical Engineering
1996 – 2005: Professor, JHU
1999 – 2000: Visiting Professor, École Centrale de Paris, France
1994 – 1996: Associate Professor, Johns Hopkins University
1990 – 1994: Assistant Professor, Johns Hopkins University
1989 – 1990: Postdoctoral Fellow, Center for Turbulence Research (Stanford University / NASA Ames Research Center)
05-09 – 1989: Postdoctoral Fellow, Yale University
1986 – 1989: Research Assistant, Yale University.

Society Memberships:

- American Academy of Mechanics, Fellow.
- American Society of Mechanical Engineers, Fellow.
- American Physical Society, Fellow.
- Pi Tau Sigma, Honorary Member
- American Geophysical Union, Member.
- American Institute for Aeronautics and Astronautics, Senior Member.

Awards and Honors:

- Elected member, National Academy of Engineering (2018), *“for contributions to turbulence small-scale dynamics, large-eddy simulations, wind farm fluid dynamics, and leadership in the fluid dynamics community”*.
- Awarded honorary doctorate from the Danish Technical University, *Doctor Technicus, Honoris Causa* (2016) for *“Outstanding and highly innovative scientific achievements in fluid dynamics, particularly for his work on turbulence and atmospheric physics and its applications to wind energy”*.
- Midwest Mechanics Lecturer (2014-2015).
- Fulbright Scholar, US-Australia Fulbright Scholarship (Sept. 2012-Febr. 2013).
- Stanley Corrsin Lecturer, Johns Hopkins University (2012).
- First recipient of the Stanley Corrsin Award from the American Physical Society (2011), citation: *“For his innovative use of experimental data and turbulence theory in the development of advanced models for large-eddy simulations, and for the application of these models to environmental, geophysical and engineering applications.”*
- Foreign corresponding member of the Chilean Academy of Sciences (2005).
- Appointed to the Louis M. Sardella Professorship in Mechanical Engineering (2005).
- UCAR Outstanding Publication Award for co-authorship of the paper by Horst *et al.*, that appeared in J. Atmospheric Science in 2004.
- Johns Hopkins University Alumni Association Excellence in Teaching Award (2003).
- François N. Frenkiel Award for Fluid Mechanics, American Physical Society (2001).
- Henry P. Becton Prize for Excellence in Research, Yale University (1989).
- Premio Federico Santa María, UTFSM Valparaíso, Chile (1985).

Editorships and other professional synergistic activities:

- Deputy Editor, Journal of Fluid Mechanics (April 2010 - present).
- Chair-Elect (2018) and Chair (2019), American Physical Society, Division of Fluid Dynamics.
- Key participant in the development and maintenance of the JHTDB (Johns Hopkins Turbulence Databases) open numerical laboratory (2008-present).
- Editor-in-Chief, Journal of Turbulence (2003 - 2015).
- Associate Editor, Journal of Fluid Mechanics (September 2005 - 2010).
- Member Editorial Committee, Annual Rev. of Fluid Mechanics (2005-2010).
- Member Advisory Board, Theor. & Comp. Fluid Dynamics (2001 - present).
- Associate Editor, Physics of Fluids (2001 - 2003).
- Guest Associate Editor, Annual Reviews of Fluid Mechanics (2003).

Expertise:

Professor Meneveau's research is focused on understanding and modeling hydrodynamic turbulence, and complexity in fluid mechanics in general. Special emphasis is placed on the multiscale aspects of turbulence, using tools such as subgrid-scale modeling, downscaling techniques, and fractal geometry. Applications of the results to Large Eddy Simulation (LES) have facilitated applications of LES to engineering, environmental and geophysical flow phenomena. Currently Meneveau is focused on applications of LES to wind energy and wind farm fluid dynamics, on developing advanced wall models for LES, on modeling oil dispersion in the ocean, as well as on building "big-data" tools to share the very large data sets that arise in computational fluid dynamics with broad constituencies of scientists and engineers around the world.

Publications in refereed journals:

1. M. Danish & C. Meneveau, "Multi-scale analysis of the invariants of velocity gradient tensor in isotropic turbulence" (2017), *Phys. Rev. Fluids* (submitted).
2. X.I.A. Yang and C. Meneveau, "Hierarchical random additive model for wall-bounded flows at high Reynolds numbers" (2017), *Fluid Dynamics Research* (submitted).
3. B. Chen, D. Yang, C. Meneveau and M. Chamecki, "A Numerical Study of the Effects of Chemical Dispersant on Oil Transport from an Idealized Underwater Blowout" (2018), *Phys. Rev. Fluids* (submitted).
4. R.J.A.M. Stevens and C. Meneveau, "Large Eddy Simulation study of extended wind farms with large inter-turbine spacing" (2017), *Journal of Renewable and Sustainable Energy* (submitted).
5. I. Hameduddin, C. Meneveau, T.A. Zaki and D.F. Gayme, "Geometric decomposition of the conformation tensor in viscoelastic turbulence" (2017), *J. Fluid Mech.* (accepted, in press).
6. L.A. Martinez-Tossas, M.J. Churchfield, A.E. Yilmaz, H. Sarlak, P.L. Johnson, J.N. Sørensen, J. Meyers, C. Meneveau, "Comparison of four LES research codes and effects of model coefficient and inflow turbulence in actuator line based wind turbine modeling" (2017), *Renewable Energy* (accepted, in press).
7. L.J. Lukassen, R.J.A.M. Stevens, C. Meneveau and M. Wilczek, " Modeling space-time correlations of velocity fluctuations in wind farms" (2017), *Wind Energy* (accepted, in press).
8. E. Ramudu, R. Gelderloos, D. Yang, C. Meneveau and A. Gnanadesikan, "Large eddy simulation of heat entrainment under Arctic sea ice" (2017), *J. Geophys. Res.-Oceans* (accepted, in press).
9. J.H. Elsas, A. Szalay and C. Meneveau, "Geometry and scaling laws of excursion and iso-sets of enstrophy and dissipation in isotropic turbulence" (2017), *J. Turbulence* (accepted, in press).
10. C. Shapiro, D.F. Gayme & C. Meneveau, "Modelling yawed wind turbine wakes: a lifting line approach" (2018), *J. Fluid Mech.* **841**, R1, 1-12.
11. C. Shapiro, J. Meyers, C. Meneveau & D.F. Gayme, "Wind farms providing secondary frequency regulation: Evaluating the performance of model-based receding horizon control" (2018), *Wind Energy Science* **3**, 11-24.

12. M. Buzzicotti, M. Linkmann, H. Aluie, L. Biferale, J. Brasseur and C. Meneveau, "Effect of filter type on the statistics of energy transfer between resolved and subfilter scales from a-priori analysis of direct numerical simulations of isotropic turbulence" (2018), *J. Turbulence* **19**, 167-197.
13. J. Bretheim, C. Meneveau and D.F. Gayme, "A restricted nonlinear large eddy simulation model for high Reynolds number flows" (2018), *J. Turbulence* **19**, 141-166.
14. P. Johnson and C. Meneveau, "Predicting viscous-range velocity gradient dynamics in large-eddy simulations of turbulence" (2018), *J. Fluid Mech.* **837**, 80-114
15. R.J.A.M. Stevens, L.A. Martinez-Tossas, & C. Meneveau, "Comparison of wind farm large eddy simulations using actuator disk and actuator line models with wind tunnel experiments" (2018), *Renewable Energy* **116**, 470-478.
16. P. Johnson & C. Meneveau, "Turbulence intermittency in a multiple-time scale, Navier-Stokes based reduced model" (2017), *Phys. Rev. Fluids* **2**, 072601(R).
17. X.I.A. Yang, R. Badya, P. Johnson, I. Marusic & C. Meneveau, "Structure function tensor scaling in the logarithmic region from attached eddy model of wall-bounded turbulent flows" (2017), *Phys. Rev. Fluids* **2**, 064602.
18. J. Bossuyt, C. Meneveau, & J. Meyers, "Wind farm power fluctuations and spatial sampling of turbulent boundary layers" (2017), *J. Fluid Mech.* **823**, 329-344.
19. C. Shapiro, P. Bauweraerts, J. Meyers, C. Meneveau & D.F. Gayme, "Model-based receding horizon control of wind farms for secondary frequency regulation" (2017), *Wind Energy* **20**, 1261-1275.
20. L.A. Martinez-Tossas, M. Churchfield & C. Meneveau: "Optimal smoothing length scale for actuator line models of wind turbine blades based on Gaussian body force distribution" (2017), *Wind Energy* **20**, 1083-1096.
21. J. Sadique, X.I.A. Xiang, C. Meneveau & R. Mittal: "Aerodynamic properties of rough surfaces with high aspect-ratio roughness elements - Effect of aspect-ratio and arrangements" (2017), *Bound. Layer Met.* **163**, 203-224.
22. P. Johnson & C. Meneveau, "Restricted Euler dynamics along trajectories of small inertial particles in turbulence" (2017), *J. Fluid Mech.* **816**, R2.
23. J. Bossuyt, M.F. Howland, C. Meneveau & J. Meyers, "Measurement of unsteady loading and power output variability in a micro wind farm model in a wind tunnel" (2017), *Exp. in Fluids* **58**, 1.
24. X.I.A. Yang & C. Meneveau: "Modeling turbulent boundary layer flow over fractal-like multiscale terrain using Large Eddy Simulations and analytical tools" (2017), *Phil. Trans. R. Soc. A*, **375**, 20160098.
25. R.J.A.M. Stevens & C. Meneveau, "Flow structure and turbulence in wind farms", (2017), *Annu. Rev. Fluid Mech.* **49**, 311-339.
26. P. Johnson, S. Hamilton, R. Burns & C. Meneveau (2017), "Analysis of Lagrangian stretching in turbulent channel flow using a database task-parallel particle tracking algorithm", *Phys. Rev. Fluids* **2**, 014605.
27. S. Xie, C.L. Archer, N. Ghaisas and C. Meneveau, "Benefits of collocating vertical-axis and horizontal-axis wind turbines in large wind farms" (2017), *Wind Energy* **20**, 45-62.
28. X.I.A. Yang & C. Meneveau: "Large Eddy Simulations and parameterization of roughness element orientation and flow direction effects in rough wall boundary

- layers” (2016), *J. Turbulence* **17**, 1072-1085.
29. P. Johnson & C. Meneveau: “A closure for Lagrangian velocity gradient evolution in turbulence using recent deformation mapping of initially Gaussian fields” (2016). *J. Fluid Mech.* **804**, 387-419.
 30. X.I.A. Yang, C. Meneveau, I. Marusic & L. Biferale: “Extended Self-similarity in Moment-Generating-Functions in Wall-bounded Turbulence at High Reynolds Number” (2016), *Phys. Rev. Fluids* **1**, 044405.
 31. R.J.A.M. Stevens, B.F. Hobbs, A. Ramos & C. Meneveau, “Combining economic and fluid dynamic models to determine the optimal spacing in very large wind farms”, (2016), *Wind Energy* **20**, 465-477.
 32. M.G. Giometto, A. Christen, C. Meneveau, J. Fang, M. Krafczyk, M.B. Parlange: “Spatial characteristics of roughness sublayer mean flow and turbulence over a realistic urban surface” (2016), *Bound. Layer Met.* **160**, 425-452.
 33. M.F. Howland, J. Bossuyt, L.A. Martínez-Tossas, J. Meyers & C. Meneveau: “Wake Structure of Wind Turbines in Yaw under Uniform Inflow Conditions” (2016), *J. Sust. Renew. Energy* **8**, 043301.
 34. X.I.A. Yang, I. Marusic & C. Meneveau: “A hierarchical random additive process and logarithmic scaling of generalized high order, two-point correlations in turbulent boundary layer flow” (2016), *Phys. Rev. Fluids.* **1**, 024402.
 35. W. Munters. C. Meneveau & J Meyers, “Shifted periodic boundary conditions for simulations of wall-bounded turbulent flows” (2016), *Phys. Fluids* **28**, 025112.
 36. W. Munters, C. Meneveau & J. Meyers, “Turbulent inflow precursor method with time-varying direction for large-eddy simulations and applications to wind farms” (2016), *Bound. Layer Met.* **159**, 305-328
 37. B. Chen, D. Yang, C. Meneveau & M. Chamecki: “ENDLESS: An Extended Non-periodic Domain Large-Eddy Simulation Approach for Scalar Plumes” (2015), *Ocean Modeling* **101**, 121-132.
 38. D. Yang, B. Chen, S.A. Socolofsky, M. Chamecki & C. Meneveau, “Large-eddy simulation and parameterization of buoyant plume dynamics in stratified flow” (2016), *J. Fluid Mech.* **794**, 798-833.
 39. L. Lignarolo, Mehta, D.; Stevens, R.; Yilmaz, A.E., van Kuik, G., Andersen, S.J., Meneveau, C, Simão Ferreira, C.J., Ragni, D., Meyers, J., van Bussel, G., Holierhoek, J. (2016), “Validation of four LES and a vortex model against stereo-PIV measurements in the near wake of an actuator disc and a wind turbine”, *Renewable Energy* **94**, 510-52.
 40. P. Johnson & C. Meneveau, “Large-deviation statistics of vorticity stretching in isotropic turbulence”, (2016), *Phys. Rev. E* **93**, 033118.
 41. H. Sarlak, T. Nishino, L.A. Martinez-Tossas, C. Meneveau & J.N. Sørensen: “Assessment of blockage effects on the wake characteristics and power of wind turbines” (2016), *Renewable Energy* **93**, 340-352.
 42. R.J.A.M. Stevens, D. Gayme & C. Meneveau, “Generalized coupled wake boundary layer model: applications and comparisons with field and LES data for two real wind-farm” (2016), *Wind Energy* **19**, 2023-2040.
 43. X.I.A. Yang, I. Marusic & C. Meneveau: “Moment generating functions and scaling laws in the inertial layer of turbulent wall bounded flows” (2016), *J. Fluid Mech.* **791**, R2.

44. X.I.A. Yang, J. Sadique, R. Mittal & C. Meneveau, "Exponential roughness layer and analytical model for turbulent boundary layer flow over rectangular-prism roughness elements" (2016), *J. Fluid Mech.* **789**, 127-165.
45. R.J.A.M. Stevens, D. Gayme & C. Meneveau, "Effects of turbine spacing on the power output of extended wind-farms" (2016), *Wind Energy* **19**, 359-370.
46. X.I.A. Yang & C. Meneveau, "Recycling inflow method for simulations of spatially evolving turbulent boundary layers over rough surfaces" (2015), *J. Turbulence* **17**, No.1, 75-93.
47. J. Graham, K. Kanov, X.I.A. Yang, M. K.Lee, N. Malaya, C.C. Lalescu, R. Burns, G. Eyink, A. Szalay, R.D. Moser, and C. Meneveau, "A Web Services-accessible database of turbulent channel flow and its use for testing a new integral wall model for LES" (2015), *Journal of Turbulence* **17:2**, 181-215.
48. F.J. Alexander, & C. Meneveau, "Open Simulation Laboratories [Guest editors' introduction]" (2015), *Computing in Science & Engineering* **17:5**, 7-9.
49. P. Johnson & C. Meneveau, "Large-deviation joint statistics of the finite-time Lyapunov spectrum in isotropic turbulence", (2015), *Phys. Fluids* **27**, 085110.
50. D. Yang, B. Chen, M. Chamecki & C. Meneveau: "Oil plumes and dispersion in Langmuir, upper-ocean turbulence: large-eddy simulations and K-profile parameterization" (2015), *J. Geophysical Res.-Oceans* **120**, 4729-4759.
51. M. Wilczek, R.J.A.M. Stevens & C. Meneveau, "Height-dependence of spatio-temporal spectra of wall-bounded turbulence – LES results and model predictions" (2015), *J. Turbulence* **16**, 937-949.
52. Sescu & C. Meneveau, "Large-Eddy Simulation and single-column modeling of thermally stratified wind turbine arrays for fully developed, stationary atmospheric conditions" (2015), *J. Atmospheric and Oceanic Tech.* **32**, 1144-1162.
53. V. Maldonado, L. Castillo, A. Thormann & C. Meneveau, "The Role of Free Stream Turbulence with Large Integral Scale on the Aerodynamic Performance of a Wind Turbine Blade" (2015), *J. Wind Eng. & Ind. Aerodyn.* **142**, 246-257.
54. R.J.A.M. Stevens, D. Gayme & C. Meneveau, "Coupled wake boundary layer model of wind-farms" (2015), *J. Sust. Renew. Energy* **7**, 023155.
55. K. Bai, J. Katz & C. Meneveau, "Turbulent flow structure inside a canopy with complex multi-scale elements" (2015), *Bound. Layer Met* **155**, 435-457.
56. C.M. de Silva, I. Marusic, J. D. Woodcock & C. Meneveau, "Scaling of second- and high-order structure functions in turbulent boundary layers" (2015), *J. Fluid Mech.* **769**, 654-686.
57. M. Wilczek, R. Stevens & C. Meneveau, "Spatio-temporal spectra in the logarithmic layer of wall turbulence: large-eddy simulations and simple models" (2015), *J. Fluid Mech.* **769**, R1.
58. X.I.A. Yang, J. Sadique, R. Mittal & C. Meneveau, "Integral Wall Model for Large Eddy Simulations of wall-bounded turbulent flows" (2015), *Phys. Fluids* **27**, 025112.
59. Thormann & C. Meneveau, "Decaying turbulence in the presence of a shearless uniform kinetic energy gradient" (2014), *J. Turbulence* **16**, No. 5, 442–459.
60. J.U. Bretheim, C. Meneveau & D.F. Gayme, "Standard logarithmic mean velocity distribution in a band-limited restricted nonlinear model of turbulent flow in a half-channel" (2015), *Phys. Fluids* **27**, 011702.

61. C. VerHulst & C. Meneveau: "Altering kinetic energy entrainment in LES of large wind farms using unconventional wind turbine actuator forcing" (2015), *Energies* **8**, 370-386.
62. H. Sarlak, C. Meneveau & J.N. Sørensen, "Role of subgrid-scale modelling in large eddy simulation of wind turbine wake interactions" (2015), *Renewable Energy* **77**, 386-399.
63. R.J.A.M. Stevens, M. Wilczek & C. Meneveau, "Large-eddy simulation study of the logarithmic law for second and higher-order moments in turbulent wall-bounded flow" (2014), *J. Fluid Mech.* **757**, 888-907.
64. M. Wilczek & C. Meneveau, "Pressure Hessian and viscous contributions to velocity gradient statistics based on Gaussian random fields" (2014), *J. Fluid Mech.* **756**, 191-225.
65. L. Biferale, C. Meneveau & R. Verzicco, "Deformation statistics of sub-Kolmogorov-scale ellipsoidal drops in isotropic turbulence" (2014), *J. Fluid Mech.* **754**, 184-207.
66. R.J.A.M. Stevens & C. Meneveau, "Temporal structure of aggregate power fluctuations in large-eddy simulations of extended wind-farms" (2014), *J. Sust. Renew. Energy* **6**, 0431002.
67. J. Boschung, P. Schaefer, N. Peters, and C. Meneveau, "The local topology of stream- and vortex lines in turbulent flows" (2014), *Phys. Fluids* **26**, 045107.
68. D. Yang, C. Meneveau & L. Shen, "Effect of swells on offshore wind energy harvesting - a Large-Eddy Simulation study" (2014), *Renewable Energy* **70**, 11-23.
69. D. Yang, M. Chamecki, C. Meneveau, "Inhibition of oil plume dilution due to Langmuir ocean circulation " (2014), *Geophys. Res. Letts.* **41**, 1632-1638.
70. R.J.A.M. Stevens, D. Gayme & C. Meneveau, "Large Eddy Simulation studies of the effects of alignment and wind farm length" (2014), *J. Sust. Renew. Energy* **6**, 023105.
71. R.J.A.M. Stevens, J. Graham, C. Meneveau , "A concurrent precursor inflow method for Large Eddy Simulations and applications to finite length wind farms" (2014), *Renewable Energy* **68**, 46-50.
72. Sescu & C. Meneveau, "A control algorithm for statistically stationary Large Eddy Simulations of thermally stratified boundary layers" (2014), *Quart. J. Royal Met. Soc.* **140**, 2017-2022.
73. VerHulst & C. Meneveau, "Large Eddy Simulation study of the kinetic energy entrainment by energetic turbulent flow structures in extended wind farms" (2014), *Phys. Fluids* **26**, 025113.
74. Thormann & C. Meneveau, "Decay of homogeneous, nearly isotropic turbulence behind active fractal grids" (2014), *Phys. Fluids* **26**, 025112.
75. Yang, C. Meneveau & L. Shen, "Large-Eddy Simulation of off-shore wind farm" (2014), *Phys. Fluids* **26**, 025101.
76. J. Phillip, C. Meneveau, C. de Silva & I. Marusic, "Multiscale analysis of fluxes at the turbulent/non-turbulent interface in high Reynolds number boundary layers" (2014), *Phys. Fluids* **26**, 01510.
77. L. Chevillard & C. Meneveau, "Orientation dynamics of small, triaxial-ellipsoidal particles in isotropic turbulence" (2013), *J. Fluid Mech.* **737**, 571-596.
78. G. Katul, A. Porporato, C. Manes, and C. Meneveau, "Co-spectrum and mean

- velocity in turbulent boundary layers" (2013), *Phys. Fluids* **25**, 091702.
79. C.M. de Silva, J. Philip, K. Chauhan, C. Meneveau & I. Marusic, "Multiscale geometry and scaling of the turbulent/non-turbulent interface in high Reynolds number boundary layers" (2013), *Phys. Rev. Lett.* **111**, 044501.
 80. K. Bai, C. Meneveau & J. Katz, "Experimental study of spectral energy fluxes in turbulence generated by a fractal, tree-like object" (2013), *Phys. Fluids* **25**, 110810.
 81. G. Eyink, E. Vishniac, C. Lalescu, H. Aluie, K. Kanov, K. Bürger, R. Burns, C. Meneveau, & A. Szalay, "Flux-freezing breakdown observed in high-conductivity magnetohydrodynamic turbulence" (2013), *Nature* **497**, 466-469.
 82. D. Yang, L. Shen & C. Meneveau, "An Assessment of Dynamic Subgrid-Scale Sea-Surface Roughness Models" (2013), *Flow, Turb. & Comb.* **91**, 541-563.
 83. D. Yang, C. Meneveau & L. Shen, "Dynamic modeling of sea-surface roughness for large-eddy simulation of wind over ocean wavefield", (2013), *J. Fluid Mech*, **726**, 62-99.
 84. A.J. Newman, J. Lebron, C. Meneveau, & L. Castillo, "Streamwise development of the wind turbine boundary layer over a model wind turbine array" (2013), *Phys. Fluids* **25**, 085108.
 85. Meneveau & I. Marusic, "Generalized logarithmic law for high-order moments in turbulent boundary layers " (2013), *J. Fluid Mech.* **719**, R1.
 86. C.C. Lalescu, C. Meneveau & G. Eyink, "Synchronization of Chaos in Fluid Turbulence" (2013), *Phys. Rev. Lett.* **110**, 0841102.
 87. J. Meyers & C. Meneveau, "Flow visualization using momentum and energy transport tubes and applications to turbulent flow in wind farms", (2013), *J. Fluid Mech.* **715**, 335-358.
 88. N. Hamilton, H.S. Kang, C. Meneveau & R.B. Cal, "Statistical analysis of kinetic energy entrainment in a model wind turbine array boundary layer", (2012), *J. Sust. Renew. Energy* **4**, 063105.
 89. Meneveau, "Germano identity-based subgrid-scale modeling: a brief survey of variations on a fertile theme" (2012), *Phys. Fluids* **24**, 121301.
 90. J. Graham & C. Meneveau, "Modeling turbulent flow over fractal trees using Renormalized Numerical Simulation: Alternate formulations and numerical experiments" (2012), *Phys. Fluids* **24**, 125105.
 91. J. Lebrón, C. Castillo & C. Meneveau, "Experimental study of the kinetic energy budget in a wind turbine streamtube" (2012), *J. Turbulence* **13**, 43.
 92. J. Hong, J. Katz, C. Meneveau & M. Schultz, "Coherent structures and associated subgrid-scale energy transfer in a rough-wall turbulent channel flow" (2012), *J. Fluid Mech.* **712**, 92-128.
 93. H. Yu, K. Kanov, E. Perlman, J. Graham, E. Frederix, R. Burns, A.Szalay, G. Eyink & C. Meneveau, "Studying Lagrangian dynamics of turbulence using on- demand fluid particle tracking in a public turbulence database" (2012), *J. Turbulence* **13**, N. 12.
 94. W. Anderson, P. Passalacqua, F. Porté-Agel & C. Meneveau, "Large-eddy simulation of atmospheric boundary layer flow over fluvial-like landscapes using a dynamic roughness model" (2012), *Bound. Layer Met.* **144**, 263-286.

95. Meneveau, "The top-down model of wind farm boundary layers and its applications" (2012), *J. Turbulence* **13**, N7.
96. K. Bai, C. Meneveau & J. Katz, "Near-wake turbulent flow structure and mixing length downstream of a fractal, tree-like object" (2012), *Bound. Lay. Met.* **143**, 285-308.
97. J. Meyers & C. Meneveau, "Optimal turbine spacing in fully developed wind-farm boundary layers" (2012), *Wind Energy* **15**, 305-317.
98. M. Calaf, M.B. Parlange & C. Meneveau, "Large Eddy Simulation study of scalar transport in fully developed wind-turbine array boundary layers" (2011), *Phys. Fluids* **23**, 126603.
99. L. Chevillard & C. Meneveau, "Lagrangian time correlations of vorticity alignments in isotropic turbulence: observations and model predictions" (2011), *Phys. Fluids* **23**, 101704.
100. L. Chevillard, E. Leveque, F. Taddia, C. Meneveau, H. Yu & C. Rosales, "Local and nonlocal pressure Hessian effects in real and synthetic fluid turbulence" (2011), *Phys. Fluids* **23**, 095108.
101. M. Chamecki & C. Meneveau, "Particle boundary layer above and downstream of an area source: scaling, simulations, and pollen transport" (2011), *J. Fluid Mech.* **683**, 1-26.
102. H.S. Kang, D. Dennis & C. Meneveau, "Flow over fractals: drag forces and near wakes" (2011), *Fractals* **19**, 387-399.
103. C. Meneveau, "Lagrangian dynamics and models of the velocity gradient tensor in turbulent flows" (2011), *Annual Rev. Fluid Mech.* **43**, 219-245.
104. W. Anderson & C. Meneveau, "Dynamic roughness model for large-eddy simulation of turbulent flow over multiscale, fractal-like rough surfaces" (2011), *J. Fluid Mech.*, **679**, 288-314.
105. G. Araya, L. Castillo, C. Meneveau & K. Jansen, "A dynamic multi-scale approach for turbulent inflow boundary conditions in spatially evolving flows" (2011), *J. Fluid Mech.*, **670**, 581-605.
106. J. Meyers, C. Meneveau & B.J. Geurts, "Error-landscape-based multi-objective calibration of the Smagorinsky eddy-viscosity using high-Reynolds-number decaying turbulence data" (2010), *Phys. Fluids* **22**, 125106.
107. W. Anderson & C. Meneveau, "A large-eddy simulation model for boundary layer flow over surfaces with horizontally resolved but vertically unresolved roughness elements" (2010), *Bound. Layer Met.* **137**, 397-415.
108. H. Yu & C. Meneveau, "Scaling of conditional Lagrangian time correlation functions of velocity and pressure gradient magnitudes in isotropic turbulence" (2010), *Flow, Turbulence & Combustion* **85**, 457-472.
109. Bou-Zeid, C. Higgins, H. Huwald, C. Meneveau & M.B. Parlange, "Field study of the dynamics and modelling of subgrid scale turbulence in a stable atmospheric boundary layer over a glacier" (2010), *J. Fluid Mech.* **665**, 480-515.
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7. L.A. Tossas-Martinez, M. Churchfield & C. Meneveau, "A Highly Resolved Large-Eddy Simulation of a Wind Turbine using an Actuator Line Model with Optimal Body Force Projection", J. Phys. Conf. Ser. **753**, 082014.
8. C.R. Shapiro, J. Meyers, C.Meneveau & D.F. Gayme, "Wind farms providing secondary frequency regulation: Evaluating the performance of model-based receding horizon control", J. Phys. Conf. Ser. **753**, 052012.
9. J. Bossuyt, M. Howland, C. Meneveau, & J. Meyers. "Measuring power output intermittency and unsteady loading in a micro wind farm model", 34th Wind Energy Symposium, AIAA SciTech, (AIAA 2016-1992).
10. L.A. Martinez-Tossas, R.J.A.M. Stevens & C. Meneveau. "Wind Turbine Large-Eddy Simulations on Very Coarse Grid Resolutions using an Actuator Line Model." (2016). 34th Wind Energy Symposium, AIAA SciTech, (AIAA 2016-1261)
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21. K. Buerger et al. "Turbulence Visualization at the Terascale on Desktop PCs", paper submitted to IEEE Visualization 2012 conference.
22. C. Meneveau "The top-down model of wind farm boundary layers and its applications" (2011), 6th AIAA Theoretical Fluid Mechanics Conference, AIAA paper 2011-3297.
23. J. Graham, K. Bai, C. Meneveau & J. Katz "LES modeling and experimental measurement of boundary layer flow over multi-scale, fractal canopies" (2011), in Direct and Large-Eddy Simulation VIII, 425 ERCOFTAC Series 15, pp. 233-238 (H. Kuerten et al., eds., DOI 10.1007/978-94-007-2482-2 37).
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29. J. Lebrón, L. Castillo, R.B. Cal, H.S. Kang & C. Meneveau, "Interaction between a wind turbine array and a turbulent boundary layer" (2010), AIAA Paper number 2010-824.
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- pressure gradient turbulent boundary layers” (2010), AIAA Paper number 2010-1252.
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 34. J. Meyer, C. Meneveau & B. Geurts “Error-landscape assessment of LES accuracy using experimental data”, in “Proceedings of DLES-7” Springer 2008 (V. Armenio, ed).
 35. E. Perlman, R. Burns, Y. Li & C. Meneveau, “Data exploration of turbulence simulations using a database cluster” (2007), SC07 International Conference for High Performance Computing, Networking, Storage and Analysis, Reno NV, ACM, IEEE.
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 38. M. Chamecki, C. Meneveau & M.B. Parlange “Effects of local conditions on Smagorinsky and dynamic coefficients for LES of atmospheric turbulence” (2007), in Advances in Turbulence XI, Proceedings of 11th European Turbulence Conference (eds: J. Palma and A. Silva Lopes, Springer), pp. 694-696.
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50. E. Bou-Zeid, C. Meneveau & M.B. Parlange, "Applications of the lagrangian dynamic model in LES of turbulent flow over surfaces with heterogeneous roughness distributions", *Proc. HT-FED04 2004 ASME Heat Transfer/FED Summer Conference, paper HT-FED04-56127, 8p.*
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52. Y-C Chow, O. Uzol, J. Katz & C. Meneveau, "An investigation of axial turbomachinery flow using PIV in an optically-unobstructed facility" *Proc. 9th of International Symposium on Transport Phenomena and Dynamics of Rotating Machinery' Honolulu, Hawaii (2002).*
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57. H.S. Kang and C. Meneveau, "Experimental measurements of subgrid passive scalar anisotropy and universality" (2001), in Proceedings of Direct and Large Eddy Simulation - IV (Geurts, Métais and Friedrich, Eds), Kluwer Academic.
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59. B. Tao, J. Katz, & C. Meneveau, "Application of HPIV data in turbulent duct flow for turbulence modeling", in Proc. Fluids Eng. Division Summer meeting of the ASME, San Fransisco, FEDSM99-7281 (1999).
60. F. Porté-Agel, C. Meneveau & M.B. Parlange, "Dynamic model for large-eddy simulations near the limits of the inertial range of turbulence", in Proc. Fluids Eng. Division Summer meeting of the ASME, San Fransisco, FEDSM99-7835 (1999).
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64. S. Liu, C. Meneveau & J. Katz: "Generation of locally isotropic turbulence in a tank, and its response to rapid straining" (1997), FED-ASME Forum on Turbulent Flows, CD-ROM (1997).
65. C. Meneveau & T. Lund, "Dynamic model with scale-dependent coefficients in the viscous range" (1996), in: Proc. of the Summer Program 1996, Center for Turbulence Research, Stanford University, p. 275-290.
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75. C. Meneveau, T. Lund & J. Chasnov, "On the local nature of the energy cascade" (1992), in: Proc. of the summer program 1992, Center for Turbulence Research, Stanford University, p. 47.
76. C. Meneveau, T. Lund & P. Moin, "Search for subgrid-scale parametrization by projection pursuit regression" (1992), in: Proc. of the summer program 1992, Center for Turbulence Research, Stanford University, p. 61.
77. C. Meneveau "The Fractal Geometry of Turbulence" in: Proceedings of the II Pan American Congress of Applied Mechanics, eds.: Kittl et al. (1991).
78. M. Farge, Y. Guezennec, C.M. Ho & C. Meneveau, "Wavelet analysis of coherent structures", in: Proc. of the Summer Program 1990, CTR, Stanford University.

Recent Keynote/Plenary Lectures:

- *A multiple time-scale Lagrangian model for the velocity gradient tensor*, plenary invited talk at the Cascades II Euromech-Ercoftac Colloquium, Dec. 5-7, 2017, Lyon (France).
- *Progress in Large Eddy Simulation studies of wind turbine wakes and wind farms*, plenary talk at ISROMAC17 meeting, December 16-20, 2017, Maui, Hawaii
- *Modeling wind farms: actuator disks, actuator lines, turbulence and wind power fluctuations*, Keynote talk at the NAWEA Symposium 2017, Ames Iowa.
- *The structure of turbulent flows in wind farms*, keynote lecture at the Turbulent Shear Flows and Processes 10 (TSFP10), July 6-9, 2017, Chicago, IL.
- *Integral wall-model for Large Eddy Simulations and analytical roughness models for turbulent flows over rough surfaces at high Reynolds numbers*, at "International Workshop on High Reynolds Number Turbulence" held Lanzhou, China in October 5-8 2016.
- *Modeling boundary layer flow over fractal-like, multi-scale terrain in large eddy simulations*, Plenary speaker at the "WindFarms in Complex Terrain", Euromech Colloquium, KTH, Stockholm, Sweden, June 8-10, 2016.
- *Turbulencia en la era de "Big Data": permitiendo el acceso público a simulaciones masivas en mecánica de fluidos y aplicaciones*, keynote lecture at COCIM 2015 (Congreso Chileno de Ingeniería Mecánica, Valparaiso, Chile), November 18, 2015.
- *Turbulence in wind farm boundary layers*, plenary talk at the Pan American Congress of Applied Mechanics (PACAM) XIV, March 27, 2014, Santiago, Chile.

Current student and postdoctoral advising:

Current doctoral students:

- Carl Shapiro (co-advised with D. Gayme)
- Kristofer Womack
- Aditya Aiyer
- Samvit Kumar (Co-advised with Prof. R. Mittal)
- Genevieve Starke (co-advised with Prof. D. Gayme)
- Ghanesh Narasimhan (co-advised with Prof. Tamer Zaki)
- Mitchell Fowler (co-advised with Prof. Tamer Zaki)

Current postdocs and research staff:

- Wen Wu (Co-advised with Prof. R. Mittal)
- Zhao Wu

Current Masters students:

- Gilbert Josh

Former student and postdoctoral advisees:

Former doctoral students:

1. Joel Bretheim (PhD 2018, co-advised with D. Gayme). Now at the Naval Research Laboratory.
2. Perry Johnson (PhD 2017), now postdoc at Stanford University.
3. Luis A. "Tony" Martínez-Tossas (PhD 2017), now research scientist at the National Renewable Laboratory (NREL), Colorado.
4. Xiang Yang (PhD 2016, co-advised with R. Mittal). Now postdoc at Stanford University.
5. Jasim Sadique (PhD 2015, co-advised with R. Mittal). Now with Convergent Science.
6. Adrien Thormann (Ph.D. 2015), now with Renault, France.
7. Claire Verhulst (Ph.D., 2015) now Assistant Prof., US Military Academy, West Point, NY.
8. Jason Graham (PhD 2014), now at JHU Applied Physics Lab, Laurel, MD.
9. Kunlun Bai (PhD 2014, co-advised with J. Katz), now postdoc at Yale University.
10. William Anderson (PhD 2011), now Assistant Professor, Department of Mechanical Engineering, Univ. Texas at Dallas, TX.
11. Marcelo Chamecki (PhD 2008, co-advised with M. Parlange), now tenured Associate Professor, Department of Atmospheric & Ocean Sciences, University of California Los Angeles (UCLA).
12. Li Yi (PhD 2007), now Lecturer, University of Sheffield, UK.
13. Vijayant Kumar (PhD 2007, co-advised with M. Parlange), now wind resource engineer with Fremantle Energy, Austin, Texas.
14. Carlos Rosales (PhD 2007), now tenured Associate Professor, Mechanical Engineering, Univ. Técnica Federico Santa María, Valparaíso, Chile.
15. Chad Higgins (PhD 2007, co-advised with M. Parlange), now Assistant Professor, Water Resources Engineering, Oregon State Univ., OR.
16. Stuart Chester (PhD 2006), now with Northrop Gruman, MD.

17. Elie Bou-Zeid (PhD 2005, co-advised with M. Parlange), now tenured Associate Professor, Civil and Environmental Engineering, Princeton University.
18. Jun Chen (PhD 2005, co-advised with J. Katz), now tenured Associate Professor, Mechanical Engineering, Purdue University, Indiana.
19. Jan Kleissl (PhD 2004, co-advised with M. Parlange), now tenured Associate Professor, Mechanical and Aerospace Engineering, University of California, San Diego.
20. Bo Tao (PhD 2001, co-advised with J. Katz), Associate Professor, Wentworth Institute of Technology, Boston, MA.
21. Houshuo Jiang (PhD 2000, co-advised with T. Osborn), now Associate Scientist with tenure at Woods Hole Oceanographic Institution, MA.
22. Stefano Cerutti (Ph.D., 1999), now with Lockheed Martin.
23. Fernando Porté-Agel (PhD 1999, co-advised with M. Parlange), tenured full Professor, EPFL, Lausanne, Switzerland).
24. Alberto Scotti (PhD 1997), now tenured Associate Professor, Marine Sciences Department at University of North Carolina.
25. Shewen Liu (PhD 1997, co-advised with J. Katz), now at US Bureau of Shipping, Texas.
26. John Mansfield (PhD 1997, co-advised with O. Knio), was Research Engineer at Airflow Sciences Corp, Michigan.
27. John O'Neil (PhD 1996), now Research Engineer, Applied Physics Laboratory, Johns Hopkins University, Laurel, MD.

Former postdocs and research staff:

1. Dr. Mohammad Danish, now Assistant Professor, Bennet University, Uttar Pradesh, India.
2. Dr. Kun Yang, now in research administration (Southern Technical Univ. China).
3. Dr. Richard Stevens, now research scientist at University of Twente (tenure-track Assistant Professor after September 2016), The Netherlands.
4. Dr. Di Yang, now Assistant Professor, Mechanical Engineering, University of Houston, TX.
5. Dr. Michael Wilczek, now Max Planck Research Group Leader, Max Planck Institute for Nonlinear Dynamics and Self Organization, Göttingen, Germany.
6. Dr. Adrian Sescu, now Assistant Professor, Aerospace Engineering, Mississippi State University.
7. Dr. Huidan Yu, now Assistant Professor, Mechanical Engineering, University of Indiana - Purdue University at Indianapolis.
8. Dr. Hyung-Suk Kang, now Research Engineer, Applied Physics Laboratory, Johns Hopkins University, Laurel, MD.
9. Dr. Marco Martins-Afonso, now postdoc researcher in Toulouse, France.
10. Dr. Laurent Chevillard, now CNRS researcher, Ecole Normale Supérieure, Lyon, France.
11. Dr. Wusi Yue (postdoc, co-advised with M. Parlange), now research engineer at GSE Systems.
12. Dr. Yu-Heng Tseng (postdoc, co-advised with M. Parlange), now Project Scientist II, NCAR, CO.
13. Dr. Juan Hierro (Fulbright postdoc co-advised with J. Katz), now at LITEC, Zaragoza, Spain.
14. Dr. Oguz Uzol, (co-advised with J. Katz), now with Suzlon Blade Science Center, Vejle, Denmark.

Former Masters students:

1. Yifan Zhang (2018)
2. Matthew Thompson
3. Nicole Cade-Ferreira

4. Michael Leibel (M.S. 2014).
5. Hector Morales (M.S. 2012).
6. Brandon Hahn (M.S. 2012).
7. Taylor Reese (M.S. 2010).
8. Yunke Yang (M.S. 2008).
9. Dan Brzozowski (M.S. 2004).
10. Pamela Rawe (MS. 1999), U.S. Navy.
11. Matthew Hayden (MS. 1999), U.S. Navy.
12. Richard Anderson (M.S. 1995, then PhD in DoGEE with Prof. B. Hobbs), now Assistant Professor, School of Environment and Earth Sciences, Duke University.

Undergraduate student advising:

- Continuous academic advising of undergraduate classes (about 10 students/year)
- Undergraduate research advising: Michael Howland (2014-2016), John Bacon (2014), Vincent Rolin (2011, 2012), Jason Li (RPI undergrad, 2011), José Polo (Univ. Turabo PR undergrad, summer 2008), Francisco Wharton (Univ. Turabo PR undergrad, summer 2008), Gustavo Rivera-Rosario (RPI undergrad, Summers of 2007 and 2008), John Kegelman (2007), Joe Lefkowitz (2007), Lauren Denk (2006), Ryan Mayes (2006) Michael Scheib (2005), Juan Sanchez (2005), Byong-Ho Hwang (2005), Giles Haysom (2005) Anthony Tvaroha (2002), David Breau (1998), Ben Kusmin (1993), Ken El-Sherif (1993).

High-School students:

- Research Practicum supervision of Mr. Nathan Greene, Baltimore Polytechnic HS (2011/2012).
- Research Practicum supervision of Mr. Duane Dennis, Baltimore Polytechnic HS (2008-2010).
- Research Practicum supervision of Mr. Jesse Broccato, Baltimore Polytechnic HS (2007/2008)
- Research Practicum supervision of Mr. Duane Dennis, Baltimore Polytechnic HS (2008/2009). Duane is now undergraduate student at MIT.

Visiting graduate students:

- José-Hugo Elsas (2016-2017), visiting PhD student from Universidade Federal do Rio de Janeiro, Brazil.
- Juliaan Bossuyt (2013-2016), visiting PhD student from KU Leuven, Belgium.
- Wim Munters (2014), visiting PhD student from KU Leuven, Belgium.
- Hamid Sarlak (2012), visiting PhD. Student from Danish Technical University, Denmark.
- Jonas Bochung (2012), visiting M.S. student from Univ. Aachen, Germany.
- Stimit Shah (2012), visiting PhD student from Princeton University.
- Victor Maldonado (2011, 2012), visiting PhD student from RPI, NY.
- Edo Frederix (2011), visiting MS student from Eindhoven University of Technology, Netherlands.
- Marc Calaf (2008-2009), visiting PhD student from EPFL, Switzerland
- Guillermo Araya (Spring 2008), visiting PhD student from RPI, NY.
- Maja Wänström (Fall 2007-Spring 2008), visiting PhD student from Chalmers, Sweden.

- Brian Brzek (Spring 2007), visiting PhD student from RPI, NY.
- Sheila Torres (Spring 2007,2008,2009), visiting PhD student from RPI, NY.
- José Lebron (Spring 2007,2008,2009), visiting PhD student from RPI, NY.
- Fabrice Charlette (PhD 2002), visiting PhD student from Ecole Centrale Paris.
- Fedderik van der Bos, visiting M.S. student 2001.

Host to visiting faculty:

- Ivan Marusic (October 2015)
- Luciano Castillo (2008 - 2011)
- Johan Meyers (August 2007, Spring 2009, Summer 2011, Spring 2014)
- Paolo Gualtieri (May 2007)
- Luca Biferale (Summer 2006, March/April 2016)
- Federico Toschi (Summer 2006)

Courses taught:

Undergraduate:

- Thermodynamics
- Fluid Mechanics I
- Fluid Mechanics II
- Heat Transfer
- Thermal Systems Laboratory (co-taught).
- Introduction to Mechanics I

Graduate:

- Fluid Dynamics I
- Turbulence
- Convection
- Uncertainty Analysis and Downscaling (co-taught)
- Topics in complex systems: fractals, chaos, and self-organization
- Advanced Experimental Techniques (co-taught).

External appointments:

- Member, Scientific Advisory Board of Max Planck Center Twente for Complex Fluid Dynamics, Twente University, The Netherlands, 2017-present.
- Scientific Advisory Board member, Max Planck Institute for Nonlinear Dynamics and Selforganization, Göttingen, Germany, 2013-present.
- RPI, Troy, NY. Start: 2009 - 2012. Adjunct Professor.
- NWRC (National Wind Resource Center, Texas Tech University, Lubbock Texas), 2013 – 2014. Adjunct Professor.

Memberships:

- American Society of Mechanical Engineers (Fellow)
- American Physical Society (Fellow)

- American Academy of Mechanics (Fellow)
- American Institute of Aeronautics and Astronautics
- American Geophysical Union
- Sigma Xi
- Pi Tau Sigma (honorary member)

Consulting:

- 2001-2004: For Applied Scientific Research (Santa Ana, CA) on LES models in grid-free CFD.
- 1996: For Burnett & Co., Inc., wind-tunnel drag measurements for Lacrosse sticks.
- 1995: For Knoll Atomic Power Lab. (Troy, NY), on turbulence modeling for two-phase flows.
- 1992: For "Project C-D", on fluid mechanics of various biomedical devices.

Personal: Married, 2 children.
Fluent in English, Spanish, German, French.