Peter E. Hamlington

Associate Professor, Associate Chair, and Vogel Faculty Fellow
Department of Mechanical Engineering, University of Colorado, Boulder
Department of Aerospace Engineering Sciences, University of Colorado, Boulder (Courtesy)
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Education

2004–2009	**Ph.D. Aerospace Science**, *University of Michigan*, Ann Arbor.
	Dissertation title: *Physics-Based Turbulence Anisotropy Closure Including Nonlocal and Nonequilibrium Effects in Turbulent Flows.* Advisor: Dr. Werner J.A. Dahm.
2004–2005	**M.S. Aerospace Science**, *University of Michigan*, Ann Arbor.
2000–2004	**B.A. Physics**, *University of Chicago*, Chicago, IL, Departmental and General Honors.

Professional Experience

2019–Present	**Associate Professor**, *Department of Mechanical Engineering*, University of Colorado, Boulder, CO.
2012–2019	**Assistant Professor**, *Department of Mechanical Engineering*, University of Colorado, Boulder, CO.
2011–2012	**Assistant Research Professor**, *Department of Aerospace Engineering Sciences*, University of Colorado, Boulder, CO.
2009–2011	**National Research Council Postdoctoral Research Associate**, *Laboratories for Computational Physics and Fluid Dynamics*, Naval Research Lab, Washington, DC. Advisor: Dr. Elaine S. Oran.
2004–2009	**Graduate Research/Teaching Assistant**, *Laboratory for Turbulence and Combustion, Department of Aerospace Engineering*, University of Michigan, Ann Arbor, MI. Advisor: Dr. Werner J.A. Dahm.
2002–2004	**Undergraduate Research Assistant**, *Kavli Institute for Cosmological Physics*, University of Chicago, Chicago, IL. Advisor: Dr. Bruce Winstein.

Affiliations, Appointments, and Fellowships

2018–Present	**Associate Chair (Graduate Program)**, *Department of Mechanical Engineering*, University of Colorado, Boulder, CO.
2018–Present	**Joint appointment**, *National Renewable Energy Laboratory*, Golden, CO.
2016–Present	**Courtesy appointment**, *Department of Aerospace Engineering Sciences*, University of Colorado, Boulder, CO.
2013–Present	**Vogel Faculty Fellow**, *Department of Mechanical Engineering*, University of Colorado, Boulder, CO.
2013–Present	**Affiliate**, *Renewable and Sustainable Energy Institute*, University of Colorado, Boulder, CO.
2013–Present	**Affiliate**, *Department of Atmospheric and Oceanic Sciences*, University of Colorado, Boulder, CO.

Research Interests

Large-scale numerical simulations on high performance computing systems, with a focus on: Turbulent flows, reacting flows, combustion, wildland fires, aerospace propulsion, industrial processing, geophysical fluid dynamics, and ocean and wind renewable energy. Simulations are used to understand fundamental flow physics, to guide the development of improved reduced order models, and for optimization, parameter estimation, and uncertainty quantification.

Honors

2019	Outstanding Service Award, Department of Mechanical Engineering, University of Colorado, Boulder
2019	AIAA Aerodynamic Measurement Technology Best Paper from the 2019 AIAA SciTech Forum
2019	National Science Foundation CAREER Award, Combustion and Fire Sciences Program
2017	Woodward Outstanding Faculty Award, Mechanical Engineering, University of Colorado, Boulder
2017	Dean's Fellowship, College of Engineering, University of Colorado, Boulder
2016	Distinguished Paper on Turbulent Flames, 36th International Symposium on Combustion
2013–Present	Herb and Karen Vogel Faculty Fellowship, Mechanical Engineering, University of Colorado, Boulder
2013	Outstanding Graduate Educator Award, Mechanical Engineering, University of Colorado, Boulder
2009	National Research Council Research Associateship, Naval Research Lab, Washington, DC

2009	College of Engineering Distinguished Achievement Award, Aerospace Engineering, Univ. Michigan
2006	Karen and Paul Van Weelden Fellowship, Rackham Graduate School, University of Michigan
2006	Tau Beta Pi Engineering Honor Society, University of Michigan
2000–2004	Dean's List, University of Chicago
2000–2004	University Scholar Award (merit scholarship), University of Chicago
2000	University of Chicago National Merit Scholarship

Publications (Hamlington student or postdoc: *, Corresponding author: †)

Peer-Reviewed Journal Publications

[1] Ryan Darragh, Colin Towery, Alexei Poludnenko, and Peter E. Hamlington. Particle Pair Dispersion and Eddy Diffusivity in a High-Speed Premixed Flame. *Proceedings of the Combustion Institute*, Accepted, 2020.

[2] S. A. Isaacs*†, C. Lapointe*, and **P. E. Hamlington**. Development and Application of a Thin Flat Heat Pipe Design Optimization Tool for Small Satellite Systems. *Journal of Electronic Packaging*, Accepted, 2020.

[3] Y. Kozak, S. S. Dammati, L. G. Bravo, **P. E. Hamlington**, and A. Y. Poludnenko. WENO interpolation for Lagrangian particles in highly compressible flow regimes. *Journal of Computational Physics*, 402:109054, 2020.

[4] C. Lapointe*†, N. T. Wimer*, J. F. Glusman, A. S. Makowiecki, J. W. Daily, G. B. Rieker, and **P. E. Hamlington**. Efficient simulation of turbulent diffusion flames in openfoam using adaptive mesh refinement. *Fire Safety Journal*, 111:102934, 2020.

[5] J. Quick*†, J. King, R. N. King, **P. E. Hamlington**, and K. Dykes. Wake steering optimization under uncertainty. *Wind Energy Science*, 5:413–426, 2020.

[6] C. A. Z. Towery*, A. Y. Poludnenko, and **P. E. Hamlington**. Detonation initiation by compressible turbulence thermodynamic fluctuations. *Combustion and Flame*, 213:172–183, 2020.

[7] N. T. Wimer*†, C. Lapointe*, J. D. Christopher*, S. P. Nigam*, T. R. S. Hayden, A. Upadhye, M. A. Strobel, G. B. Rieker, and **P. E. Hamlington**. Scaling of the puffing strouhal number for buoyant jets and plumes. *Journal of Fluid Mechanics*, 895:A26, 2020.

[8] J. F. Glusman, K. E. Niemeyer, A. S. Makowiecki, N. T. Wimer*, C. Lapointe*, G. B. Rieker, **P. E. Hamlington**, and J. W. Daily. Reduced Gas-Phase Kinetic Models for Burning of Douglas Fir. *Frontiers in Mechanical Engineering*, 5:40, 2019.

[9] T. R. S. Hayden, C. Lapointe*, N. T. Wimer*, J. D. Christopher*, A. Upadhye, M. A. Strobel, **P. E. Hamlington**, and G. B. Rieker†. Characterization of the buoyant jet above a catalytic combustor using wavelength modulation spectroscopy. *Combustion Science and Technology*, DOI: 10.1080/00102202.2019.1604518, 2019.

[10] T. R. S. Hayden, N. Malarich, D. Petrykowski, S. Nigam*, J. D. Christopher*, C. Lapointe*, N. T. Wimer*, **P. E. Hamlington**, and G. B. Rieker†. Oh radical measurements in combustion environments using wavelength modulation spectroscopy and dual frequency comb spectroscopy near 1491 nm. *Applied Physics B*, Accepted, 2019.

[11] T. R. S. Hayden, D. J. Petrykowski, A. Sanchez, S. P. Nigam*, C. Lapointe*, J. D. Christopher*, N. T. Wimer*, A. Upadhye, M. Strobel, **P. E. Hamlington**, and G. B. Rieker†. Characterization of OH, H_2O, and temperature profiles in industrial flame treatment systems interacting with polymer films. *Proceedings of the Combustion Institute*, 37(2):1571–1578, 2019.

[12] S. H. R. Whitman*, C. A. Z. Towery*, A. Y. Poludnenko, and **P. E. Hamlington**†. Scaling and collapse of conditional velocity structure functions in turbulent premixed flames. *Proceedings of the Combustion Institute*, 37(2):2527–2535, 2019.

[13] S. A. Wieland*, **P. E. Hamlington**†, S. J. Reckinger, and D. Livescu. Effects of isothermal stratification strength on vorticity dynamics for single-mode compressible Rayleigh-Taylor instability. *Physical Review Fluids*, 4:093905, 2019.

[14] J. D. Christopher*, C. Lapointe*, N. T. Wimer*, T. R. S. Hayden, I. Grooms, G. B. Rieker, and **P. E. Hamlington**†. Parameter estimation for complex thermal-fluid flows using approximate Bayesian computation. *Physical Review Fluids*, 3:104602, 2018.

[15] J. Kim, M. Bassenne, C. A. Z. Towery*, **P. E. Hamlington**, A. Y. Poludnenko, and J. Urzay†. Spatially localized multi-scale energy transfer in turbulent premixed combustion. *Journal of Fluid Mechanics*, 848:78–116, 2018.

[16] K. M. Smith*, **P. E. Hamlington**†, K. Niemeyer, B. Fox-Kemper, and N. Lovenduski. Effects of Langmuir Turbulence on Upper Ocean Carbonate Chemistry. *Journal of Advances in Modeling Earth Systems*, doi: 10.1029/2018ms001486, 2018.

[17] M. Ghoreyshi†, R. Darragh*, S. Harrison*, A. J. Lofthouse, and **P. E. Hamlington**. Canard-Wing Interference Effects on the Flight Characteristics of a Transonic Passenger Aircraft. *Aerospace Science and Technology*, 69:342–356, 2017.

[18] S. A. Isaacs*†, D. A. Arias, D. Hengeveld, and **P. E. Hamlington**. Experimental development and computational optimization of flat heat pipes for CubeSat applications. *Journal of Electronic Packaging*, 139(2):020910, 2017.

[19] R. N. King*†, K. Dykes, P. Graf, and **P. E. Hamlington**. Optimization of wind plant layouts using an adjoint approach. *Wind Energy Science*, 2:115–131, 2017.

[20] S. A. Mason*, **P. E. Hamlington**†, B. D. Hamlington, W. M. Jolly, and C. M. Hoffman. Effects of Climate Oscillations on Burning Index Variability in the United States. *Geophysical Research Letters*, 44:7002–7010, 2017.

[21] J. O'Brien, C. A. Z. Towery*, **P. E. Hamlington**, M. Ihme, A. Y. Poludnenko, and J. Urzay†. The cross-scale physical-space transfer of kinetic energy in turbulent premixed flames. *Proceedings of the Combustion Institute*, 36(2):1967–1975, 2017.

[22] **P. E. Hamlington**†, R. Darragh*, C. A. Briner*, C. A. Z. Towery*, and A. Y. Poludnenko. Lagrangian analysis of high-speed turbulent premixed reacting flows: thermochemical trajectories in hydrogen-air flames. *Combustion and Flame*, 186:193–207, 2017.

[23] R. N. King*, **P. E. Hamlington**†, and W. J. A. Dahm. Autonomic closure for turbulence simulations. *Physical Review E*, 93:031301(R), 2016.

[24] K. M. Smith*†, **P. E. Hamlington**, and B. Fox-Kemper. Effects of submesoscale turbulence on ocean tracers. *Journal of Geophysical Research: Oceans*, 121(1):908–933, 2016.

[25] N. Suzuki, B. Fox-Kemper, **P. E. Hamlington**, and L. P. Van Roekel. Surface Waves Affect Frontogenesis. *Journal of Geophysical Research: Oceans*, 121(5):3597–3624, 2016.

[26] C. A. Z. Towery*, A. Y. Poludnenko, J. Urzay, J. O'Brien, M. Ihme, and **P. E. Hamlington**†. Spectral kinetic energy transfer in turbulent premixed reacting flows. *Physical Review E*, 93:053115, 2016.

[27] S. R. Alexander* and **P. E. Hamlington**†. Analysis of turbulent bending moments in tidal current boundary layers. *Journal of Renewable and Sustainable Energy*, 7:063118, 2015.

[28] B. D. Hamlington, **P. E. Hamlington**†, S. G. Collins*, S. R. Alexander*, and K.-Y. Kim. Effects of Climate Oscillations on Wind Resource Variability in the United States. *Geophysical Research Letters*, 42(1):145–152, 2015.

[29] K. McCaffrey†, B. Fox-Kemper, **P. E. Hamlington**, and J. Thomson. Characterization of turbulence anisotropy, coherence, and intermittency at a prospective tidal energy site: Observational data analysis. *Renewable Energy*, 76:441–453, 2015.

[30] **P. E. Hamlington**† and M. Ihme. Modeling of Non-Equilibrium Homogeneous Turbulence in Rapidly Compressed Flows. *Flow, Turbulence and Combustion*, 93(1):93–124, 2014.

[31] **P. E. Hamlington**†, L. P. Van Roekel, B. Fox-Kemper, K. Julien, and G. Chini. Langmuir–Submesoscale Interactions: Descriptive Analysis of Multiscale Frontal Spindown Simulations. *Journal of Physical Oceanography*, 44:2249–2272, 2014.

[32] L. P. Van Roekel, B. Fox-Kemper, P. P. Sullivan, **P. E. Hamlington**, and S. R. Haney. The form and orientation of Langmuir cells for misaligned winds and waves. *Journal of Geophysical Research: Oceans*, 117:C05001, 2012.

[33] **P. E. Hamlington**, D. Krasnov, T. Boeck, and J. Schumacher†. Local dissipation scales and energy dissipation statistics in turbulent channel flow. *Journal of Fluid Mechanics*, 701:419–429, 2012.

[34] **P. E. Hamlington**†, D. Krasnov, T. Boeck, and J. Schumacher. Statistics of the energy dissipation rate and local enstrophy in turbulent channel flow. *Physica D*, 241(3):169–177, 2012.

[35] **P. E. Hamlington**[†], A. Y. Poludnenko, and E. S. Oran. Intermittency in premixed turbulent reacting flows. *Physics of Fluids*, 24:075111, 2012.

[36] **P. E. Hamlington**[†], A. Y. Poludnenko, and E. S. Oran. Interactions between turbulence and flames in premixed reacting flows. *Physics of Fluids*, 23:125111, 2011.

[37] **P. E. Hamlington**[†] and W. J. A. Dahm. Frequency response of periodically sheared homogeneous turbulence. *Physics of Fluids*, 21:055107, 2009.

[38] **P. E. Hamlington**[†] and W. J. A. Dahm. Nonlocal form of the rapid pressure-strain correlation in turbulent flows. *Physical Review E*, 80:046311, 2009.

[39] **P. E. Hamlington**[†] and W. J. A. Dahm. Reynolds stress closure for nonequilibrium effects in turbulent flows. *Physics of Fluids*, 20:115101, 2008.

[40] **P. E. Hamlington**[†], J. Schumacher, and W. J. A. Dahm. Direct assessment of vorticity alignment with local and nonlocal strain rates in turbulent flows. *Physics of Fluids*, 20:111703, 2008.

[41] **P. E. Hamlington**[†], J. Schumacher, and W. J. A. Dahm. Local and nonlocal strain rate fields and vorticity alignment in turbulent flows. *Physical Review E*, 77:026303, 2008.

Peer-Reviewed Journal Publications (Submitted)

[42] J. D. Christopher*, O. A. Doronina*, D. Petrykowski, T. R. S. Hayden, C. Lapointe*, N. T. Wimer*, I. Grooms, G. B. Rieker, and **P. E. Hamlington**[†]. Flow Parameter Estimation Using Laser Absorption Spectroscopy and Approximate Bayesian Computation. *Experiments in Fluids*, Submitted, 2020.

[43] O. Doronina*, C. Towery*, and **P. E. Hamlington**[†]. Parameter Estimation for Subgrid-Scale Models Using Markov Chain Monte Carlo Approximate Bayesian Computation. *Physical Review Fluids*, Submitted, 2020.

[44] A. Kshitij, E. Stallcup, C. A. Z. Towery*, **P. E. Hamlington**, and W. J. A. Dahm[†]. Accurate and Efficient Autonomic Closure for Large Eddy Simulations. *Flow, Turbulence and Combustion*, Under review, 2020.

[45] Amanda S Makowiecki, Daniel I Herman, Nazanin Hoghooghi, Elizabeth F Strong, Ryan K Cole, Gabriel G Ycas, Fabrizio R Giorgetta, Caelan B Lapointe, Jeffery F Glusman, John W Daily, Peter E Hamlington, Nathan R Newbury, Ian R Coddington, and Gregory B Rieker. Mid-Infrared Dual Frequency Comb Spectroscopy for Combustion Analysis from 2.8 to 5 Microns. *Proceedings of the Combustion Institute*, Under review, 2020.

[46] Amanda S. Makowiecki, Julie Steinbrenner, Nicholas T. Wimer, Jeffery F. Glusman, Caelan B. Lapointe, John W. Daily, Peter E. Hamlington, and Gregory B. Rieker. Dual Frequency Comb Spectroscopy of Solid Fuel Pyrolysis and Combustion: Quantifying the Influence of Moisture Content in Douglas Fir. *Fire Safety Journal*, Under review, 2020.

[47] K. M. Smith*, S. Kern*, **P. E. Hamlington**[†], M. Zavatarelli, N. Pinardi, E. K. Klee, and K. E. Niemeyer. Reduced-Order Biogeochemical Flux Model for Upper Ocean Biophysical Simulations. *Geoscientific Model Development*, Under review, 2020.

[48] C. A. Z. Towery*, S. Walters, S. M. Guzik, X. Gao, and **P. E. Hamlington**. A Scaling Law for the Required Transition Zone Depth in Hybrid LES-DNS of Turbulent Premixed Flames. *Journal of Turbulence*, Submitted, 2020.

[49] N. T. Wimer*[†], M. S. Day, C. Lapointe*, A. S. Makowiecki, J. F. Glusman, J. W. Daily, G. B. Rieker, and **P. E. Hamlington**. High-resolution numerical simulations of a large-scale helium plume using adaptive mesh refinement. *Theoretical and Computational Fluid Dynamics*, Under review, 2019.

Conference Proceedings

[50] O. Doronina*, C. Towery*, J. Christopher*, I. Grooms, and **P. Hamlington**. Turbulence Model Development Using Markov Chain Monte Carlo Approximate Bayesian Computation. *AIAA Paper*, AIAA-2019-1883, 2019.

[51] J. F. Glusman, C. Rogers, C. B. Lapointe, N. Labbe, G. B. Ellison, **P. Hamlington**, and J. W. Daily. Modeling a micro-reactor with transonic regions. *Proceedings of the 11th U.S. National Meeting on Combustion*, 2019.

[52] S. A. Isaacs* and **P. E. Hamlington**. Development and Application of a Thin Flat Heat Pipe Design Optimization Tool for Small Satellite Systems. *2019 18th IEEE Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITherm)*, pages 666–674, 2019.

[53] Y. Kozak, S. S. Dammati, L. Bravo, **P. Hamlington**, and A. Poludnenko. Novel Lagrangian-Particle

Tracking Method for Highly Compressible, Turbulent, Reacting Flows. *AIAA Paper*, AIAA-2019-1642, 2019.

[54] C. Lapointe*, N. T. Wimer*, J. F. Glusman, A. S. Makowiecki, J. W. Daily, G. B. Rieker, and **P. E. Hamlington**. Progress towards high fidelity simulations of large-scale fires. *Proceedings of the 11th U.S. National Meeting on Combustion*, 2019.

[55] A. S. Makowiecki, N. T. Wimer*, J. F. Glusman, J. W. Daily, **P. E. Hamlington**, and G. B. Rieker. Comparison of flame temperatures to mass flux rates for wildland fire fuels. *Proceedings of the 11th U.S. National Meeting on Combustion*, 2019.

[56] M. Meehan*, J. Christopher*, C. Lapointe*, and **P. Hamlington**. Coherent Feature Extraction in Turbulent Buoyant Jets Using Modal Decompositions. *AIAA Paper*, AIAA-2019-0323, 2019.

[57] J. Quick*, **P. Hamlington**, R. King, and M. Sprague. Multifidelity Uncertainty Quantification with Applications in Wind Turbine Aerodynamics. *AIAA Paper*, AIAA-2019-0542, 2019.

[58] B. Schmidt, C. Towery*, **P. Hamlington**, and J. Sutton. Evaluation of Wavelet-Based Optical Flow Velocimetry from OH Scalar Fields in Reacting Turbulent Flows. *AIAA Paper*, AIAA-2019-0270, 2019.

[59] **P. E. Hamlington**, R. Darragh*, C. A. Z. Towery*, and A. Y. Poludnenko. Retrospective lagrangian analysis of turbulence-chemistry interactions in highly turbulent premixed flames. *Proceedings of the 11th U.S. National Meeting on Combustion*, 2019.

[60] C. Towery*, B. Schmidt, J. Sutton, and **P. Hamlington**. Benchmark Direct Numerical Simulations with Lagrangian Tracers for Evaluating Combustion Diagnostics Algorithms. *AIAA Paper*, AIAA-2019-0836, 2019.

[61] C. Towery*, **P. Hamlington**, X. Zhao, C. Xu, T. Lu, and A. Poludnenko. Lagrangian Chemical Explosive Mode Analysis of Highly Turbulent Premixed Flames. *AIAA Paper*, AIAA-2019-1643, 2019.

[62] C. A. Z. Towery*, X. Gao, S. M. Guzik, and **P. E. Hamlington**. Required Transition Zone Size in Hybrid LES-DNS of Premixed Turbulent Flames. *Proceedings of the 11th U.S. National Meeting on Combustion*, 2019.

[63] C. A. Z. Towery*, J. Urzay, A. Y. Poludnenko, and **P. E. Hamlington**. The cross-scale flux of kinetic energy by baropycnal work in premixed reacting flows. *Proceedings of the 2019 Western States Section of the Combustion Institute Fall Technical Meeting*, 2019.

[64] J. D. Christopher*, D. Petrykowski, T. R. S. Hayden, C. Lapointe*, N. T. Wimer*, S. Nigam*, I. Grooms, **P. E. Hamlington**, and G.B. Rieker. Parameter Estimation using Wavelength Modulation Spectroscopy Temperature Measurements and Approximate Bayesian Computation. In *Light, Energy and the Environment 2018 (E2, FTS, HISE, SOLAR, SSL)*, OSA Technical Digest (Optical Society of America, 2018), paper EM3A.5, 2018.

[65] O. A. Doronina*, J. D. Christopher*, C. A. Z. Towery*, **P. E. Hamlington**, and W. J. A. Dahm. Autonomic Closure for Turbulent Flows Using Approximate Bayesian Computation. *AIAA Paper*, AIAA-2018-0594, 2018.

[66] J. F. Glusman, A. S. Makowiecki, N. T. Wimer*, K. E. Niemeyer, G. B. Rieker, **P. E. Hamlington**, and J. W. Daily. A Chemical Kinetic Model Reduction and Pyrolysis Model for Wildland Fire Direct Numerical Simulation. *Proceedings of the 2018 Western States Section of the Combustion Institute Spring Technical Meeting*, Paper ID: 38CK-0010, 2018.

[67] J. Christopher*, N. Wimer*, T. Hayden, C. Lapointe*, I. Grooms, G. Rieker, and **P. Hamlington**. Parameter Estimation for a Turbulent Buoyant Jet using Approximate Bayesian Computation. *AIAA Paper*, AIAA-2017-0531, 2017.

[68] J. D. Christopher*, C. Lapointe*, N. T. Wimer*, T. R. S. Hayden, I. Grooms, G. B. Rieker, and **P. E. Hamlington**. Parameter Estimation for a Turbulent Buoyant Jet with Rotating Cylinder Using Approximate Bayesian Computation. *AIAA Paper*, AIAA-2017-3629, 2017.

[69] R. Darragh*, C. A. Z. Towery*, A. Y. Poludnenko, and **P. E. Hamlington**. Lagrangian Analysis of Enstrophy in Turbulent Premixed Flames. *Proceedings of the 2017 Western States Section of the Combustion Institute Fall Technical Meeting*, Paper ID: 29TF-0085, 2017.

[70] R. Darragh*, C. A. Z. Towery*, **P. E. Hamlington**, and A. Y. Poludnenko. Lagrangian Analysis of Vorticity Dynamics in Turbulent Premixed Flames. *AIAA Paper*, AIAA-2017-3466, 2017.

[71] T. Hayden, N. Wimer*, C. Lapointe*, J. Christopher*, A. Makowiecki, **P. E. Hamlington**, and G. Rieker.

Characterization of the Output from a Catalytic Combustor Using Wavelength Modulation Spectroscopy. *AIAA Paper*, AIAA-2017-4424, 2017.

[72] T. Hayden, N. Wimer*, C. Lapointe*, J. Christopher*, S. Nigam*, **P. Hamlington**, and G. B. Rieker. Wavelength Modulation Spectroscopy of OH Radical in an Industrial Flame. *Light, Energy and the Environment, OSA Technical Digest (online) (Optical Society of America, 2017)*, Paper ETh2A.4, 2017.

[73] T. Hayden, N. Wimer*, C. Lapointe*, J. Christopher*, **P. E. Hamlington**, and G. Rieker. Characterization of a Jet Above a Catalytic Combustor Using Wavelength Modulation Spectroscopy. *Proceedings of the 10th U.S. National Meeting on Combustion*, 2017.

[74] C. Lapointe*, J. D. Christopher*, N. T. Wimer*, T. R. S. Hayden, G. B. Rieker, and **P. E. Hamlington**. Optimization for Internal Turbulent Compressible Flows Using Adjoints. *AIAA Paper*, AIAA-2017-4115, 2017.

[75] J. Navratil, A. Jirasek*, **P. Hamlington**, and A. Lofthouse. Effect of Angle of Attack, Gas Composition and Reynolds Number on Flutter Boundary of Benchmark Super Critical Wing. *Proceedings of the International Forum on Aeroelasticity and Structural Dynamics*, 2017.

[76] **P. E. Hamlington**, R. Darragh*, and A. Y. Poludnenko. Effects of turbulent advection on thermochemical trajectories in premixed flames. *Proceedings of the 10th U.S. National Meeting on Combustion*, 2017.

[77] C. A. Z. Towery*, R. Darragh*, A. Y. Poludnenko, and **P. E. Hamlington**. Compressible Turbulence Effects on Premixed Autoignition. *AIAA Paper*, AIAA-2017-4286, 2017.

[78] C. A. Z. Towery*, R. Darragh*, A. Y. Poludnenko, and **P. E. Hamlington**. Lagrangian analysis of premixed autoignition in compressible turbulence. *Proceedings of the 2017 Western States Section of the Combustion Institute Fall Technical Meeting*, Paper ID: 29OT-0089, 2017.

[79] C. A. Z. Towery*, **P. E. Hamlington**, and A. Y. Poludnenko. Direct numerical simulation of premixed autoignition in non-linear subsonic and sonic compressible turbulence. *Proceedings of the 10th U.S. National Meeting on Combustion*, 2017.

[80] S. H. R. Whitman*, A. Y. Poludnenko, and **P. E. Hamlington**. Intermittency in Turbulent Premixed Hydrogen-Air Flames. *Proceedings of the 10th U.S. National Meeting on Combustion*, 2017.

[81] S. H. R. Whitman*, C. A. Z. Towery*, A. Y. Poludnenko, and **P. E. Hamlington**. Dependence of Intermittency on Turbulence Intensity, Fuel Type, and Simulation Fidelity in Premixed Reacting Flows. *Proceedings of the 2017 Western States Section of the Combustion Institute Fall Technical Meeting*, Paper ID: 29OT-0084, 2017.

[82] S. A. Wieland*, S. J. Reckinger, **P. E. Hamlington**, and D. Livescu. Effects of Background Stratification on the Compressible Rayleigh Taylor Instability. *AIAA Paper*, AIAA-2017-3974, 2017.

[83] N. T. Wimer*, C. Lapointe*, T. R. S. Hayden, J. D. Christopher*, A. Y. Poludnenko, G. B. Rieker, and **P. E. Hamlington**. Near- and Far-Field Properties of High-Temperature Turbulent Buoyant Jets. *AIAA Paper*, AIAA-2017-4423, 2017.

[84] N. T. Wimer*, A. S. Makowiecki, A. Y. Poludnenko, C. M. Hoffman, J. W. Daily, G. B. Rieker, and **P. E. Hamlington**. Direct Numerical Simulation of Wildland Fires at Small Scales. *Proceedings of the 2017 Western States Section of the Combustion Institute Fall Technical Meeting*, Paper ID: 29FI-0079, 2017.

[85] R. Darragh*, **P. E. Hamlington**, M. Ghoreyshi, and A. Lofthouse. Evaluation of Reduced-Order Models for Predictions of Separated and Vortical Flows. *AIAA Paper*, AIAA-2016-4325, 2016.

[86] S. Harrison*, R. Darragh*, **P. E. Hamlington**, M. Ghoreyshi, and A. J. Lofthouse. Canard-Wing Interference Effects on the Flight Characteristics of a Transonic Passenger Aircraft. *AIAA Paper*, AIAA-2016-4179, 2016.

[87] S. A. Isaacs*, D. Arias, M. Hulse, M. Lake, D. Hengeveld, and **P. Hamlington**. Development of a Two-Phase Heat Strap for CubeSat Applications. *Proceedings of the 46th International Conference on Environmental Systems*, ICES-2016-407, 2016.

[88] S. A. Isaacs*, D. Arias, and **P. E. Hamlington**. Experimental Development and Computational Optimization of Flat Heat Pipes for CubeSat Applications. *2016 ASME International Mechanical Engineering Congress and Exhibition*, IMECE2016-67229, 2016.

[89] R. N. King*, **P. E. Hamlington**, K. Dykes, and P. Graf. Adjoint Optimization of Wind Farm Layouts for Systems Engineering Analysis. *AIAA Paper*, AIAA-2016-2199, 2016.

[90] R. N. King*, **P. E. Hamlington**, and W. J. A. Dahm. A New Autonomic Closure for Large Eddy Simulations. In *Ninth International Symposium on Turbulence and Shear Flow Phenomena, June 30 - July 3, 2015, The University of Melbourne, Australia*, 2015.

[91] R. N. King*, **P. E. Hamlington**, and W. J. A. Dahm. Autonomic Subgrid-Scale Closure for Large Eddy Simulations. *AIAA Paper*, AIAA-2015-1285, 2015.

[92] R. N. King*, **P. E. Hamlington**, and W. J. A. Dahm. Autonomic Subgrid-Scale Closure for Large Eddy Simulations. *Proceedings of the 15th European Turbulence Conference*, 2015.

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[100] **P. E. Hamlington** and E. S. Oran. Signatures of turbulence in atmospheric laser propagation. *Proceedings of the SPIE Active and Passive Signatures Conference*, 7687:76870M, 2010.

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[102] **P. E. Hamlington** and W. J. A. Dahm. Computational validation of new Reynolds stress closure for nonequilibrium effects in turbulent flows. *AIAA Paper*, AIAA-2009-1323, 2009.

[103] **P. E. Hamlington** and W. J. A. Dahm. Reynolds stress closure including nonlocal and nonequilibrium effects in turbulent flows. *AIAA Paper*, AIAA-2009-4162, 2009.

[104] **P. E. Hamlington** and W. J. A. Dahm. A new physically-based fully realizable nonequilibrium Reynolds stress closure for turbulent flow RANS modeling. *AIAA Paper*, AIAA-2007-5573, 2007.

[105] W. J. A. Dahm, A. P. Lapsa, and **P. E. Hamlington**. Inside-out rotary ramjet turbogenerator. *AIAA Paper*, AIAA-2006-4169, 2006.

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Presentations (Hamlington student or postdoc: *)

Conference Presentations: Presentation of Paper by P. E. Hamlington

[P.1] **P. E. Hamlington**, R. Darragh*, C. A. Z. Towery*, and A. Y. Poludnenko (2019) Retrospective Lagrangian Analysis of Turbulence-Chemistry Interactions in Highly Turbulent Premixed Flames. 11th US National Combustion Meeting, 24-27 March 2019, Pasadena, CA.

[P.2] C. A. Z. Towery*, **P. E. Hamlington**, X. Zhao, C. Xu, T. Lu, and A. Y. Poludnenko (2019) Lagrangian Chemical Explosive Mode Analysis of Highly Turbulent Premixed Flames. AIAA SciTech Forum, 7-11 January 2019, San Diego, CA.

[P.3] **P. Hamlington**, R. Darragh*, and A. Poludnenko (2017) Effects of turbulent advection on thermochemical trajectories in premixed flames. 10th U.S. National Meeting on Combustion, 24-26 April 2017, College Park, MD.

[P.4] **P. E. Hamlington**, A. Y. Poludnenko, and E. S. Oran (2011) Intermittency and premixed turbulent reacting flows. 49th AIAA Aerospace Sciences Meeting, 4-7 January 2011, Orlando, FL.

[P.5] **P. E. Hamlington**, A. Y. Poludnenko, and E. S. Oran (2010) Turbulence and scalar gradient dynamics in premixed reacting flows. 40th AIAA Fluid Dynamics Conference, 28 June - 1 July 2010, Chicago, IL.

[P.6] **P. E. Hamlington** and E. S. Oran (2010) Signatures of turbulence in atmospheric laser propagation. SPIE Active and Passive Signatures Conference, 8 April 2010, Orlando, FL.

[P.7] **P. E. Hamlington** and W. J. A. Dahm (2009) Reynolds stress closure including nonlocal and nonequilibrium effects in turbulent flows. 39th AIAA Fluid Dynamics Conference, 22-25 June 2009, San Antonio, TX.

[P.8] **P. E. Hamlington** and W. J. A. Dahm (2009) Computational validation of new Reynolds stress closure for nonequilibrium effects in turbulent flows. 47th AIAA Aerospace Sciences Meeting, 5-8 January 2009, Orlando, FL.

[P.9] **P. E. Hamlington** and W. J. A. Dahm (2007) A new physically-based fully realizable nonequilibrium Reynolds stress closure for turbulent flow RANS modeling. 43rd AIAA Joint Propulsion Conference & Exhibit, 8-11 June 2007, Cincinnati, OH.

Conference Presentations: Abstract Only

[P.10] O. Doronina*, S. Murman, and **P. E. Hamlington** (2019) Approximate Bayesian Computation for Parameter Estimation in RANS Turbulence Models. 72nd Annual meeting, Division of Fluid Dynamics, American Physical Society, Seattle, WA, 23-26 November 2019.

[P.11] R. Darragh*, C. Towery, and **P. E. Hamlington** (2019) Particle Pair Dispersion in a Turbulent Premixed Flame. 72nd Annual meeting, Division of Fluid Dynamics, American Physical Society, Seattle, WA, 23-26 November 2019.

[P.12] C. Lapointe*, N. T. Wimer*, M. S. Day, A. S. Makowiecki, J. F. Glusman, J. W. Daily, G. B. Rieker, and **P. E. Hamlington** (2019) The Study of Fire at Small Scales Using Adaptive Mesh Refinement. 17th International Conference on Numerical Combustion, SIAM, 6-8 May 2019, Aachen, Germany.

[P.13] C. A. Z. Towery*, A. Y. Poludnenko, and **P. E. Hamlington** (2019) Initiation of Spontaneous Detonation in Highly Compressible Turbulence. 17th International Conference on Numerical Combustion, SIAM, 6-8 May 2019, Aachen, Germany.

[P.14] N. T. Wimer*, M. S. Day, A. S. Makowiecki, J. F. Glusman, J. W. Daily, G. B. Rieker, and **P. E. Hamlington** (2019) Low Mach Number AMR Combustion Simulations with PeleLM. SIAM Conference on Computational Science and Engineering, 25 February – 1 March 2019, Spokane, WA.

[P.15] C. Lapointe* N. T. Wimer*, and **P. E. Hamlington** (2018) Progress Towards Efficient Simulation of Large-Scale Fires. 71st Annual meeting, Division of Fluid Dynamics, American Physical Society, Atlanta, GA, 18-20 November 2018.

[P.16] C. A. Z. Towery*, A. Y. Poludnenko, and **P. E. Hamlington** (2018) Spontaneous Detonation Initiation by Temperature Gradients in Compressible Isotropic Turbulence. 71st Annual meeting, Division of Fluid Dynamics, American Physical Society, Atlanta, GA, 18-20 November 2018.

[P.17] O. Doronina*, C. A. Z. Towery*, and **P. E. Hamlington** (2018) Subgrid-Scale Model Development Using Approximate Bayesian Computation. 71st Annual meeting, Division of Fluid Dynamics, American Physical Society, Atlanta, GA, 18-20 November 2018.

[P.18] N. T. Wimer*, M. Day, A. S. Makowiecki, J. F. Glusman, J. W. Daily, G. B. Rieker, and **P. E. Hamlington** (2018) Progress Towards Direct Numerical Simulations of Plumes and Pool Fires. 71st Annual meeting, Division of Fluid Dynamics, American Physical Society, Atlanta, GA, 18-20 November 2018.

[P.19] **P. E. Hamlington**, C. A. Z. Towery*, and A. Y. Poludnenko (2018) Analysis of Highly-Turbulent Premixed Flames Using a Retrospective Lagrangian Analysis. 71st Annual meeting, Division of Fluid Dynamics, American Physical Society, Atlanta, GA, 18-20 November 2018.

[P.20] Y. Kozak, S. S. Dammati, L. O'Neill, **P. E. Hamlington**, and A. Y. Poludnenko (2018) Novel method for Lagrangian-particle analysis of highly compressible reacting turbulence. 71st Annual meeting, Division of Fluid Dynamics, American Physical Society, Atlanta, GA, 18-20 November 2018.

[P.21] S. S. Dammati, Y. Kozak, L. O'Neill, **P. E. Hamlington**, and A. Y. Poludnenko (2018) Lagrangian Analysis of the Thermochemical Trajectories in High-Speed, Turbulent, Premixed Methane-Air and Jet-Fuel-Air

Flames. 71st Annual meeting, Division of Fluid Dynamics, American Physical Society, Atlanta, GA, 18-20 November 2018.

[P.22] C. Towery*, **P. Hamlington**, and A. Poludnenko (2018) Modes of Combustion in Highly Compressible Turbulent Premixed Reacting Flows. 16th Premixed Turbulent Flame Workshop, July 28, 2018, Dublin, Ireland.

[P.23] A. M. Steinberg and **P. E. Hamlington** (2018) Structure and Dynamics of Highly Turbulent Premixed Flames. Joint Session of the 14th International Workshop on Measurement and Computation of Turbulent Flames and the 16th Premixed Turbulent Flame Workshop, July 27, 2018, Dublin, Ireland.

[P.24] C. A. Z. Towery*, A. Y. Poludnenko, and **P. E. Hamlington** (2018) Direct Numerical Simulations of High Intensity Turbulent Combustion and Fire. World Congress of Computational Mechanics, July 23-27, 2018, New York, NY.

[P.25] **P. E. Hamlington**, C. Lapointe*, N. T. Wimer*, and M. Day (2018) Progress Towards Direct Numerical Simulation of Fire Using Adaptive Mesh Refinement. 10th FM Global Open Source CFD Fire Modeling Workshop, May 30-31, 2018, Norwood, MA.

[P.26] N. T. Wimer*, A. S. Mackowiecki, J. F. Glusman, A. Y. Poludnenko, C. Hoffman, J. W. Daily, G. B. Rieker, and **P. E. Hamlington** (2018) Direct Numerical Simulation of a Turbulent Helium Plume and Methane Pool Fire. The Fire Continuum Conference, 21-24 May 2018, Missoula, MT.

[P.27] N. T. Wimer*, A. S. Mackowiecki, A. Y. Poludnenko, C. Hoffman, J. W. Daily, G. B. Rieker, and **P. E. Hamlington** (2017) Examination of Wildland Fire Spread at Small Scales Using Direct Numerical Simulations and High-Speed Laser Diagnostics. American Geophysical Union Fall Meeting, 11-15 December 2017, New Orleans, LA.

[P.28] A. Mackowiecki, N. Wimer*, J. Daily, **P. Hamlington**, G. Rieker, C. Hoffman, and A. Poludnenko (2017) Examination of wildland fire spread at small scales using frequency comb laser diagnostics and direct numerical simulations. 7th International Fire Ecology & Management Congress, 28 November - 2 December, 2017, Orlando, FL.

[P.29] **P. Hamlington**, K. Smith*, K. Niemeyer, B. Fox-Kemper, and N. Lovenduski (2017) Effects of Small-Scale Turbulent Mixing on Upper Ocean Carbonate Chemistry. 70th Annual meeting, Division of Fluid Dynamics, American Physical Society, Denver, CO, 19-21 November 2017.

[P.30] L. Pacheco, K. Smith*, **P. Hamlington**, and K. Niemeyer (2017) Assessing uncertainty in the turbulent upper-ocean mixed layer using an unstructured finite-element solver. 70th Annual meeting, Division of Fluid Dynamics, American Physical Society, Denver, CO, 19-21 November 2017.

[P.31] R. Darragh*, C. Towery*, A. Poludnenko, and **P. Hamlington** (2017) Lagrangian Enstrophy Dynamics in Highly Turbulent Premixed Flames. 70th Annual meeting, Division of Fluid Dynamics, American Physical Society, Denver, CO, 19-21 November 2017.

[P.32] S. H. R. Whitman*, C. A. Z. Towery*, A. Y. Poludnenko, and **P. E. Hamlington** (2017) A Structure Function Analysis of Intermittency and Universality in Turbulent Premixed Flames. 70th Annual meeting, Division of Fluid Dynamics, American Physical Society, Denver, CO, 19-21 November 2017.

[P.33] C. Towery*, R. Darragh*, A. Poludnenko, and **P. Hamlington** (2017) Direct numerical simulations of premixed autoignition in compressible uniformly-sheared turbulence. 70th Annual meeting, Division of Fluid Dynamics, American Physical Society, Denver, CO, 19-21 November 2017.

[P.34] S. Wieland*, S. Reckinger, **P. Hamlington**, and D. Livescu (2017) Multimodal Perturbation Evolution in the Compressible Rayleigh-Taylor Instability. 70th Annual meeting, Division of Fluid Dynamics, American Physical Society, Denver, CO, 19-21 November 2017.

[P.35] A. Jirasek*, **P. Hamlington**, and A. Lofthouse (2017) Unsteady Computational Tests of a Non-Equilibrium Turbulence Model. 70th Annual meeting, Division of Fluid Dynamics, American Physical Society, Denver, CO, 19-21 November 2017.

[P.36] O. Doronina*, J. Christopher*, **P. Hamlington**, and W. Dahm (2017) Autonomic Closure for Turbulent Flows Using Approximate Bayesian Computation. 70th Annual meeting, Division of Fluid Dynamics, American Physical Society, Denver, CO, 19-21 November 2017.

[P.37] J. Christopher*, N. Wimer*, C. Lapointe*, T. Hayden, I. Grooms, G. Rieker, and **P. Hamlington** (2017) Parameter Estimation for a Pulsating Turbulent Buoyant Jet Using Approximate Bayesian Computation. 70th Annual meeting, Division of Fluid Dynamics, American Physical Society, Denver, CO, 19-21 November 2017.

[P.38] S. P. Nigam*, C. Lapointe*, J. D. Christopher*, N. T. Wimer*, T. R. S. Hayden, G. Rieker, **P. Hamlington** (2017) Flame Structure and Dynamics for an Array of Premixed Methane-Air Jets. 70th Annual meeting, Division of Fluid Dynamics, American Physical Society, Denver, CO, 19-21 November 2017.

[P.39] N. Wimer*, A. Mackowiecki, C. Hoffman, A. Poludnenko, J. Daily, G. Rieker, and **P. Hamlington** (2017) Direct Numerical Simulation of Wildland Fires at Small Scales. 70th Annual meeting, Division of Fluid Dynamics, American Physical Society, Denver, CO, 19-21 November 2017.

[P.40] C. Lapointe* and **P. E. Hamlington** (2017) Parameter Optimization for Turbulent Reacting Flows Using Adjoints. 70th Annual meeting, Division of Fluid Dynamics, American Physical Society, Denver, CO, 19-21 November 2017.

[P.41] **P. Hamlington** (2017) Structure Functions and Intermittency in Turbulent Premixed Reacting Flows. Frontiers in Turbulence KRS 70 at the Denver Symposium, 17-18 November, 2017, Denver. CO.

[P.42] **P. Hamlington**, A. Jirasek*, and A. Lofthouse (2017) Reynolds Stress Closure for Nonequilibrium Effects in Turbulent Flows. University of Michigan and NASA Workshop on Advances in Turbulence Modeling, 11-13 July 2017, Ann Arbor, MI.

[P.43] **P. Hamlington** and A. Poludnenko (2017) Turbulence-Flame Interactions in High-Speed Premixed Reacting Flows. 16th International Conference on Numerical Combustion, SIAM, 3-5 April 2017, Orlando, FL.

[P.44] **P. E. Hamlington**, K. M. Smith*, L. P. Van Roekel, B. Fox-Kemper, N. Suzuki, and P. Sullivan (2016) Large-Scale Numerical Simulations of Ocean and Tidal Channel Boundary Layers. American Geophysical Union Fall Meeting, 12-16 December 2016, San Francisco, CA.

[P.45] K. M. Smith*, **P. E. Hamlington**, N. Pinardi, and M. Zavatarelli (2016) Reduced-Order Biogeochemical Flux Model for High-Resolution Multi-Scale Biophysical Simulations. American Geophysical Union Fall Meeting, 12-16 December 2016, San Francisco, CA.

[P.46] C. Towery*, R. Darragh*, A. Poludnenko, and **P. Hamlington** (2016) Detailed thermodynamic analyses of high-speed compressible turbulence. 69th Annual meeting, Division of Fluid Dynamics, American Physical Society, Portland, OR, 20-22 November 2016.

[P.47] N. Wimer*, C. Lapointe*, T. Hayden, J. Christopher*, G. Rieker, and **P. Hamlington** (2016) Effects of Exit Variability on Near-Field Statistics for Turbulent Buoyant Jets. 69th Annual meeting, Division of Fluid Dynamics, American Physical Society, Portland, OR, 20-22 November 2016.

[P.48] R. King* and **P. Hamlington** (2016) Turbulence Model Discovery with Data-Driven Learning and Optimization. 69th Annual meeting, Division of Fluid Dynamics, American Physical Society, Portland, OR, 20-22 November 2016.

[P.49] **P. Hamlington**, S. Whitman*, C. Towery*, and A. Poludnenko (2016) Analysis of Turbulent Scales of Motion in Premixed Flames Using Structure Functions. 69th Annual meeting, Division of Fluid Dynamics, American Physical Society, Portland, OR, 20-22 November 2016.

[P.50] J. Kim, M. Bassenne, C. Towery*, A. Poludnenko, **P. Hamlington**, M. Ihme, and J. Urzay (2016) Wavelet multi-resolution analysis of energy transfer in turbulent premixed flames. 69th Annual meeting, Division of Fluid Dynamics, American Physical Society, Portland, OR, 20-22 November 2016.

[P.51] R. Darragh*, A. Poludnenko, and **P. Hamlington** (2016) Lagrangian analysis of premixed turbulent combustion in hydrogen-air flames. 69th Annual meeting, Division of Fluid Dynamics, American Physical Society, Portland, OR, 20-22 November 2016.

[P.52] C. Lapointe*, N. Wimer*, T. Hayden, J. Christopher*, G. Rieker, and **P. Hamlington** (2016) Scaling Analysis of Temperature Variability Between a Rotating Cylinder and a Turbulent Buoyant Jet. 69th Annual meeting, Division of Fluid Dynamics, American Physical Society, Portland, OR, 20-22 November 2016.

[P.53] J. Christopher*, N. Wimer*, T. Hayden, C. Lapointe*, I. Grooms, G. Rieker, and **P. Hamlington** (2016) Parameter Estimation for a Turbulent Buoyant Jet Using Approximate Bayesian Computation. 69th Annual meeting, Division of Fluid Dynamics, American Physical Society, Portland, OR, 20-22 November 2016.

[P.54] C. Towery*, A. Poludnenko, and **P. Hamlington** (2016) Small-Scale Resolution Requirements for DNS of Supersonic Turbulence. 11th European Fluid Mechanics Conference, Sevilla, Spain, 12-16 September 2016.

[P.55] K. M. Smith*, **P. E. Hamlington**, and B. Fox-Kemper (2016) Submesoscale Tracer Evolution in the Oceanic Mixed Layer. Submesoscale Processes: Mechanisms, Implications, and New Frontiers, University of Liege, Belgium, 23-27 May 2016.

[P.56] **P. E. Hamlington**, K. M. Smith*, and B. Fox-Kemper (2016) Effects of Submesoscale Eddies and Small-Scale Langmuir Turbulence on Multi-Scale Fluxes, Flow Instabilities, and Spectra in the Oceanic Mixed Layer. 2016 Ocean Sciences Meeting, New Orleans, LA, 21-26 February 2016.

[P.57] C. Towery*, A. Poludnenko, and **P. Hamlington** (2015) Dynamics of Strongly Compressible Turbulence. 68th Annual meeting, Division of Fluid Dynamics, American Physical Society, Boston, MA, 22-24 November 2015.

[P.58] **P. Hamlington**, C. Towery*, J. O'Brien, A. Poludnenko, J. Urzay, and M. Ihme (2015) Multiscale Interactions and Backscatter in Premixed Combustion. 68th Annual meeting, Division of Fluid Dynamics, American Physical Society, Boston, MA, 22-24 November 2015.

[P.59] R. King*, **P. Hamlington**, and W. J. A. Dahm (2015) Autonomic Closure for Large Eddy Simulation. 68th Annual meeting, Division of Fluid Dynamics, American Physical Society, Boston, MA, 22-24 November 2015.

[P.60] C. Briner, **P. Hamlington**, and A. Poludnenko (2015) Lagrangian Analysis of Premixed Turbulent Flames. 68th Annual meeting, Division of Fluid Dynamics, American Physical Society, Boston, MA, 22-24 November 2015.

[P.61] K. Smith*, **P. Hamlington**, and B. Fox-Kemper (2015) Characteristics and Evolution of Passive Tracers in the Oceanic Mixed Layer. 68th Annual meeting, Division of Fluid Dynamics, American Physical Society, Boston, MA, 22-24 November 2015.

[P.62] E. Haffner, M. Green, **P. Hamlington**, A. Poludnenko, and E. Oran (2015) Coherent structure dynamics during turbulence-flame interaction. 68th Annual meeting, Division of Fluid Dynamics, American Physical Society, Boston, MA, 22-24 November 2015.

[P.63] **P. Hamlington**, and B. Hamlington (2015) Effects of Climate Oscillations on Wind Resource Variability. AWEA Wind Resource Assessment Webinar – Dynamic Winds, 26 August 2015.

[P.64] **P. Hamlington**, K. Smith*, N. Lovenduski, and B. Fox-Kemper (2015) Large Eddy Simulations of Reactive Tracers in the Oceanic Mixed Layer. 13th U.S. National Congress on Computational Mechanics, 27-30 July 2015, San Diego, CA.

[P.65] K. M. Smith*, **P. E. Hamlington**, N. S. Lovenduski, and B. Fox-Kemper (2015) Characteristics and Evolution of Reactive Tracers in the Oceanic Mixed Layer. 20th AMS Conference on Atmospheric and Oceanic Fluid Dynamics, 14-19 June 2015, Minneapolis, MN.

[P.66] R. King*, **P. Hamlington**, K. Dykes, and P. Graf (2015) Adjoint Optimization of Wind Turbine Locations for Systems Engineering. North American Wind Energy Academy Symposium, 9-11 June 2015, Blacksburg, VA.

[P.67] K. M. Smith*, S. R. Alexander*, L. P. Van Roekel, B. Fox-Kemper, and **P. E. Hamlington** (2014) Effects of Submesoscale Turbulence on Tracer Evolution in the Oceanic Mixed Layer. 67th Annual meeting, Division of Fluid Dynamics, American Physical Society, San Francisco, CA, 23-25 November 2014.

[P.68] C. A. Z. Towery*, A. Y. Poludnenko, and **P. E. Hamlington** (2014) Spectral Kinetic Energy Transfer Through a Premixed Flame Brush. 67th Annual meeting, Division of Fluid Dynamics, American Physical Society, San Francisco, CA, 23-25 November 2014.

[P.69] N. Wimer*, M. Churchfield, and **P. E. Hamlington** (2014) Effects of Offshore Wind Turbines on Ocean Waves. 67th Annual meeting, Division of Fluid Dynamics, American Physical Society, San Francisco, CA, 23-25 November 2014.

[P.70] R. N. King*, W. J. A. Dahm, and **P. E. Hamlington** (2014) Autonomic Closure for Large Eddy Simulations. 67th Annual meeting, Division of Fluid Dynamics, American Physical Society, San Francisco, CA, 23-25 November 2014.

[P.71] C. Towery*, K. Smith*, M. Van Schoor, and **P. Hamlington** (2014) Examination of Turbulent Flow Effects in Rotating Detonation Engines. 44th AIAA Fluid Dynamics Conference, 16-20 June 2014, Atlanta, GA.

[P.72] S. Alexander* and **P. Hamlington** (2014) Study of Turbulence Statistics in Large-Eddy Simulation of Ocean Current Turbine Environments. 33rd ASME International Conference on Ocean, Offshore, and Arctic Engineering, 8-13 June 2014, San Francisco, CA.

[P.73] C. Towery*, K. Smith*, M. Van Schoor, and **P. Hamlington** (2014) Modeling the Effects of Turbulence in Rotating Detonation Engines. American Phys. Soc. March Meeting, 3-7 Mar. 2014, Denver, CO.

[P.74] R. King* and **P. Hamlington** (2014) Local Dissipation Scales in Homogeneous Sheared Turbulence. American Physical Society March Meeting, 3-7 March 2014, Denver, CO.

[P.75] S. Alexander* and **P. Hamlington** (2014) Study of Turbulence Statistics in Large-Eddy Simulation of Ocean Current Turbine Environments. American Physical Society March Meeting, 3-7 March 2014, Denver, CO.

[P.76] **P. E. Hamlington**, S. R. Alexander*, B. Fox-Kemper, and N. Lovenduski (2014) Distributions and Dynamics of Biogeochemical Reactive Tracers in the Oceanic Mixed Layer. 2014 Ocean Sciences Meeting, 23-28 February 2014, Honolulu, HI.

[P.77] **P. E. Hamlington**, S. Alexander*, and B. Fox-Kemper (2013) Properties and Effects of Langmuir Turbulence in the Upper Ocean. American Geophysical Union Fall Meeting, 9-13 December 2013, San Francisco, CA.

[P.78] K. McCaffrey, B. Fox-Kemper, and **P. E. Hamlington** (2013) Characterizing Turbulent Events at a Tidal Energy Site from Acoustic Doppler Velocity Observations. 66th Annual meeting, Division of Fluid Dynamics, American Physical Society, Pittsburgh, PA, 24-26 November 2013.

[P.79] **P. E. Hamlington** (2013) Local dissipation scales in turbulent shear flows. 66th Annual meeting, Division of Fluid Dynamics, American Physical Society, Pittsburgh, PA, 24-26 November 2013.

[P.80] R. N. King*, J. K. Lundquist, and **P. E. Hamlington** (2013) Development and Application of a Wind Energy Computational Testbed in OpenFOAM. First Symposium on OpenFOAM in Wind Energy, 20-21 March, 2013, Oldenburg, Germany.

[P.81] A. C. Ordonez, B. Fox-Kemper, and **P. E. Hamlington** (2013) Energy Extraction from Ocean Currents and Waves: Mapping the Most Promising Locations. 11th Symposium on the Coastal Environment, American Meteorological Society, 5-10 January, 2013, Austin, TX.

[P.82] **P. E. Hamlington**, B. Fox-Kemper, K. Julien, and L. P. Van Roekel (2012) Descriptive analysis of Langmuir-submesoscale interactions using multiscale simulations of the Craik-Leibovich equations. Frontiers in Computational Physics: Modeling the Earth System, 16-20 December 2012, Boulder, CO.

[P.83] **P. E. Hamlington**, L. P. Van Roekel, B. Fox-Kemper, and K. Julien (2012) Interactions between Langmuir turbulence and submesoscale eddies. American Geophysical Union Fall Meeting, 3-7 December 2012, San Francisco, CA.

[P.84] **P. E. Hamlington**, A. Y. Poludnenko, and E. S. Oran (2012) Vorticity dynamics in variable density flows. 65th Annual meeting, Division of Fluid Dynamics, American Physical Society, San Diego, CA, 18-20 November 2012.

[P.85] L. P. Van Roekel, B. Fox-Kemper, P. P. Sullivan, **P. E. Hamlington**, and Haney, S.R. (2012) The form and orientation of Langmuir cells for misaligned wind and waves. 2012 Ocean Sciences Meeting, 19-24 February 2012, Salt Lake City, UT.

[P.86] B. Fox-Kemper, **P. E. Hamlington**, L. Van Roekel, and P. P. Sullivan (2012) Parameterization of submesoscale and Langmuir-scale processes and interactions. 2012 Ocean Sciences Meeting, 19-24 February 2012, Salt Lake City, UT.

[P.87] **P. E. Hamlington**, L. Van Roekel, P. P. Sullivan, and B. Fox-Kemper (2012) Langmuir-Submesoscale Interactions: Multiscale Simulations with the Craik-Leibovich Equations. 2012 Ocean Sciences Meeting, 19-24 February 2012, Salt Lake City, UT.

[P.88] M. Green, **P. Hamlington**, A. Poludnenko, and E. Oran (2011) Using LCS to study coherent structures in reacting flows. 64th Annual meeting, Division of Fluid Dynamics, American Physical Society, Baltimore, MD, 20-22 November 2011.

[P.89] **P. E. Hamlington**, A. Y. Poludnenko, and E. S. Oran (2011) Intermittency in Premixed Turbulent Reacting Flows. 64th Annual meeting, Division of Fluid Dynamics, American Physical Society, Baltimore, MD, 20-22 November 2011.

[P.90] J. Schumacher, **P. E. Hamlington**, D. Krasnov, and T. Boeck (2010) Statistics of the energy dissipation rate and local enstrophy in turbulent channel flow. 63rd Annual meeting, Division of Fluid Dynamics, American Physical Society, Long Beach, CA, 21-23 November 2010.

[P.91] **P. E. Hamlington**, A. Y. Poludnenko, and E. S. Oran (2010) Vorticity, strain rate, and scalar gradient dynamics in premixed reacting flows. 63rd Annual meeting, Division of Fluid Dynamics, American Physical Society, Long Beach, CA, 21-23 November 2010.

[P.92] **P. E. Hamlington**, J. Schumacher, and W. J. A. Dahm (2008) Vorticity alignment with local and nonlocal strain rate eigenvectors in turbulent flows. 61st Annual Meeting, Division of Fluid Dynamics, American Physical Society, San Antonio, TX, 23-25 November 2008.

[P.93] **P. E. Hamlington** and W. J. A. Dahm (2005) Scale by scale assessment of the approach to isotropy in a turbulent shear flow. 58th Annual Meeting, Division of Fluid Dynamics, American Physical Society, Chicago, IL, 20-22 November 2005.

Conference Posters

[P.94] J. F. Glusman, A. Makowiecki, N. T. Wimer*, C. Lapointe*, A. Y. Poludnenko, C. M. Hoffman, J. W. Daily, G. B. Rieker, and **P. E. Hamlington** (2018) Examination of Wildfire Spread at Small Scales Using Direct Numerical Simulations and Frequency Comb Laser Diagnostics. Strategic Environmental Research and Development Program (SERDP) and Environmental Security Technology Certification Program (ESTCP) Symposium, 27 November 2018, Washington, D.C.

[P.95] A. Makowiecki, J. Steinbrenner, J. Glusman, N. Wimer*, J. Daily, **P. Hamlington**, and G. Rieker (2018) Dual Frequency Comb Spectroscopy for the Investigation of Ignition Behaviour of Wildland Fire Fuels. Field Laser Applications in Industry and Research (FLAIR), Assisi, Italy, September 2018.

[P.96] N. T. Wimer*, C. Lapointe*, M. Day, A. Y. Poludnenko, J. F. Glusman, A. S. Makowiecki, J. W. Daily, G. B. Rieker, and **P. E. Hamlington** (2018) Progress Towards Direct Numerical Simulations of Fire Using Adaptive Mesh Refinement. 37th International Symposium on Combustion, 29 July - 3 August 2018, Dublin, Ireland.

[P.97] A. S. Makowiecki, J. E. Steinbrenner, J. F. Glusman, N. T. Wimer*, J. W. Daily, **P. E. Hamlington**, and G. B. Rieker (2018) Diagnostics Suite for Benchmark Data of Wildland Fire Fuels for Application to Physics-Based Models. 37th International Symposium on Combustion, 29 July - 3 August 2018, Dublin, Ireland.

[P.98] J. F. Glusman, A. S. Makowiecki, N. T. Wimer*, K. E. Niemeyer, G. B. Rieker, **P. E. Hamlington**, and J. W. Daily (2018) Experimental Comparison of Small-Scale Biomass Pyrolysis and Reduced Chemical Kinetic Models for Direct Numerical Simulations of Wildland Fires. 37th International Symposium on Combustion, 29 July - 3 August 2018, Dublin, Ireland.

[P.99] K. M. Smith*, S. Kern*, **P. E. Hamlington**, N. Pinardi, and M. Zavatarelli (2018) Effects of Sumbesocale Turbulence on the Evolution of Biogeochemically Tracers. 2018 Ocean Sciences Meeting, New Orleans, LA, 21-26 February 2018.

[P.100] N. T. Wimer*, A. Makowiecki, J. F. Glusman, A. Y. Poludnenko, C. M. Hoffman, J. W. Daily, G. B. Rieker, and **P. E. Hamlington** (2017) Examination of Wildfire Spread at Small Scales Using Direct Numerical Simulations and Frequency Comb Laser Diagnostics. Strategic Environmental Research and Development Program (SERDP) and Environmental Security Technology Certification Program (ESTCP) Symposium, 28-30 November 2017, Washington, D.C.

[P.101] A. S. Makowiecki, N. Hoghooghi, N. T. Wimer*, J. W. Daily, **P. E. Hamlington**, and G. B. Rieker (2017) Cavity Enhanced Dual Frequency Comb Spectroscopy for Characterization of Biomass Pyrolysis. Gordon Research Conference: Laser Diagnostics in Combustion, 6-11 August 2017, West Dover, VT.

[P.102] K. M. Smith*, **P. E. Hamlington**, K. Niemeyer, B. Fox-Kemper, and N. Lovenduski (2017) Effects of Langmuir Turbulence on Upper Ocean Carbonate Chemistry. AMS 21st Conference on Atmospheric and Oceanic Fluid Dynamics, 26-30 June 2017, Portland, OR.

[P.103] N. T. Wimer*, A. Makowiecki, A. Y. Poludnenko, C. M. Hoffman, J. W. Daily, G. B. Rieker, and **P. E. Hamlington** (2017) Examination of Wildland Fire Spread at Small Scales Using Direct Numerical Simulations and Frequency Comb Laser Diagnostics. 12th International Symposium on Fire Safety Science, 12-16 June 2017, Lund, Sweden.

[P.104] K. M. Smith*, **P. E. Hamlington**, N. Pinardi, and M. Zavatarelli (2017) Reduced-Order Biogeochemical Flux Model for High-Resolution Multi-Scale Biophysical Simulations. European Geophysical Union General Assembly, 23-28 April 2017, Vienna, Austria.

[P.105] S. A. Mason*, **P. E. Hamlington**, B. D. Hamlington, W. M. Jolly, and C. M. Hoffman (2016) Effects of Climate Oscillations on Burning Index Variability in the Continental United States. American Geophysical Union Fall Meeting, 12-16 December 2016, San Francisco, CA.

[P.106] J. Kim, M. Bassenne, A. Y. Poludnenko, **P. E. Hamlington**, M. Ihme, and J. Urzay (2016) Wavelet multi-resolution analysis of kinetic-energy transfer in turbulent premixed flames. 36th International Symposium on Combustion, Seoul, Korea, 31 July - 5 August, 2016.

[P.107] R. N. King*, **P. E. Hamlington**, and W. J. A. Dahm (2016) Autonomic Machine Learning Closure for Turbulence Simulations. Physics Informed Machine Learning, Center for Nonlinear Studies, Los Alamos National Laboratory, 2016.

[P.108] N. Suzuki, B. Fox-Kemper, **P. Hamlington**, and L. Van Roekel (2016) Submesoscale Fronts Are Torqued and Energized by Surface Gravity Waves, Turbulence, Larger Scales, and Time Evolution. 2016 Ocean Sciences Meeting, New Orleans, LA, 21-26 February 2016.

[P.109] J. Zhu, B. Fox-Kemper, S. Bachman, L. Van Roekel, **P. Hamlington**, J. Taylor, and L. Thomas (2016) Parameterization for Submesoscale-Permitting Simulations: From Ideal to Traditional to Novel Including Symmetric Instabilities. 2016 Ocean Sciences Meeting, New Orleans, LA, 21-26 February 2016.

[P.110] K. Smith*, **P. Hamlington**, and B. Fox-Kemper (2015) Effects of Submesoscale Turbulence on Oceanic Air-Sea Flux Tracers. 13th U.S. National Congress on Computational Mechanics, 27-30 July 2015, San Diego, CA.

[P.111] K. McCaffrey, B. Fox-Kemper, S. Alexander*, and **P. E. Hamlington** (2015) Coherence, Anisotropy, and Intermittency Measurements from Observational and Model Data at a Prospective Tidal Energy Site. 3rd International Conference on Energy and Meteorology, 22-26 June 2015, Boulder, CO.

[P.112] **P. E. Hamlington**, and S. R. Alexander* (2015) Analysis of turbulent bending moments in tidal current boundary layers. 20th AMS Conference on Atmospheric and Oceanic Fluid Dynamics, 14-19 June 2015, Minneapolis, MN.

[P.113] S. R. Alexander*, **P. E. Hamlington**, and K. McCaffrey (2013) Large-Eddy Simulation of Ocean Current Turbines in the Presence of Realistic Ocean Turbulence. 19th Conference on Atmospheric and Oceanic Fluid Dynamics, American Meteorological Society, 17-21 June 2013, Newport, RI.

[P.114] K. McCaffrey, **P. Hamlington**, and B. Fox-Kemper (2013) Characterizing Turbulent Events at a Tidal Energy Site from ADCP Data. 19th Conference on Atmospheric and Oceanic Fluid Dynamics, American Meteorological Society, 17-21 June 2013, Newport, RI.

[P.115] **P. E. Hamlington**, S. R. Alexander*, and B. Fox-Kemper (2013) Properties of Small-Scale Langmuir Turbulence in the Presence of Submesoscale Eddies. 19th Conference on Atmospheric and Oceanic Fluid Dynamics, American Meteorological Society, 17-21 June 2013, Newport, RI.

[P.116] S. R. Alexander*, **P. E. Hamlington**, and K. McCaffrey (2013) Simulation of Realistic Ocean Turbulence in Large-Eddy Simulations of Ocean Current Turbines. 33rd Los Alamos Center for Nonlinear Studies (CNLS) Annual Conference: Ocean Turbulence, 3-7 June 2013, Santa Fe, NM.

[P.117] **P. E. Hamlington**, S. R. Alexander*, and B. Fox-Kemper (2013) Interactions Between Small-Scale Langmuir Turbulence and Submesoscale Eddies. 33rd Los Alamos Center for Nonlinear Studies (CNLS) Annual Conference: Ocean Turbulence, 3-7 June 2013, Santa Fe, NM.

[P.118] A. Ordonez, **P. Hamlington**, and B. Fox-Kemper (2012) Energy extraction from ocean currents and waves: Mapping the most promising locations. American Geophysical Union Fall Meeting, 3-7 December 2012, San Francisco, CA.

[P.119] A. Ordonez, B. Fox-Kemper, and **P. Hamlington** (2012) Energy extraction from ocean currents and waves: Mapping the most promising locations. Society for the Advancement of Chicanos and Native Americans in Science (SACNAS) National Conference, 10-14 October 2012, Seattle, WA.

Invited Seminars (all by P. E. Hamlington)

[P.120] "Effects of Langmuir Turbulence on Upper Ocean Carbonate Chemistry." University of Bologna, Italy, December 5, 2019.

[P.121] "Progress and Challenges in High-Fidelity Numerical Simulations of Combustion and Fire." Department of Mechanical and Aerospace Engineering Seminar, University of California, San Diego, CA, October 28, 2019.

[P.122] "Progress Towards Direct Numerical Simulations of Fire Using Adaptive Mesh Refinement." Department of Mechanical and Aerospace Engineering Seminar, University of Colorado, Colorado State, September 19, 2019.

[P.123] "Improving Simulation Accuracy Using Approximate Bayesian Computation." 3M Company, St. Paul, MN, July 15, 2019.

[P.124] "Progress Towards Direct Numerical Simulations of Fire Using Adaptive Mesh Refinement." Mechanical and Aerospace Engineering Seminar, Arizona State University, Tempe, AZ, Nov. 9, 2018.

[P.125] "Outer Loops: A New Lease on Life for Reynolds-Averaged Navier-Stokes Modeling" Department of Aerospace Engineering, Texas A&M University, College Station, TX, November 6, 2018.

[P.126] "Progress and Challenges in High-Fidelity Numerical Simulations of Combustion and Fire." Oregon State University, Corvallis, OR, October 26, 2018.

[P.127] "High-Fidelity Numerical Simulations of Combustion and Fire: A Hot Topic in a Warming World." Department of Mechanical Engineering, University of Colorado, Boulder, CO, October 19, 2018.

[P.128] "A Bridge Between Communities: The Study of Wildland Fires Using Techniques from Combustion." Colorado State University, Ft. Collins, CO, October 18, 2018.

[P.129] "Insights Obtained from Direct Numerical Simulations of Highly Turbulent Combustion." Pennsylvania State University, State College, PA, October 11, 2018.

[P.130] "Direct Numerical Simulations of Combustion and Fire." University of Wyoming, Laramie, WY, October 4, 2018.

[P.131] "From Turbines to Trees: Direct Numerical Simulations of Combustion and Fire." National Renewable Energy Laboratory, Golden, CO, July 9, 2018.

[P.132] "Structure and Dynamics of Highly Turbulent Premixed Combustion." Department of Aerospace Engineering, Texas A&M University, College Station, TX, March 26, 2018.

[P.133] "Structure and Dynamics of Highly Turbulent Premixed Combustion." Mechanical and Aerospace Engineering Seminar, Arizona State University, Tempe, AZ, October 13, 2017.

[P.134] "Turbulence-Flame Interactions in Premixed Combustion." Departmental Seminar, Mechanical Engineering, University of New Mexico, January 27, 2017.

[P.135] "Turbulence-Flame Interactions in Premixed Combustion." Los Alamos National Laboratory, January 26, 2017.

[P.136] "Turbulence-Flame Interactions in Premixed Combustion." Departmental Seminar, Aerospace Engineering Sciences, University of Colorado, Boulder, November 9, 2016.

[P.137] "The Future of Computational Fluid Dynamics: Optimization and Machine Learning Techniques for Reacting and Compressible Flows." 3M Tech Forum Simulations Chapter, November 3, 2016.

[P.138] "Large Scale Numerical Simulations of Ocean and Tidal Channel Boundary Layers." University of Bologna, Italy, October 27, 2016.

[P.139] "Oceans and Life; The Discovery of Submesoscales and Their Interaction with Productivity." University of Bologna, Italy, October 26, 2016.

[P.140] "Effects of Climate Oscillations on Wind Resource Variability." Boulder Fluid and Thermal Sciences Seminar, University of Colorado, Boulder, October 2015.

[P.141] "Turbulent Flow Simulations and the Evolution of Tracers in the Oceanic Mixed Layer." Mechanical Engineering Seminar, Colorado School of Mines, Golden, CO, March 17, 2015.

[P.142] "Interactions Between Turbulence and Flames in Premixed Combustion." Mechanical and Aerospace Engineering Seminar, Arizona State University, Tempe, AZ, February 13, 2015.

[P.143] "Effects of Submesoscale Turbulence on Tracer Evolution in the Oceanic Mixed Layer." Hydrology and Water Resources Seminar for CVEN 6393, Department of Civil, Environmental, and Architectural Engineering, University of Colorado, Boulder, CO, October 2014.

[P.144] "Vorticity dynamics in variable density flows." Dynamical Systems Seminar, Department of Applied Mathematics, University of Colorado, Boulder, December 2013.

[P.145] "Langmuir Turbulence in the Oceanic Mixed Layer." Oceanography Seminar, Department of Atmospheric and Oceanic Sciences, University of Colorado, Boulder, October 2013.

[P.146] "Numerical Modeling of Pulsed and Rotating Detonation Engines." Boulder Fluid Dynamics Seminar, University of Colorado, Boulder, October 2013.

[P.147] "Vorticity Dynamics in Variable Density Flows." Center for Turbulence Research (CTR) Tea Seminar, Stanford University, August 2013.

[P.148] "The Non-Normality of Nature: Intermittency in Turbulent Flows." Seminar for CVEN 6393, Department of Civil, Environmental, and Architectural Engineering, University of Colorado, Boulder, CO, January 2013.

[P.149] "Langmuir-Submesoscale Interactions: Multiscale Simulations with the Craik-Leibovich Equations." NCAR IMAGe Theme of the Year Conference, University of Colorado, Boulder, CO, May 2012.

[P.150] "Anisotropy modeling for computational simulations of turbulent flows." Guest colloquium, Ilmenau University of Technology, Ilmenau, Germany, October 2010.

[P.151] "Local and nonlocal strain rate fields and vorticity dynamics in turbulent flows." Fluid Dynamics Review Seminar of the Burgers Program, University of Maryland, College Park, April 2010.

[P.152] "Reynolds stress closure for nonlocal and nonequilibrium effects in turbulent flows." Seminar, Ilmenau University of Technology, Ilmenau, Germany, June 2009.

[P.153] "Reynolds stress closure for nonequilibrium effects in turbulent flows." Computational Aero Sciences Seminar, University of Michigan, Ann Arbor, MI, October 2008.

[P.154] "Vorticity-strain dynamics in turbulent flows and nonequilibrium turbulence anisotropy." Seminar for Geophysical Turbulence group, National Center for Atmospheric Research (NCAR), Boulder, CO, September 2008.

[P.155] "Vorticity-strain dynamics in turbulent flows." Seminar, Ilmenau University of Technology, Ilmenau, Germany, March 2008.

Invited Educational Seminars and Panels (all by P. E. Hamlington)

[P.156] "A Professor's Perspective on Teaching Assistants." Teaching Assistant Lunch, Department of Mechanical Engineering, University of Colorado, Boulder, October 5, 2016.

[P.157] "Introduction to Engineering Faculty Panel." University of Colorado, Boulder, August 31, 2016.

[P.158] "The Use of Computational Fluid Dynamics for Engineering Design, Analysis, Discovery, and Forecasting." Seminar for Senior Design Course, Department of Mechanical Engineering, University of Colorado, Boulder, November 2015.

[P.159] "Teaching the Unsolvable: Fluid Mechanics Education at the Undergraduate and Graduate Levels." Workshop for the Graduate Teaching Program, University of Colorado, Boulder, CO, Feb. 3, 2015.

[P.160] "Turbulent Flow Simulations and the Evolution of Tracers in the Oceanic Mixed Layer." Seminar for MCEN 5027, Department of Mechanical Engineering, University of Colorado, Boulder, Nov. 2014.

[P.161] "Numerical Modeling of Rotating and Pulsed Detonation Engines." Seminar for MCEN 5027, Department of Mechanical Engineering, University of Colorado, Boulder, CO, January 2014.

[P.162] "The Fluid Dynamics of Sports." Seminar for MCEN 5027, Department of Mechanical Engineering, University of Colorado, Boulder, CO, September 2013.

[P.163] "Beyond Curve Fitting: Turbulence Physics and Parameterization." Seminar for MCEN 5027, Department of Mechanical Engineering, University of Colorado, Boulder, CO, August 2012.

[P.164] "Nonlinear eddy viscosity models and nonequilibrium turbulence." Guest Lecture for graduate course in Turbulent Flows (Aero 525), University of Michigan, Ann Arbor, MI, April 2007.

Research Grants

As Principal Investigator (PI): Ongoing

2020–Present **Strategic Environmental Research and Development Program**, *Novel Sloping Wind Tunnel Experiments and Adaptive Mesh Simulations of Fine-Scale Combustion for Physics-Based Models of Wildland Fire*, Resource Conservation and Climate Change Program, Co-PIs: John Daily (CU), John Farnsworth (CU), Michael Hannigan (CU), Kevin Hiers (TTRS), Rodman Linn (LANL), Chad Hoffman (CSU), Greg Rieker (CU), and Nicholas Skowronski (USFS), Total to CU: $2,088,770.

2019–Present **National Science Foundation**, *Collaborative Research: Submesoscale-Resolving Large Eddy Simulations Using Reduced Biogeochemical Models*, Chemical and Physical Oceanography Programs, Co-PIs: Nicole Lovenduski (CU), Kyle Niemeyer (Oregon State University), Total to CU: $284,658; Hamlington share: $245,728.

2019–Present   **National Science Foundation**, *CAREER: Structure and Dynamics of Highly Turbulent Premixed Combustion*, Combustion & Fire Systems Program, Total to CU: $500,645; Hamlington share: $500,645.

2016–Present   **Strategic Environmental Research and Development Program**, *Examination of Wildland Fire Spread at Small Scales Using Direct Numerical Simulations and Frequency Comb Laser Diagnostics*, Resource Conservation and Climate Change Program, Co-PIs: John Daily (CU), Greg Rieker (CU), Chad Hoffman (Colorado State University), and Alexei Poludnenko (Texas A&M), Total to CU: $1,123,971; Hamlington share: $396,742.

2016–Present   **National Aeronautics and Space Administration**, *Spatio-Temporally Adaptive Variable Fidelity Approach to Modeling and Simulation of Complex Turbulent Flows*, Technical Contact: Scott Murman; Co-PI: Yousuff Hussaini (FSU). Total to CU: $447,390; Hamlington share: $447,390.

2017–Present   **Air Force Office of Scientific Research**, *Analysis and Modeling of Turbulence-Flame Interactions in Premixed Reacting Flows*, Energy Conversion and Combustion Sciences Program, Total to CU: $377,992; Hamlington share: $377,992.

2017–Present   **National Renewable Energy Laboratory**, *Uncertainty Quantification and Optimization Under Uncertainty for Wind Plant Modeling*, Alliance Partner University Program, Total to CU: $221,294; Hamlington share: $221,294.

As Co-PI or Subcontractor: Ongoing

2020–Present   **3M Company**, *Development of Novel Automated Optimization and Diagnostic Tools for Particle-Laden and Multiphase Material Processing Systems*, Co-PI: Greg Rieker (CU), Total: $270,000; Hamlington share: $150,000.
Hamlington is equal Co-PI with Greg Rieker at CU.

2017–Present   **Air Force Office of Scientific Research**, *ARMADA- Adaptively Refined Mesh and Algorithm with Data Assimilation*, Energy Conversion and Combustion Sciences Program, Total to CU: $192,886; Hamlington share: $192,886.
Subcontract from Xinfeng Gao at CSU; Hamlington is CU PI.

2015–Present   **3M Company**, *Research and Development of Optimized Polymer Film Flame Treatments*, Co-PI: Greg Rieker (CU), Total: $480,000; Hamlington share: $240,000.
Gift from 3M Company, Hamlington is equal Co-PI with Greg Rieker at CU.

As Principal Investigator (PI): Completed

2016–2018   **U.S. Air Force Academy**, *Physics-Based Turbulence Modeling for Numerical Simulations of High Angle of Attack Unsteady Aerodynamics*, Total to CU: $318,402; Hamlington share: $318,402.

2016–2017   **Los Alamos National Laboratory**, *Adaptive Wavelet-Based Direct Numerical Simulation of Compressible Rayleigh-Taylor Instability*, Technical Contact: Daniel Livescu. Total to CU: $113,414; Hamlington Share: $113,414.

2012–2018   **National Science Foundation**, *Collaborative Research: Reacting Tracers in a Turbulent Mixed Layer*, Physical Oceanography Program, Co-PIs: Nicole Lovenduski (CU), Baylor Fox-Kemper (Brown University), Total to CU: $401,386; Hamlington share: $281,391.

2014–2016   **Air Force Office of Scientific Research**, *Analysis and Modeling of Multi-Scale Interactions in High-Speed Turbulent Reacting Flows*, Energy Conversion and Combustion Sciences Program, Total to CU: $159,740; Hamlington share: $159,740.

2014–2016   **National Renewable Energy Laboratory**, *Wind Energy Systems Engineering, Wake Flow Modeling and Resource Assessment*, Alliance Partner University Program, Total to CU: $175,688; Hamlington share: $175,688.

2015   **U.S. Air Force Academy**, *Numerical Simulations of Unsteady Aerodynamics Using High Performance Computing Resources*, Co-PIs: Kenneth Jansen (CU), John Farnsworth (CU), Total to CU: $48,332; Hamlington share: $24,166.

2012–2014   **National Renewable Energy Laboratory**, *Wind Turbine Recycling and Systems Engineering*, Alliance Partner University Program, Total to CU: $171,432; Hamlington share: $171,432.

As Co-PI or Subcontractor: Completed

2015–2018 **High Performance Computing Modernization Program**, *Dynamics and Properties of High-Speed Turbulent Reacting Flows: From a Jet Engine to an Exploding Star*, PI: Alexei Poludnenko (Texas A&M), Total: $397,611; Hamlington share: $397,611.
Frontier Project from DoD HPCMP, PI: Alexei Poludnenko at Texas A&M University; Hamlington was CU PI.

2013–2014 **Defense Advanced Research Projects Agency**, *Modeling and Optimizing Turbines for Unsteady Flow*, Small Business Technology Transfer Phase I, Industry partner: Midé Technology, Total to CU: $40,000; Hamlington share: $40,000.
DARPA STTR Phase I led by Midé Technology; subaward to CU with Hamlington as CU PI.

Internal Funding As Principal Investigator (PI): Completed

2015–2016 **Innovative Seed Grant**, *High Fidelity Simulations of Wildland Fire Combustion*, University of Colorado, Boulder, Hamlington share: $50,000.
Internal funding from the University of Colorado, Boulder.

Computer Time Grants

2012 **National Center for Atmospheric Research**, *Special Assessment of Frontogenesis, Advanced Computing Resources for CMG: Multiscale Modeling of the Coupling between Langmuir Turbulence and Submesoscale Variability in the Oceanic Mixed Layer*, Accelerated Scientific Discovery for Yellowstone, Co-PIs: B. Fox-Kemper, J. McWilliams, P. P. Sullivan Hamlington, and L. Van Roekel, Total hours: 16,000,000.

2013–2016 **Research Computing, University of Colorado**, *Reactive Tracers in a Turbulent Mixed Layer*, Janus supercomputer, Total computer hours: 2,300,000.

2013–2016 **National Center for Atmospheric Research**, *Reacting Tracers in a Turbulent Mixed Layer*, Computational & Information Systems Laboratory, Yellowstone supercomputer, Total hours: 2,500,000.

2014–2018 **Department of Defense High Performance Computing Modernization Program**, *Dynamics and Properties of High-Speed Turbulent Reacting Flows: From a Jet Engine to an Exploding Star*, PETTT Special Project, PI: Alexei Poludnenko (Texas A&M), Co-PI: Peter Hamlington (CU), Total hours: 750,000,000.

2017–2018 **National Center for Atmospheric Research**, *Reacting Tracers in a Turbulent Mixed Layer*, Computational & Information Systems Laboratory, Cheyenne supercomputer, Total hours: 2,350,000.

2020–Present **Texas Advanced Computing Center**, *Structure and Dynamics of Highly Turbulent Premixed Combustion*, Frontera Pathways, Total hours: 200,000 node hours.

Research Supervision

Principal Advisor: Postdoctoral Researchers

2018–Present **Colin Towery**, Department of Mechanical Engineering, University of Colorado, Boulder.

2016–2018 **Adam Jirasek**, Department of Mechanical Engineering, University of Colorado, Boulder.
Present position: Senior Researcher at the U.S. Air Force Academy, Colorado Springs, CO

Principal Advisor: Ph.D. Completed

2015–2020 **Steven Isaacs**, *Computational Modeling and Optimization of Flat and Small-Scale Vapor Chambers*, Department of Mechanical Engineering, University of Colorado, Boulder.
Comprehensive Exam: May 2017, Defense: January 10, 2020
Present position: Engineer at Roccor, Longmont, CO

2013–2019 **Nicholas Wimer**, *High-Resolution Numerical Simulations of Buoyancy-Driven Flows*, Department of Mechanical Engineering, University of Colorado, Boulder.
Comprehensive Exam: May 2017, Defense: May 2, 2019
Present position: Postdoctoral Researcher at the National Renewable Energy Lab, Golden, CO

2015–2018 **Jason Christopher**, *Approximate Bayesian Computation for Parameter Estimation in Complex Thermal Fluid Systems*, Department of Mechanical Engineering, University of Colorado, Boulder.
Co-Advised with Greg Rieker, Comprehensive Exam: December 2017, Defense: July 19, 2018
Present position: Major in the U.S. Air Force

2012–2018 **Colin Towery**, *Multi-Physics and Multi-Scale Interactions in High-Speed Turbulent Premixed Reacting Flows*, Department of Mechanical Engineering, University of Colorado, Boulder.
Comprehensive Exam: December 2016, Defense: January 4, 2018
Present position: Research Associate at the University of Colorado, Boulder

2016–2017 **Scott Wieland**, *Direct Numerical Simulations of the Compressible Low Atwood Rayleigh-Taylor Instability*, Department of Mechanical Engineering, University of Colorado, Boulder.
Comprehensive Exam: March 2017, Defense: December 6, 2017, Requirements Completed: December 2018
Present position: Postdoctoral Researcher at GATs Inc., Boulder, CO

2013–2017 **Katherine Smith**, *Effects of Submesoscale Turbulence on Reactive Tracers in the Upper Ocean*, Department of Mechanical Engineering, University of Colorado, Boulder.
Comprehensive Exam: December 2016, Defense: August 17, 2017
Present position: Postdoctoral Researcher at the University of Cambridge, UK

2012–2016 **Ryan King**, *Learning and Optimization for Turbulent Flows*, Department of Mechanical Engineering, University of Colorado, Boulder.
Comprehensive Exam: December 2015, Defense: August 16, 2016
Present position: Senior Scientist at the National Renewable Energy Lab, Golden, CO

Principal Advisor: Ph.D. Ongoing

2015–Present **Ryan Darragh**, Department of Aerospace Engineering Sciences, University of Colorado, Boulder.
Comprehensive Exam: August 2019

2016–Present **Caelan Lapointe**, Department of Mechanical Engineering, University of Colorado, Boulder.
Comprehensive Exam: September 2019

2016–Present **Samuel Whitman**, Department of Mechanical Engineering, University of Colorado, Boulder.

2016–Present **Olga Doronina**, Department of Mechanical Engineering, University of Colorado, Boulder.
Comprehensive Exam: November 2019

2017–Present **Skyler Kern**, Department of Mechanical Engineering, University of Colorado, Boulder.

2017–Present **Michael Meehan**, Department of Mechanical Engineering, University of Colorado, Boulder.

2017–Present **Julian Quick**, Department of Mechanical Engineering, University of Colorado, Boulder.

2019–Present **Prakriti Sardana**, Department of Mechanical Engineering, University of Colorado, Boulder.

2020–Present **Sam Simons-Wellin**, Department of Mechanical Engineering, University of Colorado, Boulder.

2020–Present **Mary McGuinn**, Department of Mechanical Engineering, University of Colorado, Boulder.

2020–Present **Jennifer Miklaszewski**, Department of Mechanical Engineering, University of Colorado, Boulder.

Principal Advisor: M.S. Thesis Completed

2019–2020 **Duncan McGough**, Department of Aerospace Engineering Sciences, University of Colorado, Boulder.
Thesis Defense: April 2020
Present position: SpaceX

2016–2018 **Siddharth Nigam**, Department of Mechanical Engineering, University of Colorado, Boulder.
Thesis Defense: May 2018
Present position: Business Technology Analyst at Deloitte, Boston, MA

2013–2014 **Spencer Alexander**, Department of Mechanical Engineering, University of Colorado, Boulder.
Thesis Defense: August 2014
Present position: Software Engineer at Waymo, San Francisco, CA

Principal Advisor: M.S.

2014–2016 **Clarissa Briner**, Department of Physics, University of Colorado, Boulder.
Present position: Software Engineer at Tendril, Denver, CO

2014–2015 **Davis Benz**, Department of Mechanical Engineering, University of Colorado, Boulder.
Co-Advised with Wei Tan
Present position: Engineer I at Terumo BCT, Denver, CO

2014–2015 **Michelle Burns**, Department of Mechanical Engineering, University of Colorado, Boulder.
Present position: Solar Electrical Engineer at WSP USA, Boulder, CO

2012–2014 **Prateek Shrestha**, Department of Mechanical Engineering, University of Colorado, Boulder.
Present position: Senior Air Quality Consultant at Ramboll Environ, Salt Lake City, UT

2012–2013 **Joel Berger**, Department of Mechanical Engineering, University of Colorado, Boulder.
Present position: Senior Asset Manager at Renewable Energy Systems Ltd., Broomfield, CO

Principal Advisor: Undergraduate

2017–2019 **Owen Brown**, Department of Mechanical Engineering, University of Colorado, Boulder.
Present position: Graduate student in Mechanical Engineering at the University of Colorado, Boulder

2015–2017 **Shelby Mason**, Department of Mechanical Engineering, University of Colorado, Boulder.
Present position: Systems Integration and Test Engineer at Lockheed Martin, Boulder, CO

2014–2017 **Allison Leonard**, Department of Mechanical Engineering, University of Colorado, Boulder.

2015–2016 **Sean Harrison**, Department of Mechanical Engineering, University of Colorado, Boulder.
Present position: Graduate student in Computer Science at the University of Colorado, Boulder

2015 **Trevor Roberts**, Department of Mechanical Engineering, University of Colorado, Boulder.
Present position: Mechanical Design Engineer at Mikron Automation, Denver, CO

2014–2015 **Christine Martini**, Department of Mechanical Engineering, University of Colorado, Boulder.
Present position: Lead BNC Designer at Namasté Solar, Denver, CO

2013–2014 **Sean Collins**, Department of Mechanical Engineering, University of Colorado, Boulder.

High School

2013–2014 **Allison Leonard**, Broomfield High School, Broomfield, CO.

Student Fellowships and Awards

2018 **Skyler Kern**, National Science Foundation Graduate Research Fellowship.

2018 **Michael Meehan**, National Science Foundation Graduate Research Fellowship.

2018 **Samuel Whitman**, Blue Waters Graduate Research Fellowship.

2017 **Caelan Lapointe**, National Science Foundation Graduate Research Fellowship.

2017 **Caelan Lapointe**, National Defense Science and Engineering Graduate Fellowship.
Declined in order to accept NSF GRF instead.

2017 **Colin Towery**, Thomas & Brenda Geers Graduate Fellowship, Department of Mechanical Engineering, University of Colorado, Boulder.

2016 **Ryan Darragh**, National Defense Science and Engineering Graduate Fellowship.

2016 **Katherine Smith**, Achievement Rewards for College Scientists (ARCS) Scholarship, University of Colorado, Boulder.

Graduate Teaching

Graduate Lecture-Based Courses

Spring 2020 **MCEN 6001: Reacting Flows**, Professor, Department of Mechanical Engineering, University of Colorado, Boulder.
10 students

Spring 2019 **MCEN 7221: Turbulence**, Professor, Department of Mechanical Engineering, University of Colorado, Boulder (cross-listed with ASEN 5037: Turbulent Flows).
25 students, FCQ Course Overall: 5.1, FCQ Instructor Overall: 5.6

Spring 2018 **MCEN 6001: Reacting Flows**, Professor, Department of Mechanical Engineering, University of Colorado, Boulder (cross-listed with ASEN 6519: Reacting Flows).
19 students, FCQ Course Overall: 5.4, FCQ Instructor Overall: 5.9

Fall 2017 **MCEN 5021: Introduction to Fluid Dynamics**, Professor, Department of Mechanical Engineering, University of Colorado, Boulder.
31 students, FCQ Course Overall: 5.3, FCQ Instructor Overall: 5.5

Spring 2017 **MCEN 7221: Turbulence**, Professor, Department of Mechanical Engineering, University of Colorado, Boulder (cross-listed with ASEN 5037: Turbulent Flows).
24 students, FCQ Course Overall: 5.4, FCQ Instructor Overall: 5.7

Spring 2016 **MCEN 6001: Reacting Flows**, Professor, Department of Mechanical Engineering, University of Colorado, Boulder.
15 students, FCQ Course Overall: 5.6, FCQ Instructor Overall: 5.8

Spring 2015 **MCEN 7221: Turbulence**, Professor, Department of Mechanical Engineering, University of Colorado, Boulder (cross-listed with ASEN 6037: Turbulent Flows).
19 students, FCQ Course Overall: 4.7, FCQ Instructor Overall: 5.4

Fall 2014 **MCEN 5041: Advanced Fluid Mechanics I**, Professor, Department of Mechanical Engineering, University of Colorado, Boulder.
29 students, FCQ Course Overall: 4.8, FCQ Instructor Overall: 5.4

Spring 2014 **MCEN 5228: Fluid Dynamics of Renewable Energy Systems**, Professor, Department of Mechanical Engineering, University of Colorado, Boulder (cross-listed with ASEN 5519: Fluid Dynamics of Renewable Energy Systems).
20 students, FCQ Course Overall: 4.4, FCQ Instructor Overall: 5.2

Fall 2013 **MCEN 6228: Reacting Flows**, Professor, Department of Mechanical Engineering, University of Colorado, Boulder (cross-listed with ASEN 6519: Reacting Flows).
17 students, FCQ Course Overall: 5.4, FCQ Instructor Overall: 5.8

Spring 2013 **MCEN 7221: Turbulence**, Professor, Department of Mechanical Engineering, University of Colorado, Boulder (cross-listed with ASEN 6037: Turbulent Flows).
26 students, FCQ Course Overall: 5.3, FCQ Instructor Overall: 5.6

Fall 2012 **MCEN 5021: Introduction to Fluid Dynamics**, Professor, Department of Mechanical Engineering, University of Colorado, Boulder (cross-listed with ASEN 5051: Fluid Mechanics).
55 students, FCQ Course Overall: 5.0, FCQ Instructor Overall: 5.5

Graduate Seminar Courses

Fall 2019 **MCEN 5208: Introduction to Research**, Professor, Department of Mechanical Engineering, University of Colorado, Boulder.
59 students, FCQ Course Overall: 4.2, FCQ Instructor Overall: 4.9

Fall 2013 **MCEN 5027: Graduate Seminar**, Professor, Department of Mechanical Engineering, University of Colorado, Boulder.
85 students, FCQ Course Overall: 4.6, FCQ Instructor Overall: 5.4

Spring 2013 **MCEN 5027: Graduate Seminar**, Professor, Department of Mechanical Engineering, University of Colorado, Boulder.
78 students, FCQ Course Overall: 4.5, FCQ Instructor Overall: 5.1

Combined Graduate/Undergraduate Lecture-Based Courses

Spring 2016 **MCEN 4228/5228: Optimization with Application to Wind Plant Design**, Professor, Department of Mechanical Engineering, University of Colorado, Boulder.
10 students, FCQ Course Overall: 4.5, FCQ Instructor Overall: 5.0

Graduate Independent Study Supervision

Fall 2019 **Olga Doronina**, *Turbulence Modeling*, MCEN 5898: Independent Study, Department of Mechanical Engineering, University of Colorado, Boulder.

Spring 2018 **Owen Brown**, *Computational Fluid Dynamics*, MCEN 5898: Independent Study, Department of Mechanical Engineering, University of Colorado, Boulder.

Fall 2017 **Ryan Darragh**, *Turbulent Combustion*, ASEN 6849: Independent Study, Department of Aerospace Engineering Sciences, University of Colorado, Boulder.

Fall 2016 **Katherine Smith**, *Ocean Turbulence*, MCEN 6898: Independent Study, Department of Mechanical Engineering, University of Colorado, Boulder.

Spring 2014 **Michelle Burns**, *Experimental Fluid Mechanics*, MCEN 5898: Independent Study, Department of Mechanical Engineering, University of Colorado, Boulder.

Summer 2013 **Joel Berger**, *Introduction to Turbulent Combustion*, MCEN 5898: Independent Study, Department of Mechanical Engineering, University of Colorado, Boulder.

Spring 2013 **Mark Hinaman**, *Introduction to Reservoir Engineering*, MCEN 5898: Independent Study, Department of Mechanical Engineering, University of Colorado, Boulder.

Undergraduate Teaching

Undergraduate Lecture-Based Courses

Fall 2016 **MCEN 3021: Fluid Mechanics**, Professor, Department of Mechanical Engineering, University of Colorado, Boulder.
142 students, FCQ Course Overall: 4.5, FCQ Instructor Overall: 5.0

Fall 2014 **MCEN 3021: Fluid Mechanics**, Professor, Department of Mechanical Engineering, University of Colorado, Boulder.
82 students, FCQ Course Overall: 4.6, FCQ Instructor Overall: 4.9

Undergraduate Independent Study Supervision

Fall 2018   **Sam Simons-Wellin**, *Computational Fluid Dynamics*, MCEN 4848: Independent Study, Department of Mechanical Engineering, University of Colorado, Boulder.

Spring 2017   **Phillip Velasquez**, *Computational Fluid Dynamics*, MCEN 4848: Independent Study, Department of Mechanical Engineering, University of Colorado, Boulder.

Spring 2016   **Lillian Herrick-Reynolds**, *Combustion*, MCEN 4848: Independent Study, Department of Mechanical Engineering, University of Colorado, Boulder.

Teaching Grants

2016   **Center for Research and Education in Wind**, *Optimization with Application to Wind Plant Design*, Short Course, 7 students, Co-PI: Katherine Dykes (NREL), Total: $2,000 (Hamlington share: $2,000).

Peer-Review Service

Proposal Reviews

2019   **Review Panel**, NSF Combustion and Fire Sciences Program, 27 June 2019, Virtual.

2017   **Review Panel**, University of Colorado Innovative Seed Grant Program, 23 March, 2017.

2017   **Review Panel**, NSF Combustion and Fire Sciences Program, 9-10 January 2017, Arlington, VA.

2016   **Review Panel**, University of Colorado Innovative Seed Grant Program, 12 March, 2016.

2012–2018   **Invited Reviewer**, National Science Foundation: Physical Oceanography.

2016   **Invited Reviewer**, DoE Office of Science: Advanced Scientific Computing Research.

Journal Reviews (Current average: 1-2 per month)

- *Aerospace Science and Technology*
- *Combustion and Flame*
- *Combustion Science and Technology*
- *Combustion Theory and Modelling*
- *European Journal of Fluid Mechanics*
- *Flow, Turbulence and Combustion*
- *Geophysical Research Letters*
- *International Journal of Heat and Fluid Flow*
- *Journal of Aircraft*
- *Journal of Fire Sciences*
- *Journal of Fluid Mechanics*
- *Journal of Fluids and Structures*
- *Limnology and Oceanography: Methods*
- *Ocean Modelling*
- *Physica D*
- *Physics of Fluids*
- *Physical Review E*
- *Physical Review Fluids*
- *Physical Review Letters*
- *Proceedings of the Combustion Institute*
- *Wind Energy*

Professional Service

Professional Society Service

2019-Present   **Member**, Western States Section of the Combustion Institute Executive Board.

Professional Conference and Workshop Organization

2018   **Co-Organizer**, Workshop on Highly Turbulent Combustion (sponsored by AFOSR), 6-7 January 2018, Orlando, FL.

2017   **Conference Co-Chair**, 70th Annual Meeting of the APS Division of Fluid Dynamics, 19-21 November 2017, Denver, CO.

2017   **Co-Organizer**, Abstract sorting, 70th Annual Meeting of the APS Division of Fluid Dynamics, 8-10 August 2017, Boulder, CO.

2017   **Co-Organizer**, Workshop on the Structure and Dynamics of Highly Turbulent Combustion (sponsored by AFOSR), 5-6 June 2017, Ballston, VA.

2016   **Organizer**, Rocky Mountain Turbulent Combustion Workshop (sponsored by AFOSR), 9-11 September 2016, Boulder, CO.

2016   **Participant**, Abstract sorting, 69th Annual Meeting of the APS Division of Fluid Dynamics, 20-22 November 2016, Portland, OR.

2014   **Member of Advisory Panel and Session Chair**, 2nd Symposium on OpenFOAM in Wind Energy, 19-21 May 2014, Boulder, CO.

Professional Conference Session Chairing

2019 **Session chair**, *Turbulent Flames*, 72nd Annual Meeting, Division of Fluid Dynamics, American Physical Society, 23-26 November 2019, Seattle, WA.

2019 **Co-organizer and Co-Chair**, *Mini-Symposium: Progress and Challenges in Predictive Modeling of Fires*, 17th International Conference on Numerical Combustion, 6-8 May 2019, Aachen, Germany.

2018 **Co-organizer and Co-Chair**, *Mini-Symposium: Prediction of Highly Turbulent Premixed Combustion in LES Frameworks*, 71st Annual Meeting, Division of Fluid Dynamics, American Physical Society, 18-20 November 2018, Atlanta, GA.

2018 **Session chair**, *Detonations and Explosions*, 71st Annual Meeting, Division of Fluid Dynamics, American Physical Society, 18-20 November 2018, Atlanta, GA.

2017 **Co-Convener and Co-Chair**, Session: "Wildfire Risks Under Climate Change in Coupled Human and Natural Systems Across Scales I", AGU Fall Meeting, 11-15 December, 2017, New Orleans, LA.

2016 **Session chair**, *Reacting Flows: Theory and Analysis*, 69th Annual meeting, Division of Fluid Dynamics, American Physical Society, 20-22 November 2016, Portland, OR.

2015 **Session chair**, *Turbulence Modeling I*, 53rd AIAA Aerospace Sciences Meeting, 5-9 January 2015, Kissimmee, FL.

2014 **Session chair**, *Stratified and Premixed Flames*, 67th Annual meeting, Division of Fluid Dynamics, American Physical Society, 23-25 November 2014, San Francisco, CA.

2014 **Session chair**, *Detonations and Supersonic Combustion*, 44th AIAA Fluid Dynamics Conference, 16-20 June 2014, Atlanta, GA.

2012 **Session co-chair**, *Physics and Biogeochemisty of Submesoscale Processes III Posters*, American Geophysical Union Fall Meeting, 3-7 December 2012, San Francisco, CA.

2012 **Session chair**, *Vortex IV*, 65th Annual meeting, Division of Fluid Dynamics, American Physical Society, 18-20 November 2012, San Diego, CA.

Local Conference and Seminar Organization

2013–Present **Organizer and Founder**, *Boulder Fluid and Thermal Sciences Seminar Series*, University of Colorado, Boulder, CO.

2019 **Co-Organizer**, 5th Annual Rocky Mountain Fluid Mechanics Research Symposium, 29 July 2019, Boulder, CO.

2018 **Co-Organizer**, 4th Annual Rocky Mountain Fluid Mechanics Research Symposium, 13-14 August 2018, Boulder, CO.

2017 **Co-Organizer**, 3rd Annual Rocky Mountain Fluid Mechanics Research Symposium, 11 August 2017, Boulder, CO.

2016 **Co-Organizer**, 2nd Annual Rocky Mountain Fluid Mechanics Research Symposium, 9 August 2016, Boulder, CO.

2015 **Co-Organizer**, 1st Annual Rocky Mountain Fluid Mechanics Research Symposium, 4 August 2015, Boulder, CO.

2015 **Co-Chair**, Graduate Engineering Annual Research and Recruiting Symposium (GEAR^{2}S).

2014 **Co-Chair**, Graduate Engineering Annual Research and Recruiting Symposium (GEAR^{2}S).

Workshop and Summer Program Participation

2019 **Participant**, Early Career Investigator Workshop, 23-24 March 2019, Pasadena, CA.

2018 **Panelist**, Workshop on Turbulent Combustion (sponsored by AFOSR), 29 August 2018, Ballston, VA.

2017 **Participant**, Future of Combustion Workshop, 22-23 April 2017, College Park, MD.

2014 **Participant**, *Center for Turbulence Research Summer Program*, Stanford University, July 2014.

Faculty Committee Service

2018–Present **Chair, Graduate program**, Department of Mechanical Engineering, University of Colorado, Boulder.

2018–2019 **Faculty search committee**, *Hypersonics*, College of Engineering, University of Colorado, Boulder.

2017–2018 **Undergraduate committee**, Department of Mechanical Engineering, University of Colorado, Boulder.

2017–2018 **Faculty search committee**, *Thermal-Fluid Sciences*, College of Engineering, University of Colorado, Boulder.

2016–2017	**Faculty search committee**, Department of Mechanical Engineering, University of Colorado, Boulder.
2016–2017	**Undergraduate committee**, Department of Mechanical Engineering, University of Colorado, Boulder.
Summer 2016	**Instructor pathway committee**, Department of Mechanical Engineering, University of Colorado, Boulder.
2015–2016	**Graduate committee**, Department of Mechanical Engineering, University of Colorado, Boulder.
2015–2016	**Faculty search committee**, Department of Mechanical Engineering, University of Colorado, Boulder.
2014–2015	**Graduate committee**, Department of Mechanical Engineering, University of Colorado, Boulder.
2013–2014	**Graduate committee**, Department of Mechanical Engineering, University of Colorado, Boulder.
2012–2013	**Graduate committee**, Department of Mechanical Engineering, University of Colorado, Boulder.

Dissertation Committee Service

Ph.D. Committee: Completed

2012	**Reckinger, S.**, Ph.D. Committee, Department of Mechanical Engineering, University of Colorado, Boulder. Advisor: Oleg Vasilyev, Defense: November 2012
2013	**Westfall, J.**, Ph.D. Committee, Department of Aerospace Engineering Sciences, University of Colorado, Boulder. Advisor: Kurt Maute, Defense: August 2013
2013	**Soltys, M.**, Ph.D. Committee, Department of Civil, Environmental and Architectural Engineering, University of Colorado, Boulder. Advisor: John Crimaldi, Defense: November 2013
2014	**McCaffrey, K.**, Ph.D. Committee, Department of Atmospheric and Oceanic Sciences, University of Colorado, Boulder. Advisor: Baylor Fox-Kemper, Defense: May 2014
2014	**Guan, Q.**, Ph.D. Committee, Department of Mechanical Engineering, University of Colorado, Boulder. Advisor: John Daily, Defense: July 2014
2015	**Haney, S.**, Ph.D. Committee, Department of Atmospheric and Oceanic Sciences, University of Colorado, Boulder. Advisor: Baylor Fox-Kemper, Comprehensive Exam: August 2012, Defense: January 2015
2015	**Shoaei, F.**, Ph.D. Committee, Department of Civil, Environmental and Architectural Engineering, University of Colorado, Boulder. Advisor: John Crimaldi, Comprehensive Exam: December 2013, Defense: April 2015
2015	**Vanderwende, B.**, Ph.D. Committee, Department of Atmospheric and Oceanic Sciences, University of Colorado, Boulder. Advisor: Julie Lundquist, Defense: April 2015
2015	**Turner, M.**, Ph.D. Committee, Department of Mechanical Engineering, University of Colorado, Boulder. Advisor: Daven Henze, Comprehensive Exam: January 2014, Defense: July 2015
2015	**Boyle, L.**, Ph.D. Committee, Department of Mechanical Engineering, University of Colorado, Boulder. Advisor: Mike Hannigan, Comprehensive Exam: April 2014, Defense: July 2015
2016	**Kasimov, N.**, Ph.D. Committee, Department of Mechanical Engineering, University of Colorado, Boulder. Advisor: Oleg Vasilyev, Comprehensive Exam: May 2014, Defense: January 2016
2016	**Brown-Dymkoski, E.**, Ph.D. Committee, Department of Mechanical Engineering, University of Colorado, Boulder. Advisor: Oleg Vasilyev, Comprehensive Exam: November 2014, Defense: April 2016
2016	**Purser, M.**, Ph.D. Committee, Department of Aerospace Engineering Sciences, University of Colorado, Boulder. Advisor: Kenneth Jansen, Comprehensive Exam: November 2014, Defense: April 2016
2016	**Woolwine, K.**, Ph.D. Committee, Department of Aerospace Engineering Sciences, University of Colorado, Boulder. Advisor: Kenneth Jansen, Comprehensive Exam: April 2015, Defense: April 2016

2016   **Villanueva, C.H.**, Ph.D. Committee, Department of Mechanical Engineering, University of Colorado, Boulder.
Advisor: Kurt Maute, Comprehensive Exam: January 2015, Defense: May 2016

2016   **Walter, S.**, Ph.D. Committee, Department of Aerospace Engineering Sciences, University of Colorado, Boulder.
Advisor: Ryan Starkey, Comprehensive Exam: November 2014, Defense: May 2016

2016   **Pratt, K.**, Ph.D. Committee, Department of Civil, Environmental and Architectural Engineering, University of Colorado, Boulder.
Advisor: John Crimaldi, Comprehensive Exam: December 2014, Defense: October 2016

2016   **Guerrette, J.J.**, Ph.D. Committee, Department of Mechanical Engineering, University of Colorado, Boulder.
Advisor: Daven Henze, Defense: November 2016

2017   **Elliott, W.**, Ph.D. Committee, Department of Mechanical Engineering, University of Colorado, Boulder.
Advisor: Wei Tan, Comprehensive Exam: January 2016, Defense: January 2017

2017   **St. Martin, C.**, Ph.D. Committee, Department of Atmospheric and Oceanic Sciences, University of Colorado, Boulder.
Advisor: Julie Lundquist, Comprehensive Exam: May 2015, Defense: January 2017

2017   **Schroeder, P.**, Ph.D. Committee, Department of Mechanical Engineering, University of Colorado, Boulder.
Advisor: Greg Rieker, Comprehensive Exam: May 2016, Defense: May 2017

2017   **Laurence, R.**, Ph.D. Committee, Department of Aerospace Engineering Sciences, University of Colorado, Boulder.
Advisor: Brian Argrow, Comprehensive Exam: December 2015, Defense: July 2017

2017   **Coley, C.**, Ph.D. Committee, Department of Aerospace Engineering Sciences, University of Colorado, Boulder.
Advisor: John Evans, Comprehensive Exam: December 2016, Defense: July 2017

2017   **Worsnop, R.**, Ph.D. Committee, Department of Atmospheric and Oceanic Sciences, University of Colorado, Boulder.
Advisor: Julie Lundquist, Comprehensive Exam: August 2015, Defense: December 2017

2018   **Lee, J.**, Ph.D. Committee, Department of Atmospheric and Oceanic Sciences, University of Colorado, Boulder.
Advisor: Julie Lundquist, Comprehensive Exam: November 2015, Defense: January 2018

2018   **Engvall, L.**, Ph.D. Committee, Department of Mechanical Engineering, University of Colorado, Boulder.
Advisor: John Evans, Comprehensive Exam: April 2017, Defense: April 2018

2018   **Culler, E.**, Ph.D. Committee, Department of Aerospace Engineering Sciences, University of Colorado, Boulder.
Advisor: John Farnsworth, Comprehensive Exam: April 2017, Defense: May 2018

2018   **Hayden, T.**, Ph.D. Committee, Department of Mechanical Engineering, University of Colorado, Boulder.
Advisor: Greg Rieker, Comprehensive Exam: August 2017, Defense: May 2018

2018   **Plumley, M.**, Ph.D. Committee, Department of Applied Math, University of Colorado, Boulder.
Advisor: Keith Julien, Comprehensive Exam: November 2016, Defense: February 2018

2018   **Nsanzineza, R.**, Ph.D. Committee, Department of Mechanical Engineering, University of Colorado, Boulder.
Advisor: Jana Milford, Comprehensive Exam: October 2017, Defense: October 2018

2019   **Mazzaro, L.**, Ph.D. Committee, Department of Atmospheric and Oceanic Sciences, University of Colorado, Boulder.
Advisor: Julie Lundquist, Comprehensive Exam: November 2016, Defense: January 2019

2019   **Campbell, N.**, Ph.D. Committee, Department of Aerospace Engineering Sciences, University of Colorado, Boulder.
Advisor: Brian Argrow, Comprehensive Exam: May 2017, Defense: April 2019

2019 **Makowiecki, A.**, Ph.D. Committee, Department of Mechanical Engineering, University of Colorado, Boulder.
Advisor: Greg Rieker, Comprehensive Exam: February 2019, Defense: December 2019

2019 **Tomaszewski, J.**, Ph.D. Committee, Department of Atmospheric and Oceanic Sciences, University of Colorado, Boulder.
Advisor: Julie Lundquist, Comprehensive Exam: April 2017, Defense: May 2020

Ph.D. Committee: Ongoing

2019 **Skinner, R.**, Ph.D. Committee, Department of Aerospace Engineering Sciences, University of Colorado, Boulder.
Advisor: Kenneth Jansen, Comprehensive Exam: January 2018

2019 **Balin, R.**, Ph.D. Committee, Department of Aerospace Engineering Sciences, University of Colorado, Boulder.
Advisor: Kenneth Jansen, Comprehensive Exam: December 2018

2019 **Connor, E.**, Ph.D. Committee, Department of Civil, Environmental and Architectural Engineering, University of Colorado, Boulder.
Advisor: John Crimaldi, Comprehensive Exam: December 2018

2019 **Straccia, J.**, Ph.D. Committee, Department of Aerospace Engineering Sciences, University of Colorado, Boulder.
Advisor: John Farnsworth, Comprehensive Exam: March 2019

Ph.D. Committee: External

2018 **Antonini, E.**, External Thesis Reviewer, Department of Mechanical and Industrial Engineering, University of Toronto.
Advisor: Cristina Amon, Defense: September 2018

2018 **Paes, P.**, Ph.D. Committee, Department of Mechanical Engineering, Pennsylvania State University.
Advisor: Yuan Xuan, Defense: December 2018

2019 **Kshitij, A.**, Ph.D. Committee, Department of Aerospace and Mechanical Engineering, Arizona State University.
Advisor: Werner Dahm, Preliminary Exam: March 2017, Comprehensive Exam: October 2018

2020 **Stallcup, E.**, Ph.D. Committee, Department of Aerospace and Mechanical Engineering, Arizona State University.
Advisor: Werner Dahm, Preliminary Exam: November 2018

2021 **Torres, E.**, Ph.D. Committee, Department of Aerospace and Mechanical Engineering, Arizona State University.
Advisor: Werner Dahm, Preliminary Exam: April 2019

M.S. Committee: Completed

2013 **Masson, N.**, M.S. Thesis Committee, Department of Mechanical Engineering, University of Colorado, Boulder.
Advisor: Mike Hannigan, Defense: November 2013

2014 **Mati, N.**, M.S. Thesis Committee, Department of Aerospace Engineering Sciences, University of Colorado, Boulder.
Advisor: Kenneth Jansen, Defense: July 2014

2015 **Shervanitabar, N.**, M.S. Thesis Committee, Department of Mechanical Engineering, University of Colorado, Boulder.
Advisor: Oleg Vasilyev, Defense: December 2015

2017 **Farr, M.**, M.S. Thesis Committee, Department of Mechanical Engineering, University of Colorado, Boulder.
Advisor: Alireza Doostan, Defense: January 2017

2017 **Cameron, D.**, M.S. Thesis Committee, Department of Mechanical Engineering, University of Colorado, Boulder.
Advisor: John Daily, Defense: November 2017

2019   **Hanley, M.**, M.S. Thesis Committee, Department of Mechanical Engineering, University of Colorado, Boulder.
Advisor: Shalom Ruben Defense: May 2019

2020   **Tong, G.**, M.S. Thesis Committee, Department of Mechanical Engineering, University of Colorado, Boulder.
Advisor: John Evans, Defense: April 2020

Outreach

2017   **Public lecture**, *Wind Energy in a Turbulent World*, CU on the Weekend, Boulder, CO, December 9, 2017.

2016   **Mentor**, *Summer Multicultural Access to Research Training (SMART) Program*, University of Colorado, Boulder, Student: Skyler Kern.

2016   **Public lecture**, *The Most Important Unsolved Problem of Classical Physics*, Café Scientifique, Denver, CO, March 22, 2016.

2015–2016   **Mentor**, *Discovery Learning Apprenticeship (DLA) Program*, University of Colorado, Boulder, Student: Shelby Mason.

2015   **Mentor**, *Undergraduate Research Opportunities Program (UROP)*, University of Colorado, Boulder, Student: Trevor Roberts.

2015   **Mentor**, *Summer Multicultural Access to Research Training (SMART) Program*, University of Colorado, Boulder, Student: Monique McClain.

2015   **Mentor**, *Balsells International Mobility Program*, University of Colorado, Boulder, Student: David Iglesias.

2013–2014   **Mentor**, *Discovery Learning Apprenticeship (DLA) Program*, University of Colorado, Boulder, Student: Sean Collins.

2012   **Mentor**, *UCAR Significant Opportunities in Atmospheric Research and Science (SOARS) program*, Student: Ana Ordonez.

2012   **Co-Instructor**, *Climate Science Education for Under-represented Students Through Collaboration with CABPES (Colorado Association of Black Professional Engineers and Scientists)*, NASA ROSES proposal educational supplement, PI: Robert Leben.